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Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

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Making Sustainability Happen

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Basis of Report

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1.0 Introduction

1.1 **Project Overview**

The project comprises a 110kV electricity substation; including all associated development works to accommodate its construction, operation, maintenance and the export of electricity to the national grid via the existing Athlone-Lanesborough overhead electricity transmission line; and c. 7.5 km of underground electricity line.

A full description of the project is provided in sections 3.2.1 and 5.1.1.

1.2 Relevant Legislation

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) requires all Member States to establish a strict protection regime for species listed in Annex IV, both inside and outside European sites and forms the basis for the designation of Special Areas of Conservation (SACs) and a precursor designation for Sites of Community Interest (SCI). Similarly, Special Protection Areas (SPAs) are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). Collectively, SACs, SCIs and SPAs are referred to as European sites. The European Sites Network is the minimum required to conserve certain habitats and species which are listed in the Directives.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment (AA) must be undertaken for any plan or project that is not directly connected with or necessary to the management of a Natura 2000 site but is likely to have a significant effect thereon, either individually or in combination with other plans or projects. An AA is an evaluation of the potential adverse effect of a plan or project alone or in combination with any other plan or project on the conservation objectives and therefore integrity of a European site, and the identification, where necessary, of mitigation or avoidance measures to preclude adverse effects on the integrity of the site.

Article 6, paragraph 3 of the European Commission (EC) Habitats Directive 92/43/EEC ("the Habitats Directive") as defined above states that:

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

1.2.1 Planning and Development Act 2000 (as amended)

These processes have been further enshrined in the Planning and Development Act 2000 (as amended), in sections 177T, 177U and 177V, which are as follows:

- s177T(1)(b) A Natura impact statement means 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.
- (2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall 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.

- 177U. (1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.
- (4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.
- s177U(5): The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is not required if it can be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.
- 177V. (1) An appropriate assessment carried out under this Part 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 and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before ... (b) consent is given for the proposed development.
- 177V. (2) In carrying out an appropriate assessment under subsection (1) the competent authority shall 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; (g) any other relevant information.

1.3 **Purpose of Report**

The purpose of this Natura Impact Statement (NIS) is to provide the information for the competent authority, in this case An Bord Pleanála, to carry out a screening assessment and, if applicable, an Appropriate Assessment (AA) of the project, in accordance with and fulfilment of the requirements of Article 6 of the Habitats Directive.

1.4 Statement of Authority

1.4.1 Andrew Torsney

This NIS has been reviewed by Andrew Torsney BSc, MRes, PhD, ACIEEM. Andrew has undertaken Appropriate Assessments for a number of national regional and local plans as well as project level assessments. Andrew is a technical specialist in AA processes and has undertaken review processes for competent authorities such as the Department of Public Expenditure and Reform and several County Councils such as Dun Laoghaire Rathdown



and Kilkenny. Andrew has also delivered training on the role of county councils in the AA process as well as having authored NIS reports for a variety of project types.

1.4.2 Jonathon Dunn

This NIS has been written by Jonathon Dunn MA (Cantab.), MSc, PhD, MCIEEM. Jonathon also undertook extended habitat surveys and managed the bird survey component of the project. He has worked in the environmental sector since 2014 and joined SLR Environmental Consulting (Ireland) Ltd in 2021. Jonathon has undertaken a wide variety of ecological surveys for many different types of projects and has written multiple types of reports including NIS reports.

1.4.3 Bird Surveyors

Details of bird surveyors are contained within Appendix B.

1.4.4 Aquatic Surveyors

Details of aquatic ecology surveyors are contained within Appendix C.

2.0 Background Context

2.1 General Approach

The methodology used in this report is based on and in accordance with guidance provided by the National Parks and Wildlife Service (NPWS, 2010), the Office of the Planning Regulator (OPR, 2021) and EC Guidance (EC, 2018) (EC, 2020) (EC, 2021) on the application of Article 6 of the Habitats Directive. The 2021 EC guidance describes a series of stages and steps which should be completed when carrying out the assessment and these are followed here with the addition of sub-headings for further clarity. The assessment applies only to European sites. More specifically, it only applies to the qualifying interest (QI) features of such sites i.e., the features which are the reason that the site was designated. Note that QIs have also been used to refer to special conservation interest (SCIs) for SPAs to avoid confusion with the same abbreviation for sites of community interest (also SCIs).

2.2 Stage 1: Screening

The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on European sites in view of the site's conservation objectives.

There is no necessity to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of Appropriate Assessment (AA) has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether a Stage Two AA must be undertaken by the competent authority on the implications of the project on the conservation objectives of a European site. Therefore, where significant effects are likely, uncertain or unknown at screening stage, a second stage AA will be required.

2.3 Stage 2: Appropriate Assessment

A Stage Two AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority of the implications of the plan or project, alone and incombination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an Appropriate Assessment, to be lawfully conducted, in summary: (i) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed project which can, by itself or incombination with other plans or projects, affect the conservation objectives of the European site; (ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and (iii) may only include a determination that the proposed project will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to stage three and, if necessary, stage four.

2.3.1 Sources of Information

Sources of information for the assessment of the project 'alone' include:

- Energia Renewables ROI Limited (2024) Moyvannan Electricity Substation Environmental Impact Assessment Report (Energia Renewables ROI Limited, 2024);
- SLR (2024) Moyvannan Bird Survey Report Non-Breeding Season 2023-24 (SLR, 2024) (Appendix B);
- Triturus Environmental Ltd (2024) Aquatic ecological assessment of the Cross River, northwest of Athlone, Co. Roscommon (Triturus, 2024) (**Appendix C**); and
- Site Synopses, Conservation Objectives and Standard Data Forms for European Sites¹.

Sources of information for the plans and projects considered for the "in combination" assessment were as above and included:

- National Planning Database; Department of Housing, Local Government and Heritage; Available at https://data.gov.ie/dataset/national-planning-applications;
- Energia Renewables ROI Limited (2024) Moyvannan Electricity Substation Environmental Impact Assessment Report (Energia Renewables ROI Limited, 2024);
- Energia Renewables ROI Limited (2022) Proposed Seven Hills Wind Farm, Co. Roscommon. Natura Impact Statement (Energia Reneables ROI Limited, 2022);
- Roscommon County Development Plan 2022-2028 (Roscommon County Council, 2022);
- Westmeath County Development Plan 2021-2027 (Westmeath County Council, 2021);
- National Biodiversity Action Plan (NPWS, 2023); and
- Northern and Western Regional Spatial and Economic Strategy 2020-2032 (RSES) (Government of Ireland, 2020).

2.4 Consultations

The scope for this assessment has also been informed by consultation with statutory consultees and other bodies with environmental responsibility.

Issues, matters and recommendations highlighted by the responses in relation to ecology are summarised in **Table 2.1** below. Responses have been abridged where required.

¹ <u>https://www.npws.ie/protected-sites</u> [last accessed 06/11/2024]

Table 2.1: Consultation Comments

Consultee	Date of Consultation Comment	Consultee Comments		
Developments Application Unit (DAU)	26 March 2024	This Department notes the preliminary EIA scoping report that has been produced by Galetech Energy Services. We recommend that the potential cumulative impacts of the proposed development along with those of the permitted Seven Hills Wind Farm (An Bord Pleanála Ref. ABP-313750-22) and the proposed Eirgrid Athlone to Lanesborough 110 kV line upgrade should be evaluated. We further note that the proposed development is in fact part of the infrastructure of the permitted Seven Hills Wind Farm (An Bord Pleanála Ref. ABP-313750-22), that the proposed electricity substation and cables should have formed part of the planning application for the permitted Seven Hills Wind Farm and that the failure to have done so constitutes a lacuna in the planning process for the permitted Seven Hills Wind Farm (as in O'Grianna & Ors. V. An Bord Pleanála ([2016] IEHC 632)).		
Department of Agriculture, Forestry and the Marine (DAFM)	26 March 2024	If the proposed development will involve the felling or removal of any trees, the developer must obtain a Felling Licence from this Department before trees are felled or removed.		
		The developer should take note of the contents of the Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling; gov.ie-Tree Felling Licences (<u>www.gov.ie</u>). As this development is within forest lands, particular attention should be paid to deforestation, turbulence felling and the requirement to afforest alternative lands.		
		It is important to note that when applying to a Local Authority, or An Bord Pleanàla, for planning permission where developments are:		
		a) subject to an EIA procedure (including screening in the case of a sub-threshold development) and any resulting requirement to produce an EIAR; and/or		
		b) subject to an Appropriate Assessment procedure (including screening) and any resulting requirement to a Natura Impact Statement (NIS); and		
		c) the proposed development in its construction or operational phases, or any works ancillary thereto, would directly or indirectly involve the felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species,		

Consultee	Date of Consultation Comment	Consultee Comments		
		1.that there is a requirement inter alia under the EIA Directive for an overall assessment of the effects of the project or the alteration thereof on the environment to be undertaken, including the direct and indirect environmental impact of the project; and		
		2.pursuant to Article 2(3) of the EIA Directive, the Department of Agriculture, Food and the Marine strongly recommends that, notwithstanding the fact that a parallel consent in the form of felling licence may also have to be applied for, any EIAR and/or NIS produced in connection with the application for planning permission to the Local Planning Authority or An Bord Pleanàla, should include an assessment of the impact of and measures, as appropriate, to prevent, mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from such felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species.		
		3.Please note that there must be absolute spatial consistency between the felling licence areas submitted to DAFM (second authority) and all related planning documents submitted to the first authority in respect of the felling area(s).		
Irish Wildlife Trust (IWT)	27 February 2024	We do not have the staff capacity to be respond to this consultation at the moment but we will endeavour to respond if possible.		

3.0 Stage 1: Screening

3.1 Management of European Sites

The project includes the construction and operation² of an electricity substation, underground electricity line and ancillary infrastructure. Therefore, it is not connected with, or necessary for, the management of any European site.

3.2 Brief Project Description

3.2.1 The Project

The project comprises the following main components:

- A 110 kV 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electricity substation, including a single-storey control building (with a Gross Floor Area of 450 m²); busbars, insulators, cable sealing ends, and lightning poles within a secure compound (with a total footprint of of approximately 8,500 m²);
- Replacement of 1 no. existing wooden pole-set with 2 no. lattice-type interface masts, each of which will be between 16 m and 18 m in height, to facilitate connection of the electricity substation to the existing Athlone-Lanesborough 110kV overhead electricity transmission line;
- Approximately 270 m of 110kV underground electricity line between the electricity substation and the interface masts;
- Approximately 630 m of on-site access tracks with associated upgrade works to an existing agricultural entrance from the L7551;
- Approximately 7.5 km of 110kV underground electricity line between the electricity substation and the junction of the L7636 local road and R363 regional road where the electricity line will connect to grid connection infrastructure permitted as part of the Seven Hills Wind Farm (An Bord Pleanála Reference ABP-313750-22). The electricity line will be placed within private lands and within the carriageways of the L7551, L7556, L2018, L7731, R362, L2023, and L7636; and
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works including a temporary construction compound and the provision of site drainage infrastructure and surface water protection measures.

3.2.2 Receiving Environment

3.2.2.1 Habitats

The dominant habitats within the proposed substation location are improved agricultural grassland, with some stone walls and hedgerows present also.

The proposed electricity line route will be located almost entirely within existing roads. Bounding habitats include grassy verges, hedgerows, treelines, scrub, stone walls, buildings, amenity grassland and flower beds.

² While the primary function of the project is to facilitate the connection of the Seven Hills Wind Farm to the national electricity grid; the project will, once operational, be operated and maintained by EirGrid as part of the national electricity network. As a result, it is highly likely that the project will continue to operate following the decommissioning of the Seven Hills Wind Farm and, therefore, decommissioning of the project is not proposed.



No Annex I habitats were recorded within the project site; however, there are Annex I turlough habitats present to the south and southwest of the proposed electricity substation.

3.2.2.2 Species

A range of ecological surveys were undertaken between 19 October 2023 and 22 May 2024 following best practice guidelines. Refer to **Table 5.3** for details.

An overview is provided below for any QI birds, birds listed under Annex I of the Birds Directive, plants and animals listed under Annexes II and IV of the Habitats Directive, and invasive or non-native species (INNS) recorded during ecological surveys (**Table 3.1**).

A 500 m survey buffer was adopted for non-breeding bird surveys along the electricity line route and at the proposed substation location. Details of the rationale for the survey area are contained within **Appendix B**. Non-breeding bird surveys were completed prior to the finalisation of the project design process and so a separate but comparable electricity line route was surveyed. Some but not all the surveyed route overlaps with the proposed electricity line route.

The project is shown in Figure 1 within **Appendix A**. There are several turloughs near the project, specifically the proposed substation; the two closest and largest turloughs to the south and southwest of the proposed substation are labelled within Figure 1 as 'southern turlough' and 'southwestern turlough'. Collectively, these are referred to as 'the turloughs'.

Species	Record Details
Black-headed gull Chroicocephalus ridibundus	Black-headed gull were recorded both during most survey months in the winter and also during the extended habitat survey in May 2024. They were most frequently recorded on the turloughs south-west of the proposed substation location.
Eurasian coot <i>Fulica atra</i>	Eurasian coot were recorded in February and March 2024 only, across turloughs within the 500 m survey buffer of the proposed substation location. Breeding coot were recorded in the buffer along the electricity line route and at the turloughs in the 2024 breeding season.
Eurasian teal Anas crecca	Eurasian teal were frequently recorded across the winter survey period mainly within the turloughs south-west and approximately 450 m from the proposed substation location.
Eurasian wigeon <i>Mareca penelope</i>	Eurasian wigeon were recorded during the winter surveys from November 2023 to March 2024. The highest concentration of this species was observed within the turloughs south-west of the proposed substation location, with smaller flocks of Eurasian wigeon within other turloughs within the 500 m survey buffer along the route of the underground electricity line.
Little egret <i>Egretta</i> garzetta	This species was recorded in the turloughs (southwest turlough) during the May 2024 extended habitat survey (single bird).
Little grebe Tachybaptus ruficollis	Little grebe observations were made in February and March 2024, with a peak count of two birds recorded. This species was recorded within the turloughs south / south-west of the proposed substation location, and within a pond within the buffer along the route of the electricity line.

Table 3.1 QI, SCI and Invasive Species Identified within the Receiving Environment of the Project Site

Species	Record Details
Mallard Anas platyrhynchos	Mallard observations were confined to the turloughs south of the proposed substation location. Mallards were recorded in all winter months except November 2023. A pair were seen in the southwestern turlough and a few single mallards were seen in the southern turlough during the extended habitat survey in May 2024.
Northern lapwing <i>Vanellus vanellus</i>	Winter observations of northern lapwing were made in the months of October 2023 to February 2024. The highest concentrations of lapwing were observed repeatedly on the turloughs south / south- west of the proposed substation location. Smaller flocks were observed foraging in improved agricultural grasslands along the route of the underground electricity line. This species was also heard near the turloughs south of proposed substation location during the project scoping visit in October 2023.
Tufted duck <i>Aythya</i> <i>fuligula</i>	All winter observations of tufted duck were within the turloughs south/south-west of the proposed substation location. Tufted ducks were recorded in February and March 2024 and a peak count of eight birds was recorded in February 2024. No breeding tufted duck were detected during the extended habitat survey in May 2024.
Whooper swan <i>Cygnus cygnus</i>	Whooper swan were recorded during three of the twelve winter feeding distribution surveys. All whooper swan observations were exclusive to the turloughs south/south-west of the proposed substation location.
Otter <i>Lutra lutra</i>	No otter holts, couches or signs were recorded within 150 m of the proposed crossing of the Cross River. Two spraints were recorded 2.8 km downstream and the area is considered to offer good foraging and commuting habitat.
Brook lamprey <i>Lampetra planeri</i>	Very strong eDNA signatures were present for brook lamprey 2.8 km downstream of the proposed crossing of the Cross River, with good spawning and moderate quality nursery habitat present. More significant lamprey habitat exists further downstream again.
Box honeysuckle Lonicera nitida	Non-native box honeysuckle was recorded along hedgerows and was adjacent to the crossing of the Cross River (local road L2023).
Montbretia Crocosmia x crocosmiiflora	Non-native montbretia was recorded within verges adjacent to the route of the electricity line (local road L2018).
Japanese knotweed <i>Reynoutria japonia</i>	Japanese knotweed was recorded within a verge adjacent to the proposed electricity line route (local road L7556). This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011).
Snowberry Symphoricarpos albus	Non-native snowberry was recorded within hedgerows adjacent to the proposed electricity line route (local road L7556, and local road L2018).

3.2.2.3 Ecological Connections

A population of a mobile species that is a qualifying interest of a European site could also use habitat within or in the vicinity of a project site. If such a population is sometimes present within a project site, it is ecologically connected to the relevant European site. For example,



ecological connections may include populations of birds, mammals, migratory fish and other species form the QIs of a European site.

Other examples of potential ecological connections include habitat connections either directly or as 'stepping stones'. Also, a project site may support a population of the same species as within a connected European site which occasionally exchange individuals. Furthermore, a project site may support populations of species which are prey/ food or hosts to the QIs of a European site.

3.2.2.4 Hydrological and Hydrogeological Connections

The Cross River intersects the proposed route of the underground electricity line. The Cross River flows into the River Shannon and ultimately, Lough Derg. There is potential hydrological connectivity between any European site located downstream of the Project site.

The project is located within the Funshinagh groundwater body. There is potential hydrogeological connectivity between the project and any European site located within this groundwater body.

3.3 **Potential Impacts**

The potential impacts associated with the construction phase of the Project are:

- Loss of, or damage to, habitats and flora during the construction/removal of infrastructure;
- Accidental spread of INNS, which could alter the suitability of habitats for QI species;
- Loss of habitat and consequent reduction in home ranges of QI species;
- Displacement of QI species;
- Disturbance of Annex I bird species and terrestrial QI species such as lesser horseshoe bats *Rhinolophus hipposideros* and otter as well as their food sources by noise, visual, human disturbance during construction;
- Changes in hydrology or hydrogeology (water quality / quantity); and
- Changes in air quality and dust/particulates due to construction and site traffic.

The potential impacts associated with the operational phase of the Project are:

- Disturbance and displacement of species such as birds, lesser horseshoe bat and otter from the project area the period of operation; and
- Collision of birds and bats with the substation and electrical apparatus.

3.4 Identification of European Sites and Likely Significant Effects

European Sites which may be subject to Likely Significant Effects (LSE) from the project are identified using the 'source-pathway-receptor' (S-P-R) conceptual model. The S-P-R model is a standard tool in environmental assessment to determine links between sensitive features and sources of impacts. For an effect to occur, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism means there is no likelihood for the effect to occur e.g. if there is no ecological pathway or functional link between the project and the European site, there is no potential for impact and as such no potential for significant effects.

An impact may occur without having a significant effect. An impact is essentially the 'source' in the S-P-R assessment. It is the biophysical change caused to the environment by the



project e.g., increase in sediment runoff due to ground disturbance. For the effect to be significant, the QIs of the European site must be sensitive to the biophysical change, and this would undermine the conservation objectives for that QI.

NPWS guidelines (NPWS, 2010) and the Office of the Planning Regulator's Practice Note PN01 (OPR, 2021) suggest that a 15 km study area is adopted, but a case-by-case basis is undertaken when assessing the potential for source-receptor connectivity between a project and European sites.

While an initial 15 km study area was adopted for SACs, a different approach was undertaken for SPAs.

In the absence of any specific European or Irish guidance in relation to establishing ecological connectivity to SPAs, NatureScot guidance (formerly Scottish Natural Heritage or 'SNH') (SNH, 2016) was consulted. This document provides guidance in relation to the identification of ecological connectivity between development sites and SPAs. The guidance takes into consideration the distances species may travel beyond the boundary of relevant SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects. It goes on to state that *"in most cases the core range should be used when determining whether there is connectivity between the proposal and the QIs"*. Where SPAs and developments are separated by a greater distance than the core foraging ranges for the SPAs listed QI species, there is no likely ecological connectivity to the development.

According to NatureScot guidance (SNH, 2016), the core foraging distances of wintering grey geese (greylag goose *Anser anser* and pink-footed goose *Anser brachyrhunchus*) from SPAs is 15-20 km. This represents the largest foraging range of all the species listed in this guidance document recorded in Ireland. It is acknowledged that information on core foraging ranges is not available for all Irish SCI species. In such cases, the 15-20 km core foraging range for grey geese has been adopted as a precautionary approach.

Thus, all SPAs within 20 km from the Project were considered for ecological source-receptor connectivity.

Hydrological connectivity beyond 20 km was also searched for using GIS to identify any European sites downstream of the project connected via watercourses.

Airborne emissions were considered using the approaches outlined in IAQM guidance (IAQM, 2019) (IAQM, 2014), which suggests that air pollution and dust from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively.

European sites considered for potential source-receptor connectivity, along with likely significant effects, are detailed in **Table 3.2**. The locations of these sites, along with hydrological and hydrogeological details, are shown in **Appendix A**, **Figures 2a** to **2d**. below.

Table 3.2: Designated Sites Considered for Screening

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
SACs within 15 k	m				
Ballynamona Bog and Corkip Lough SAC 002339	 Turloughs [3180] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] Bog woodland [91D0] 	 To restore the favourable conservation condition of turloughs, active raised bogs, and bog woodland. The conservation condition of degraded raised bogs still capable of natural regeneration, and depressions on peat substrates of <i>Rhynchosporion</i> are inherently linked to that of active raised bogs and so separate conservation objectives have not been set for these two habitats. 	0.9 km south	 Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Barr's Drain watercourses (instream distance 6.6 km). Potential remote, indirect hydrogeological connection to groundwater dependent terrestrial ecosystem (GWDTE) QI turlough and bog woodland habitats via shared Funshinagh groundwater body. The other QI habitats are typically rainwater fed, and so are not usually dependent on surface water or groundwater from elsewhere. Appendix D shows that there is no groundwater connection between the substation location and SAC, but there could be for the electricity line. While excavation along the electricity line will be shallow, there could be an indirect connection to QI turlough or bog 	Y

³ For SPA avian QIs, information is given on the type of population for which is the QI is designated: r = reproducing, w = wintering, c = concentration and p = permanent.

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				woodland habitats via infiltration / groundwater flow. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Lough Ree SAC 000440	 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Active raised bogs [7110] 	 To maintain the favourable conservation condition of alkaline fens, limestone pavements and otter To restore the favourable conservation condition of natural eutrophic lakes with <i>Magnopotamion or Hydrocharition</i> - type vegetation, semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) and degraded raised bogs still 	1.9 km east	Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper] watercourses (instream distance 17.2 km). Potential remote, indirect hydrogeological connection to groundwater dependent terrestrial ecosystem GWDTE alkaline fen, bog woodland and alluvial forest QI habitats via shared Funshinagh groundwater body.	Y

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Degraded raised bogs still capable of natural regeneration [7120] Alkaline fens [7230] Limestone pavements [8240] Bog woodland [91D0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Otter Lutra lutra [1355] 	capable of natural regeneration, bog woodland. • There are no conservation objectives for active raised bogs or alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus</i> <i>excelsior</i> (<i>Alno-Padion, Alnion</i> <i>incanae, Salicion albae</i>). The conservation objectives supporting document is due to be reviewed and updated shortly (NPWS, 2024).		The other QI habitats are either terrestrial, or are typically rainwater fed, and so are not usually dependent on surface or groundwater from elsewhere. Appendix D shows that there is an indirect groundwater connection between the substation location and electricity line to the SAC via infiltration / groundwater flow. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological Otter were recorded 2.8 km downstream. Maximum otter territories in Ireland are 13.2 km length (Reid, et al., 2013). As this distance is smaller than the instream distance between the project site and SAC, it is unlikely that there is ecological connectivity between the project and the SAC via mobile ex situ otter. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
Lough Funshinagh SAC 000611	 Turloughs [3180] Rivers with muddy banks with <i>Chenopodion rubri</i> p.p. and <i>Bidention</i> p.p. vegetation [3270] 	To maintain the favourable conservation condition of turloughs, and rivers with muddy banks with <i>Chenopodion rubri</i> p.p. and <i>Bidention</i> p.p. vegetation	2 km northwest	 Hydrological and hydrogeological No hydrological connectivity. Potential remote, indirect hydrogeological connection to GWDTE QI turlough habitats via shared Funshinagh groundwater body. The other QI habitat is fed by surface water. Appendix D shows that there is no groundwater connection between the project and SAC, as the project site is downgradient of the SAC. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	N
Castlesampson Esker SAC 001625	 Turloughs [3180] Semi-natural dry grasslands and scrubland facies on calcareous substrates 	To restore the favourable conservation condition of turloughs, and semi-natural dry grasslands and scrubland	3.8 km south	Hydrological and hydrogeological No hydrological connectivity. Appendix D shows that there is a potential hydrogeological connection to	Y



Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	(<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	facies on calcareous substrates (<i>Festuco-Brometalia</i>)		GWDTE QI turlough habitats viashared Funshinagh groundwater body. The other QI habitat is terrestrial. Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Lough Croan Turlough SAC 000610	• Turloughs [3180]	To restore the favourable conservation condition of turloughs.	5.3 km northwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. 	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Killeglan Grassland SAC 002214	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210]	To restore the favourable conservation condition of semi- natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco- Brometalia</i>) (* important orchid sites).	7.2 km southwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	Ν
River Shannon Callows SAC 000216	 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Lowland hay meadows (Alopecurus) 	To maintain the favourable conservation condition of alkaline fens, limestone pavements, alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus</i> <i>excelsior</i> (<i>Alno-Padion, Alnion</i>	8.8 km southeast	Hydrological and hydrogeological Downstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower] (10.1 km instream distance). No hydrogeological connectivity as SAC is in a different groundwater body (Athlone West, Inny, Clara, Tynagh,	Ŷ



Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 pratensis, Sanguisorba officinalis) [6510] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Otter Lutra lutra [1355] 	 incanae, Salicion albae) and otter. To restore the favourable conservation condition of <i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>) and lowland hay meadows (<i>Alopecurus pratensis, Sanguisorba officinalis</i>). 		Aughrim, Banagher) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological Otter were recorded 2.8 km downstream. Maximum otter territories in Ireland are 13.2 km length (Reid, et al., 2013). This distance is greater than the instream distance between the project site and SAC. Therefore, there is potential ecological connectivity via mobile ex situ otter. Taking a precautionary approach, which assumes that the otter signs recorded during the surveys could represent SAC individuals, the potential for disturbance / displacement or water-quality related effects to otter during the construction phases, cannot be ruled out at this stage and requires further consideration. Invasive species Downstream hydrological connectivity provides a potential pathway for the spread of invasive species, such as Japanese knotweed, which was recorded alongside the electricity route.	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
Four Roads Turlough SAC 001637	• Turloughs [3180]	To restore the favourable conservation condition of turloughs.	10.6 km northwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	Ν
Crosswood Bog SAC 002337	 Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] 	 To restore the favourable conservation condition of active raised bogs. The conservation condition of degraded raised bogs still capable of natural regeneration, is inherently linked to that of active raised bogs and so a separate conservation objective has not been set for this habitat. 	12.4 km southeast	Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper] watercourses (instream distance 17.2 km). No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				There is no strong connection for airborne emissions and dust due to distance.	
				No ecological connectivity as the QIs are habitats, which are located outside of the project site.	
				There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Lisduff Turlough SAC 000609	• Turloughs [3180]	To maintain the favourable conservation condition of turloughs.	12.4 km northwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the project of the project site. 	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
Carn Park Bog SAC 002336	 Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] 	 To restore the favourable conservation condition of active raised bogs. The conservation condition of degraded raised bogs still capable of natural regeneration, is inherently linked to that of active raised bogs and so a separate conservation objective has not been set for this habitat. 	14.1 km southeast	 Hydrological and hydrogeological No downstream hydrological connectivity. Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Upper], Breensford and Tullycross watercourses (instream distance 32.5 km). No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	N
Fortwilliam Turlough SAC 000448	Turloughs [3180]	To maintain the favourable conservation condition of turloughs.	14.9 km northeast	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity due to distance and Lough Ree acting as natural barrier. Air	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				There is no strong connection for airborne emissions and dust due to distance. Ecological No ecological connectivity as the QI is a habitat, which is located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
SACs with remote	e downstream hydrologica	I connectivity			
Lough Derg, North-east Shore SAC 002241	 Juniperus communis formations on heaths or calcareous grasslands [5130] Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion, Alnion</i> 	 To maintain the favourable conservation condition of calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>, alkaline fens, and <i>Taxus baccata</i> woods of the British Isles. To restore the favourable conservation condition of <i>Juniperus communis</i> formations on heaths or calcareous grasslands, limestone pavements, and alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae</i>) 	42 km southwest	 Hydrological and hydrogeological Very remote, downstream hydrological connectivity (67 km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance, and project is in different groundwater body to SAC (Funshinagh vs. Nenagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological 	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 incanae, Salicion albae) [91E0] Taxus baccata woods of the British Isles [91J0] 			No ecological connectivity as the QIs are habitats, which are located outside of the project site. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Lower River Shannon SAC 002165	 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] 	 To maintain the favourable conservation condition of sandbanks which are slightly covered by sea water all the time, estuaries, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays, reefs, perennial vegetation of stony banks, vegetated sea cliffs of the Atlantic and Baltic coasts, Salicornia and other annuals colonising mud and sand, water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation, <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>), and bottlenose dolphin. To restore the favourable conservation condition of the favourable conservation condition conservation condition of the favourable conservation condition conservation condition of the favourable conservation condition conservation condition conservation condition conservation condition conservation condition conservation conservation	75 km southwest	 Hydrological and hydrogeological Very remote, downstream hydrological connectivity (104 km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance, and project is in different groundwater body to SAC (Funshinagh vs. large number of other groundwater bodies). Air There is no strong connection for airborne emissions and dust due to distance. Ecological Freshwater pearl mussel are not mobile and were not recorded nearby the project site. The catchment is also not a known pearl mussel catchment (NPWS, 2019). While salmonids can act as hosts for pearl mussel glochidia (NPWS, 2019), the extremely large instream distance 	Ν

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Salicornia and other annuals colonising mud and sand [1310] 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] 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 	coastal lagoons, Atlantic salt meadows (<i>Glauco-</i> <i>Puccinellietalia maritimae</i>), Mediterranean salt meadows (<i>Juncetalia maritimi</i>), Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-</i> <i>Padion, Alnion incanae,</i> <i>Salicion albae</i>), freshwater pearl mussel, sea lamprey, brook lamprey, river lamprey, Atlantic salmon, and otter.		makes it unlikely that any salmonids present near the project site act as hosts for pearl mussel in this SAC. Common dolphin are exclusively marine. Sea and river lamprey, and Atlantic salmon were not recorded during surveys. Therefore, there will be no disturbance/displacement or water- mediated effects for freshwater pearl mussel, common dolphin, sea lamprey, river lamprey and Atlantic salmon. Brook lamprey and otter were recorded 2.8 km downstream. Book lamprey are a non-migratory species and only travel short distances upstream prior to spawning (NPWS, 2019). Thus, the populations near the project site are highly unlikely to be part of the SAC population due to the extremely large instream distance. Maximum otter territories in Ireland are 13.2 km length (Reid, et al., 2013). As this distance is much smaller than the instream distance between the SAC and project site, there is no ecological connectivity via mobile ex situ otters. Invasive species	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 (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] 			There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
SPAs within 20 k	m				
Lough Ree SPA 004064	 Little Grebe (<i>Tachybaptus</i> <i>ruficollis</i>) [A004] w Whooper Swan (<i>Cygnus cygnus</i>) [A038] w Wigeon (<i>Mareca</i> <i>penelope</i>) [A050] w Teal (<i>Anas crecca</i>) [A052] w 	To maintain or restore the favourable conservation condition of the bird species and wetland habitat listed as SCIs for this SPA.	1.9 km east	Hydrological and hydrogeological Upstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower]. Potential remote hydrogeological connection to groundwater dependent terrestrial ecosystem GWDTE wetland QI habitats via shared Funshinagh groundwater body.	Y

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Mallard (<i>Anas</i> <i>platyrhynchos</i>) [A053] w Shoveler (<i>Anas</i> <i>clypeata</i>) [A056] w Tufted Duck (<i>Aythya</i> <i>fuligula</i>) [A061] r, w Common Scoter (<i>Melanitta nigra</i>) [A065] r Goldeneye (<i>Bucephala clangula</i>) [A067] w Coot (<i>Fulica atra</i>) [A125] w Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Lapwing (<i>Vanellus</i> <i>vanellus</i>) [A142] w Common Tern (<i>Sterna</i> <i>hirundo</i>) [A193] r Wetland and Waterbirds [A999] 			 Appendix D shows that there is an indirect groundwater connection between the substation location and electricity line to the SPA via infiltration / groundwater flow. Any disruption to groundwater levels will be localised, short-term and very unlikely to be significant beyond 50 m of any excavation. As Lough Ree SPA is 1.9 km east of the proposed substation and a greater distance again to the electricity line, impacts on QI wetland habitats can be excluded from further assessment. Air There is no strong connection for airborne emissions and dust due to distance and screening by natural features such as hedgerow and treelines. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, or collision: Shoveler Common scoter Golden plover Common tern The following SCI species were recorded during surveys: 	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				Little grebe	
				Whooper swan	
				• Wigeon	
				• Teal	
				Mallard	
				Tufted duck	
				Coot	
				Lapwing	
				The core foraging distances for little grebe, wintering whooper swan, wigeon, teal, mallard, tufted duck, coot and lapwing are up to 20 km (SNH, 2016), 5 km (SNH, 2016), 8 km (Myrfyn & Williams, 1976), 0.8 km (Legagneux, et al., 2009), 3.3 km (Bengtsson, et al., 2014), 20 km (SNH, 2016), 20 km (SNH, 2016) and 12 km (Gillings, et al., 2007), respectively.	
				As these distances are both greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the two.	
				Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance / displacement and collision-related mortality to little grebe, whooper swan, wigeon, teal, mallard, tufted duck, coot	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				and lapwing during the construction and operational phases, cannot be ruled out at this stage and requires further consideration. Invasive species	
				There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Lough Croan Turlough SPA 004139	 Shoveler (<i>Anas</i> <i>clypeata</i>) [A056] r, w Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Greenland White- fronted Goose (<i>Anser</i> <i>albifrons flavirostris</i>) [A395] w Wetland and Waterbirds [A999] 	To maintain or restore the favourable conservation condition of the bird species and wetland habitat listed as SCIs for this SPA.	5.4 km northwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SPA is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, or collision: Shoveler Golden plover Greenland white-fronted goose 	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
River Suck Callows SPA 004097	 Whooper Swan (<i>Cygnus cygnus</i>) [A038] w Wigeon (<i>Mareca penelope</i>) [A050] w Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Lapwing (<i>Vanellus vanellus</i>) [A142] w Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] w Wetland and Waterbirds [A999] 	 To maintain the favourable conservation condition of whooper swan and wetland habitat. To restore the favourable conservation condition of wigeon, golden plover. Lapwing and Greenland white-fronted goose. 	8.8 km west	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SPA is in different groundwater bodies (Mount Mary, Suck South, Aughrim) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, or collision: Golden plover Greenland white-fronted goose The following SCI species were recorded during surveys: Whooper swan Wigeon Northern lapwing The core foraging distances for wintering whooper swan, Eurasian wigeon and northern lapwing are up to 5 km (SNH, 	Y
Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
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				2016), 8 km (Myrfyn & Williams, 1976) and 12 km (Gillings, et al., 2007), respectively. As the latter two distances are both greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the two for Eurasian wigeon and northern lapwing.	
				As the project site is beyond the core foraging range for whooper swan, any whooper swan forming part of the SPA population cannot be significantly affected by disturbance/displacement, or collision effects.	
				Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement and collision- related mortality to Eurasian wigeon and northern lapwing, cannot be ruled out at this stage and requires further consideration.	
				Invasive species	
				There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
Middle Shannon Callows SPA 004096	 Whooper Swan (Cygnus cygnus) [A038] w 	To maintain the favourable conservation condition of	8.8 km southeast	Hydrological and hydrogeological	Y

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Wigeon (<i>Mareca</i> penelope) [A050] w Corncrake (<i>Crex crex</i>) [A122] r Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Lapwing (<i>Vanellus</i> vanellus) [A142] r, w Black-tailed Godwit (<i>Limosa limosa</i>) [A156] c, w Black-headed Gull (<i>Chroicocephalus</i> ridibundus) [A179] w Wetland and Waterbirds [A999] 	 whooper swan, golden plover and wetland habitat. To restore the favourable conservation condition of wigeon, lapwing, black-tailed godwit and black-headed gull. The status of corncrake as an SCI for this SPA is currently under review. 		Downstream hydrological connectivity via Cross [Roscommon] and Shannon [Lower] (10.1 km instream distance). No hydrogeological connectivity as SPA is in a different groundwater body (Athlone West, Inny, Clara, Tynagh, Banagher) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement, or collision: • Corncrake • Golden plover • Black-tailed godwit The following SCI species were recorded during surveys: • Whooper swan • Wigeon • Northern lapwing • Black-headed gull The core foraging distances for wintering whooper swan, wigeon, northern lapwing and black-headed gull are up to 5 km	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				(SNH, 2016), 8 km (Myrfyn & Williams, 1976), 12 km (Gillings, et al., 2007) and 20 km (SNH, 2016), respectively.	
				As these latter two distances are both greater than the distance between the project site and the SPA, there is therefore ecological connectivity between the two for northern lapwing and black- headed gull.	
				As the project site is beyond the core foraging range for whooper swan and wigeon, any whooper swan or wigeon forming part of the SPA population cannot be significantly affected by disturbance/displacement, or collision effects.	
				Taking a precautionary approach, which assumes that the birds recorded during the surveys could represent SPA birds, the potential for disturbance/displacement and collision- related mortality to northern lapwing and black-headed gull, cannot be ruled out at this stage and requires further consideration.	
				Invasive species	
				Downstream hydrological connectivity provides a potential pathway for the spread of invasive species, such as Japanese knotweed, which was recorded alongside the electricity line route.	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
Four Roads Turlough SPA 004140	 Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Greenland White- fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] w Wetland and Waterbirds [A999] 	 To maintain or restore the favourable conservation condition of the bird species and wetland habitat listed as SCIs for this SPA. 	10.6 km northwest	 Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Suck South) to the project (Funshinagh). Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement: Golden plover Greenland white-fronted goose Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	Ν
Mongan Bog SPA 004017	 Greenland White- fronted Goose (Anser albifrons flavirostris) [A395] w 	• To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA.	16.7 km southeast	Hydrological and hydrogeological No hydrological connectivity. No hydrogeological connectivity as SAC is in a different groundwater body (Inny) to the project (Funshinagh). Air	N

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				 There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement: Greenland white-fronted goose Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	
SPAs with remote	e downstream hydrologica	l connectivity			
Lough Derg (Shannon) SPA 004058	 Cormorant (<i>Phalacrocorax carbo</i>) [A017] r, w Tufted Duck (<i>Aythya fuligula</i>) [A061] r, w Goldeneye (<i>Bucephala clangula</i>) [A067] w Common Tern (<i>Sterna hirundo</i>) [A193] r Wetland and Waterbirds [A999] 	• To maintain or restore the favourable conservation condition of the bird species and wetland habitat listed as SCIs for this SPA.	42 km southwest	 Hydrological and hydrogeological Very remote, downstream hydrological connectivity (67 km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to distance. Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot 	Ν

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
				be significantly affected by disturbance/displacement:	
				Common tern	
				The following SCI species were recorded during surveys:	
				Cormorant	
				Tufted duck	
				The core foraging distances for cormorant and tufted duck are up to 5.2 km (breeding season) (Thaxter, et al., 2012) to 20 km (non-breeding season), and 20 km (SNH, 2016), respectively.	
				As these distances are both less than the distance between the project site and the SPA, there is therefore no ecological connectivity between the two.	
				Invasive species	
				There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species.	
River Shannon	Cormorant	• To maintain the favourable	95 km	Hydrological and hydrogeological	N
and River Fergus Estuaries SPA (004077)	 (Phalacrocorax carbo) [A017] w Whooper Swan (Cygnus cygnus) [A038] w 	conservation condition of the bird species and wetland habitat listed as SCIs for this SPA.	southwest	Very remote, downstream hydrological connectivity (126 km instream distance). The distance is such that there is no strong connection due to dilution effects. No hydrogeological connectivity due to	
				distance.	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Light-bellied Brent Goose (<i>Branta</i> bernicla hrota) [A046] w Shelduck (<i>Tadorna</i> tadorna) [A048] w Wigeon (<i>Mareca</i> penelope) [A050] w Teal (<i>Anas crecca</i>) [A052] w Pintail (<i>Anas acuta</i>) [A054] w Shoveler (<i>Anas</i> clypeata) [A056] w Scaup (<i>Aythya marila</i>) [A062] w Ringed Plover (<i>Charadrius hiaticula</i>) [A137] w Golden Plover (<i>Pluvialis apricaria</i>) [A140] w Grey Plover (<i>Pluvialis</i> squatarola) [A141] w Lapwing (<i>Vanellus</i> vanellus) [A142] w Knot (<i>Calidris</i> canutus) [A143] w 			Air There is no strong connection for airborne emissions and dust due to distance. Ecological The following SCI species were not recorded during surveys and so cannot be significantly affected by disturbance/displacement: Light-bellied brent goose Shelduck Pintail Shoveler Scaup Ringed plover Golden plover Grey plover Knot Dunlin Black-tailed godwit Redshank Greenshank The following SCI species were recorded during surveys: Cormorant	

Site Name and Code	Qualifying Interests ³	Conservation Objectives in Summary	Direct Line Distance to Project Site and Direction	Connections in Summary (Source- Pathway-Receptor)	Considered Further in Screening (Y/N)
	 Dunlin (<i>Calidris</i> <i>alpina</i>) [A149] w Black-tailed Godwit (<i>Limosa limosa</i>) [A156] w Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] w Curlew (<i>Numenius</i> <i>arquata</i>) [A160] w Redshank (<i>Tringa</i> <i>totanus</i>) [A162] w Greenshank (<i>Tringa</i> <i>nebularia</i>) [A164] w Black-headed Gull (<i>Chroicocephalus</i> <i>ridibundus</i>) [A179] w Wetland and Waterbirds [A999] 			 Whooper swan Wigeon Teal Lapwing Curlew Black-headed gull The core foraging distances for cormorant, whooper swan, wigeon, teal, lapwing, curlew and black-headed gull are up to 20 km (SNH, 2016), 5 km (SNH, 2016), 8 km (Myrfyn & Williams, 1976), 0.8 km (Legagneux, et al., 2009), 12 km (Gillings, et al., 2007), 20 km (SNH, 2016) and 20 km (SNH, 2016), respectively. As these distances are all less than the distance between the project site and the SPA, there is therefore no ecological connectivity between the two. Invasive species There are no hydro-, hydrogeological, airborne or ecological pathways for the spread of invasive species. 	

3.4.1 Likely Significant Effects For the Project 'Alone'

3.4.1.1 No Likely Significant Effects

Likely Significant Effects on QI features of a subset of SACs and SPAs can be excluded at this stage without further assessment or mitigation. As can be seen in **Table 3.1**, these include:

- **SACs:** Lough Funshinagh SAC, Lough Croan Turlough SAC, Killeglan Grassland SAC, Four Roads Turlough SAC, Castlesampson Esker SAC, Crosswood Bog SAC, Lisduff Turlough SAC, Carn Bog SAC, Fortwilliam Turlough SAC, Lough Derg Northeast Shore SAC and Lower River Shannon SAC.
- **SPAs:** Lough Croan Turlough SPA, Four Roads Turlough SPA, Mongan Bog SPA, Lough Derg (Shannon) SPA, and River Shannon and River Fergus Estuaries SPA.

3.4.1.2 Downstream Hydrological and / or Hydrogeological Connectivity

As can be seen in **Table 3.1**, the following European sites have downstream hydrological connectivity to the project site, which also provides a pathway for the spread of invasive plant species, and require further consideration:

- **SACs:** River Shannon Callows SAC.
- **SPAs:** Middle Shannon Callows SPA.

As can be seen from Table 3.1, the following Euoprean sites have potential hydrogeological connectivity to the project site, and require further consideration:

- **SACs:** Ballynamona and Corkip Lough SAC, Lough Ree SAC, and Castlesampson Esker SAC.
- **SPAs:** Lough Ree SPA.

3.4.1.3 Ecological Connectivity

As can be seen in **Table 3.1**, the following European sites have ecological connectivity to the project site and require further consideration:

- SACs: River Shannon Callows SAC.
- **SPAs:** Lough Ree SPA, River Suck Callows SPA and Middle Shannon Callows SPA.

3.4.2 Likely Significant Effects For the Project 'In Combination'

There is the potential for other plans and projects, specifically any other land use changes, to also impact upon the designated features of the European sites listed above in **sections 3.4.1.2**, and **3.4.1.3**. Therefore, Likely Significant Effects cannot be excluded for these European sites when the Project is considered in combination with other plans and projects.

As set out in **Table 3.2** and **section 3.4.1.1** above there are no pathways for impacts between the project site and any other European sites. Likely Significant Effects can be excluded for all other European sites for the Project in combination with other Plans and Projects.

4.0 Conclusions

This AA Screening concludes that it cannot be excluded based on objective evidence and in view of best scientific knowledge, that there will not be any likely significant effects from the construction or operation activities from the project alone, and in combination with other plans or projects, on:

- Ballynamona and Corkip Lough SAC;
- River Shannon Callows SAC;
- Lough Ree SAC;
- Castlesampson Esker SAC;
- Lough Ree SPA;
- River Suck Callows SPA; and
- Middle Shannon Callows SPA.

Therefore, a Natura Impact Statement and associated mitigation measures are required.

This AA Screening also concludes that it can be excluded on the basis of objective evidence and in view of best scientific knowledge, that there will not be any likely significant effects from the Project alone, and in combination with other plans or projects, on:

- Lough Funshinagh SAC;
- Lough Croan Turlough SAC;
- Killeglan Grassland SAC;
- Four Roads Turlough SAC;
- Crosswood Bog SAC;
- Lisduff Turlough SAC;
- Carn Bog SAC;
- Fortwilliam Turlough SAC;
- Lough Croan Turlough SPA;
- Four Roads Turlough SPA;
- Mongan Bog SPA;
- Lough Derg North-east Shore SAC;
- Lower River Shannon SAC;
- Lough Derg (Shannon) SPA;
- River Shannon and River Fergus Estuaries SPA; and
- Any other European site in Ireland.

5.0 Stage 2: Appropriate Assessment

5.1 Step 1, Part 1: Information on the Project

5.1.1 Project Description

The project consists of the following elements:

- A 110 kV 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electricity substation, including a single-storey control building (with a Gross Floor Area of 450 m²); busbars, insulators, cable sealing ends, and lightning poles within a secure compound (with a total footprint of approximately 8,500 m²);
- Replacement of 1 no. existing wooden pole-set with 2 no. lattice-type interface masts, each of which will be between 16 m and 18 m in height, to facilitate connection of the electricity substation to the existing Athlone-Lanesborough 110kV overhead electricity transmission line;
- Approximately 270 m of 110kV underground electricity line between the electricity substation and the interface masts;
- Approximately 630 m of on-site access tracks with associated upgrade works to an existing agricultural entrance from the L7551;
- Approximately 7.5 km of 110kV underground electricity line between the electricity substation and the junction of the L7636 local road and R363 regional road where the electricity line will connect to grid connection infrastructure permitted as part of the Seven Hills Wind Farm (An Bord Pleanála Reference ABP-313750-22). The electricity line will be placed within private lands and within the carriageways of the L7551, L7556, L2018, L7731, R362, L2023, and L7636; and,
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works including a temporary construction compound and the provision of site drainage infrastructure and surface water protection measures.

5.1.1.1 Electricity Substation

The footprint of the substation (overall compound area) will measure approximately 8,500 m² and will be surrounded by a palisade fence, with associated gates, of 2.6 m in height for safety and security reasons. The electricity substation will contain a control building and all necessary electrical equipment and apparatus to facilitate the export of electricity from the permitted Seven Hills Wind Farm to the national grid. Ancillary infrastructure located within the footprint of the compound will include busbars, insulators, cable sealing ends, and lightning poles.

The layout of the substation has been designed fully in accordance with current EirGrid specifications; however, the Developer may be instructed by EirGrid to immaterially alter the precise siting and/or specification of the control building and/or electrical equipment within the substation compound. Any such immaterial alterations or deviations have been fully assessed and provided for within this NIS.

The site of the electricity substation is gently sloping, to the south/southwest, with approximate ground elevations ranging from c. 80 m AOD in the north of the site (interface masts) to c. 69 m AOD in the southeast (site entrance). There will be a requirement to undertake minor modifications to ground levels in order to achieve the required levels for the control building, structures and electrical equipment. A 'cut and fill' exercise will be implemented whereby excavated material at higher elevations will be excavated and used to make up levels at areas of lower elevation. This process, which accords with best practice



construction techniques, will avoid the excavation of significant volumes of soil or the importation of significant volumes of stone aggregates to provide a level compound.

The substation compound will be surfaced with c. 400 mm free-draining crushed stone such that rainwater can percolate to ground. Site investigations undertaken to date indicate that a sufficient level of usable rock material is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported to the project site from local quarries.

The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape. Further details of landscaping proposals are provided below.

5.1.1.2 Control Building

The electricity substation will contain a control building which will be operated and maintained by EirGrid. The control building will measure approximately 25 m x 18 m (gross floor area of c. 450 m²) and will have an overall height of approximately 8.5 m to ridge height. The building shall be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The control building will contain a control room to allow operatives to monitor and manage the operation of the electrical apparatus and will also include a generator room, workshop/storage facility and welfare facilities.

During the project design process, the Applicant engaged with Uisce Éireann to determine the feasibility of obtaining a water supply for the control building. Uisce Éireann confirmed that existing water infrastructure, with sufficient capacity to serve the project, is located along the adjoining L7551 local road and that, subject to a formal connection agreement, water could be provided to the control building.

Wastewater arising from the control building will be stored in a sealed sub-surface foul holding-tank and will be removed from site as required by a local licensed waste collector. Water supply and waste water management proposals of this nature are common practice for developments of this type located in remote/rural areas with infrequent usage.

The precise internal layout of the building may be subject to further immaterial alterations to reflect any future revisions to EirGrid specifications. As set out above, any immaterial deviations from the precise layout and elevations are fully provided for within this NIS.

5.1.1.3 Electrical Apparatus

Electrical equipment; including, but not limited to, busbars, switchgear, insulators, cable sealing ends, and lightning poles; will be located outside the control building (within the palisade fence).

The positioning of electrical equipment within the substation compound accords with current EirGrid specifications. Immaterial deviations to the precise siting of this internal equipment may be necessary at the time of construction in accordance with any future revisions to EirGrid specifications. To reiterate, any such deviations are fully provided for and assessed within this NIS.

5.1.1.4 Interface Masts & Underground Electricity Line

The interface masts will be lattice-type structures and will be located immediately beneath the Athlone-Lanesborough overhead electricity transmission line. The masts will have a maximum height of between 15 m and 18 m and a permanent above-ground footprint of c. 100 m² (total; c. 50 m² per mast) with concrete foundations below ground to a depth of c. 2 m. However, it should again be noted that the precise specifications of the interface masts may be immaterially altered to ensure compliance with any future revised EirGrid specifications.



One of the interface masts will replace an existing wooden pole-set associated with the existing overhead transmission line. The wooden poles and electricity line suspension equipment will be decommissioned and removed from site for re-use or recycling, where possible, or disposal at a licensed waste handling facility.

At the location of the interface masts, the existing overhead transmission line will be broken and the proposed underground electricity line (c. 270 m) will connect the existing overhead line to the electricity substation.

Once constructed, electricity being transmitted along the Athlone-Lanesborough electricity transmission line will be diverted along the proposed underground line and through the substation, allowing electricity generated by the Seven Hills Wind Farm to be exported to the national grid, before returning to the Athlone-Lanesborough electricity transmission line; hence the 'loop-in/loop-out' nature of the electricity substation.

5.1.1.5 Site Entrance & Access Track

Access to the electricity substation site will be provided via an existing agricultural access point from the L7551 local public road. The proposed site entrance will not be required to accommodate any abnormal size loads but will be upgraded to ensure ease of access and egress for standard heavy-goods vehicles (HGVs) which will deliver construction materials and electrical apparatus to the site. Works at the site entrance will comprise the removal of an existing agricultural gate and post-and-wire fencing.

The L7551 is a narrow single-lane carriageway which is assessed as conveying extremely low volumes to traffic. Due to the characteristics of the road, it has been assessed that the road has a design speed of 60 kilometres-per-hour (kph). A visibility splay of 70 m in each direction, taken from a point 2.4 m back from the road edge, is deemed appropriate and has been provided in this instance. As a consequence of the provision of the visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone walls.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. Roadside hedgerows will be regularly trimmed (outside of the bird breeding season) to ensure that visibility splays are maintained throughout the operational phase of the proposed development.

A total of approximately 630 m of on-site access track will be required for construction purposes and for site access during the operational phase. The access track shall be similar to normal agricultural tracks but with a slightly wider typical running width of approximately 4 m. The access track will largely be unsealed and constructed of crushed stone material to allow for permeability; however, c. 100 m of access track within the electricity substation compound will be finished with concrete (in accordance with EirGrid specifications). Due to the findings of site investigations and the geological characteristics of the site, usable rock material for the construction of the access track is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported from local quarries.

Additional excavated strips will be required, where necessary, alongside the access track to accommodate drainage infrastructure and the installation of the underground electricity line.

Some cut/fill in the construction of the access track will be necessary to ensure that horizontal and vertical alignments are suitable to accommodate HGV loads and drainage infrastructure. Where excess material arises from the construction of the access track, it will be utilised in the construction of trackside berms, if required, or permanently stored at the proposed spoil deposition areas.

The construction of the access track will necessitate the removal of a short section, c.15 m, of existing stone wall adjacent to the substation compound. The configuration of the access track has been designed to minimise the loss of stone wall.

5.1.1.6 Temporary Construction Compound

During the construction phase, a temporary construction compound will be required. The compound will be located adjacent to the proposed access track and will extend to an area of (0.135 ha). The construction compound will comprise of the following:

- Temporary cabins to be used for the contractor's site office, the monitoring of incoming vehicles and temporary welfare facilities for the construction staff, including temporary toilets and potable water;
- Parking for construction staff, construction vehicles, and visitors;
- Secure storage for tools, plant and small parts;
- Waste management area where waste will be sorted and collected by a licensed service provider;
- Safe bunded storage of components and materials including fuels, lubricants and oils; and,
- Security fencing around the compound.

Topsoil will be removed from the required area and side-cast for temporary storage adjacent to the compound area. The compound base will be made up of well graded aggregates, compacted as necessary, and geotextile.

Temporary welfare units, including chemical toilets, to be provided for construction staff will be sealed units to ensure that no discharges escape into the local environment. These will be supplied and maintained by a licensed supplier. Potable water (for drinking, food preparation, and hand washing etc.) will be supplied on-site by water dispensers and this will also be sourced and maintained by a licensed supplier.

The construction compound will be marked out and fenced to prevent encroachment onto non-designated areas. Following the completion of all construction activities, the compound will be decommissioned with all structures removed and fully reinstated. Reinstatement will involve removing crushed stone and underlying geotextile, covering with topsoil and reseeding.

The temporary construction compound has been located and designed such that all cabins, storage containers, waste management facilities and bunded areas will be located a minimum distance of 50 m from all watercourses/drainage ditches in order to minimise the risk of pollution and the discharge of deleterious matter. Stormwater which may arise from the roofs of cabins, containers or from sealed bunds will be passed through an oil interceptor prior to being discharged to the local environment.

Given the linear nature of the electricity line route, it is likely that a number of small material storage areas will be utilised along the route during the construction phase to minimise the transportation of construction materials (e.g. ducting, electricity line, joint bays, etc.). Such temporary compounds are likely to be located within agricultural farmyards or business premises along the route. Subject to a grant of planning permission, the appointed contractor will be responsible for securing consent from relevant landowners for use of their properties as temporary compound/storage areas.

5.1.1.7 Underground Electricity Line

The electricity substation will be connected to the permitted Seven Hills Wind Farm grid connection infrastructure via c. 7.5 km of 110kV underground electricity line. From the



substation, the electricity line will be located within the proposed access track to its junction with the L7551 local road and will then follow the L7551, L7556, L2018, L7731, R362, L2023, and L7636 to its junction with the R363 at Brideswell.

The electricity line will be installed within ducting in an excavated trench of c. 1.3 m deep and c. 0.6 m wide and pulled through the ducting in sections of c. 750 m in length or depending on the length of electricity line required. Cable (electricity line) lengths will be connected at designated 'joint bays' to be constructed along the route. It is estimated that 11 no. joint bays will be required along the route of the underground electricity line; however, the exact number to be constructed will be confirmed as part of the post-consent detailed design process. Joint bays will, insofar as possible, be located within roadside verge or at agricultural access points to minimise the extent of joint bay infrastructure within the paved carriageway of the public road network.

Following the installation of the ducting and joint bays, ground levels will then be made up using appropriate material in accordance with the requirements of EirGrid/ESB Networks and finished/reinstated to the requirements of the Planning Authority (public road) or landowner (private lands). Further, all public roads within which it is proposed to install the underground electricity line will be subject to a full-carriageway reinstatement (re-surfacing) of the relevant road section thus ensuring that there are no long-term effects on the public road network.

All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials will be stored separately (subsoil and aggregates) for use during the reinstatement of the trench and joint bays or disposed of at an appropriate licensed facility as necessary. The sequence of works is typically as follows:

- Identify existing underground services prior to excavation;
- Excavate the trench to the required dimensions;
- Place a blinding layer at the base of the trench;
- Place and joint the high-density polyethylene (HDPE) power ducts using ties at 3 m intervals;
- Lay in and compact a layer of leanmix concrete around and above ducts and place red marker strips above;
- Install 2 no. HDPE communications cable ducts;
- Lay in and compact an additional layer of leanmix concrete and place further red marker strips above;
- Final backfill layer to include yellow warning tape; and
- Appropriate reinstatement, as discussed above.

Prior to the commencement of construction, a detailed Method Statement will be prepared by the contractor, to be appointed by the Developer, outlining the precise methodology to be followed during the trenching phase. This Method Statement will be reviewed by the Environmental Manager (EM; to be appointed by the selected contractor) to ensure that the environmental protective measures to be implemented are suitable and to the required standard.

Horizontal Directional Drilling (HDD) will be undertaken at 1 no. location along the underground electricity line. HDD will be undertaken at the intersection of the underground electricity line and the Cross (Roscommon) River and the use of this methodology will avoid any in-stream works or any direct or indirect effect on the existing bridging structure. Launch and receptor pits will be excavated at either side of the river; a minimum of 15 m away from the river; to accommodate the drilling rig. The bore will be at a minimum depth of 2.5 m



below the bridging structure to ensure that there are no impacts on the structural integrity and stability of the bridges. Following the installation of the ducts, the launch and receptor pits will be fully reinstated. Marker posts will be placed at either side of the road to indicate the location and alignment of the electricity line.

Prior to the commencement of drilling operations, the appointed contractor will prepare a detailed Method Statement outlining the precise methodology to be implemented. This statement will be reviewed by the EM to ensure that the environmental protective measures to be implemented are suitable and to the required standard and may be reviewed, as necessary, by the Planning Authority.

5.1.1.8 Earthworks

Earthworks will largely arise from the excavation of topsoil, subsoil and rock (if present) at the locations of the electricity substation, access track, interface masts and along the route of the electricity line.

The site of the electricity substation is gently sloping towards the south-southeast and, as a result, extensive earthworks are not required. As set out above, in order to provide a level substation compound and to ensure appropriate levels are available for the construction of the electrical control building and electrical equipment foundations, it is proposed to implement a cut and fill approach whereby material excavated at higher elevations will be deposited at areas of lower elevation. This process will avoid excessively deep or expansive excavations and will, similarly, avoid the requirement to import significant volumes of stone aggregates to make up levels. Additionally, this process will ensure that the geological integrity of the site is maintained. Following the cut and fill process, the substation compound will be finished with compacted stone aggregates.

Due to the generally shallow nature of excavations, substantial volumes of spoil are not predicted to be generated. It is proposed that subsoil will, insofar as possible, be utilised to make up levels at the electricity substation compound; while topsoil will be used in the post-construction reinstatement of the project (e.g. at the electricity substation site, interface mast foundations, access track and electricity line trenches).

As part of the design process, considerable attention has been given to the extent of excavations required to construct the project in order to minimise the generation of spoil and, subsequently, to the management of excavated material. **Table 5.1** below, provides a breakdown of the spoil volumes predicted to be generated and proposals regarding the reuse or disposal of this material.

Where excess material is generated at the electricity substation site which cannot be utilised for reinstatement or landscaping purposes, it is proposed to develop 2 no. dedicated spoil deposition areas to the east and west, respectively, of the electricity substation where excess material will be stored permanently. It is estimated that c. 5,380 m³ of excess material will be stored within the deposition areas. The location of the deposition areas was selected due to the general absence of environmental constraints, available separation distances to watercourses, generally flat or gently sloping gradient and close proximity thus avoiding traffic movements on the public road network.

Spoil will be transported to the deposition areas where it will be placed in layers in accordance with best-practice methods. Appropriate drainage management measures will be implemented to ensure that the deposited spoil does not become waterlogged. Following the completion of construction, the deposition areas will be graded to match the profile of surrounding land, covered with topsoil and reseeded. Works at the spoil deposition areas will be monitored, on a weekly basis during the construction phase and monthly for a 6-month period thereafter, by an appropriately qualified geotechnical engineer.

During the construction phase, material will be generated from the excavation of the underground electricity line trench and joint bays. In total, it is estimated that c. 11,240 m³ will be excavated comprising peat, subsoil and road pavement material. Due to potential for soil contamination arising from the presence of pavement material (tar & chips, etc.); all material excavated from the electricity line trench will be disposed of at an approved waste facility.

Project Element	Volume of Material to be Excavated (m ³)	Volume of Material to be utilised for construction/ reinstatement/ landscaping (m ³)	Volume of Material to be disposed of in deposition areas (m ³)	Volume to be disposed of off- site (m ³)
Electricity Substation (incl. access track, temporary construction compound and interface masts)	14,010	9,310	4,700	0
Underground Electricity Line	11,240	0	680	10,550

Table 5.1: Spoil Generation and Management

A Planning-Stage Spoil Management Plan has been prepared to detail proposals regarding the appropriate management of material which may arise from the construction of the project. Prior to the commencement of development at the site, a detailed Spoil Management Plan will be prepared following the post-consent detailed design process and will address the reuse, reinstatement, storage and restoration of all material excavated during the construction phase including detailed methodologies regarding the establishment and management of the spoil deposition areas.

5.1.1.9 Construction Drainage Management & Disposal

Possible sources of effects on the hydrological environment during construction include increased volumes of surface water runoff; the generation of silt laden runoff from excavations and the storage of stockpiled materials; contamination due to the leakage of oils/fuel from site vehicles; spillage during refuelling operations; and leakage from chemical, waste and fuel storage areas.

A series of embedded best-practice drainage measures have been incorporated within the project design. Firstly, clean water drains will be installed upslope of the works area to intercept incidental surface water runoff and direct it away from the works area to prevent it becoming contaminated. Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain; before water is discharged by a buffered outfall or level spreader at greenfield rates. Water will be discharged from the clean water drains over grassland to provide filtration and to ensure that no silt or sediment is discharged to the drainage network.

All surface water runoff from works areas, excavations, stockpiles, or from dewatering activities at the electricity substation site will be intercepted by downslope dirty water drains. The dirty water drains will include check dams to limit flow rates to avoid any erosion or scouring of the drains. The drains will direct dirty water to silt traps (also known as silt/settlement/sediment/stilling ponds) where water will be stored for an appropriate period of time such that silt/sediment or suspended material falls to the floor of the silt trap. The treated



(clean) water will then be discharged from the silt trap via a buffered outfall or level spreader, at greenfield rates, over grassland to provide a further layer of filtration and treatment.

Other surface water protection measures which may be implemented, as appropriate, include silt bags and siltbusters.

Surface water control measures will be implemented as construction progresses through the substation site; however, prior to the commencement of earthworks, temporary silt/sediment control infrastructure (e.g. silt bags and siltbusters) may be installed, as required, until the full range of construction phase measures are installed.

The inclusion of these surface water runoff measures within the project design will avoid any discharge of silt or sediment laden waters directly to any surface water feature or to ground prior to being fully treated. The precise design, sizing and siting of drainage infrastructure (including the size of silt traps and discharge rates) will be confirmed as part of the post-consent detailed design process; however, it can be confirmed that the design will be reflective of predicted precipitation levels with an appropriate allowance for climate change.

Following the completion of construction, it is likely that the majority of surface water infrastructure will be maintained to ensure the appropriate drainage of the site during the operational phase; however, some infrastructure, such as that installed at the temporary construction compound, will be decommissioned.

Due to the permeable nature of the access track and substation compound, the vast majority of rainfall will percolate to ground during the operational phase. Stormwater drainage infrastructure will be installed around the electricity substation control building to capture any runoff from roofed or paved areas; while permanent drainage infrastructure will be installed at the perimeter of the electricity substation compound. All stormwater and surface water from the electricity substation compound will be directed to a permanent attenuation pond which will allow for the storage of water until such time as all suspended sediment is removed and the water can be safely discharged. As above, water will be discharged via a buffered outfall or level spreader over grassland. Additionally, all stormwater and surface water from the substation compound will be passed through an oil/hydrocarbon interceptor to prevent the discharge of any hydrocarbons.

In all cases, discharge rates have been designed to mimic greenfield runoff rates thus avoiding any long term alteration to the hydrological or hydrogeological regime of the substation site.

Along the route of the underground electricity line, temporary surface water control measures will be installed within roadside drainage features as construction progresses along the route. Such features may include silt fences or silt traps which will ensure that silt/sediment or suspended material is not discharged to downstream waters.

As described, at the intersection of the route of the underground electricity line and the Cross (Roscommon) River, it is proposed that the underground electricity line will be installed via HDD. All HDD works will be undertaken in strict accordance with best practice methodologies with surface water measures being installed; including implementation of exclusion zones within 15 m of the river, installation of double silt fencing, avoidance of any refuelling activities within 100 m of the river, bunding of the Clear Bore[™] batching, pumping and recycling plants, spill kits being available in the event of an accidental spillage or leakage, and the provision of adequately sized skips for the temporary storage of drilling arisings and drilling flush. All such arisings and flush will be disposed of at a licensed waste management facility.

The precise implementation and siting of these surface water protection measures will be determined, subject to planning permission being granted, following the further post-consent detailed design process and will be included within a detailed CEMP to be agreed with the Planning Authority prior to the commencement of construction.

A Planning-Stage Stormwater Management Plan has been prepared in respect of the project (enclosed within the Planning-Stage CEMP). This Stormwater Management Plan will also be further developed prior to the commencement of development, following the post-consent detailed design process, and will incorporate the precise implementation and siting of surface water management infrastructure.

5.1.1.10 Landscaping

Due to the characteristics of the proposed electricity substation site, there will be no requirement for the removal of hedgerows or trees. The proposed access track, however, intersects with an existing stone wall and it is proposed to permanently remove c. 15 m of the wall.

In order to assist in the assimilation of the electricity substation into the existing landscape fabric, a series of landscaping proposals have been incorporated into the design of the project and comprise the following:

- Bolstering of existing field boundaries;
- Planting of new hedgerows and trees around the electricity substation; and,
- Planting of wildflower or wild grass mixes at infrastructure margins, residual areas of the substation site and atop the western spoil deposition area.

In addition to the visual screening effect of the proposals; particularly from the L7551 local road; the proposed landscaping measures have been incorporated into the design of the project to also ensure that there is no net loss of biodiversity as a result of the project and, insofar as possible, give rise to a biodiversity net gain.

Hedgerow and tree species to be planted will be native Irish species and will be selected to complement those current found within the local landscape. The proposed planting locations have been carefully selected to ensure sufficient separation distances to electrical equipment.

5.1.1.11 Aggregates Sources, Haul Routes & Quantities

Aggregates; including stone and concrete; will be imported from local suppliers. No rock will be sourced from on-site excavations for reuse in the construction phase.

Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used. These aggregates are slated for extraction in the normal course of the relevant quarry's business and therefore will have no additional likely significant environmental impacts above and beyond those normally entailed in the operation of the quarry.

As part of a Traffic Management Plan, which will be agreed with the Planning Authority prior to the commencement of development, suppliers will be instructed to utilise the national and regional road networks to access the site, and to avoid local roads, insofar as possible.

On the basis of the design process undertaken to date, the estimated volumes of construction materials/aggregates (rock/stone and concrete) required in the construction of the project are detailed at **Table 5.2** below.

Infrastructure ID	Rock/Stone sourced from On-Site Excavations	Infrastructure ID	Rock/Stone sourced from On-Site Excavations	Infrastructure ID
Electricity Substation (incl. access track, temporary construction compound and interface masts)	0	7,710	160	0
Underground Electricity Line	0	4,780	4,240	2,220

Table 5.2: Estimated Construction Material (Aggregates) Volumes

5.1.2 Construction Phase

The construction phase is likely to last for approximately 15-18 months from commencement of further site investigations through the installation of underground electricity line, construction of the electricity substation and concluding with the commissioning of the electrical apparatus, site reinstatement and landscaping.

The construction phase of the project will comprise a six day week with normal working hours from 07:00 to 19:00, Monday to Friday and 07:00 to 13:00 on Saturdays. No works will be undertaken on Sundays or on public holidays. It may, however, be necessary to undertake works outside of these normal hours in exceptional circumstances or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

No construction works are envisaged during the operational phase. Works during this phase will typically involve the routine maintenance, inspection and servicing of the electrical equipment and the electricity substation site.

5.1.2.1 Construction Method

The construction method for the project will consist of the following general sequence:

- Establishment of necessary traffic management measures. Substation site entrance works to be completed ensuring that requisite visibility splays are provided;
- Installation of preliminary surface water control measures;
- Establishment of temporary construction compound;
- Progressive construction of the access track and installation of drainage system and surface water control measures;
- As construction progresses through the site, temporary (construction phase only) acoustic and visual screening barriers will be installed to the south of the access track leading to the substation compound and to the south of the substation compound itself. These barriers will be installed to minimise the visibility of, and noise emissions from, construction activities which may cause disturbance to avian species utilising the turloughs located to the south of the electricity substation site.;
- Site preparatory and groundworks associated with the substation compound including control building foundations;
- Establishment and continued management of spoil deposition areas;

- Construction of the control building;
- Construction of bases or plinths for electrical apparatus;
- Erection of palisade fencing around substation compound;
- Installation of internal and external electrical apparatus in control building and within compound;
- Installation of underground electricity line (including joint bays) between electricity substation and Seven Hills Wind Farm grid connection infrastructure (junction of the L7636 and R363);
- Preparatory groundworks associated with the interface mast and construction of mast foundations;
- Erection of interface masts;
- Decommissioning of 1 no. existing wooden pole-set;
- Installation of underground electricity line between substation and interface masts;
- Commissioning and testing of electrical apparatus within substation;
- Connection of electricity substation to the underground electricity line and to the 110kV Athlone-Lanesborough electricity transmission line;
- Final commissioning of electrical apparatus and underground electricity line; and,
- Progressive site reinstatement, restoration, landscaping and planting proposals including the installation of stockproof fencing and the erection of gates.

A detailed CEMP; which will further develop the Planning-Stage CEMP will be prepared in advance of all construction activities and will incorporate all mitigation measures included in this NIS.

The construction phase will be supervised by a range of environmental and engineering specialist personnel; including a Project Supervisor for the Construction Stage (PSCS), Ecological Clerk of Works (ECoW), Archaeological Clerk of Works (ACoW), and Geotechnical Clerk of Works (GCoW), among others; who will liaise closely with the appointed contractor's on-site Environmental Manager (EM) to monitor construction activities and to ensure that all mitigation measures included in this EIAR, and all conditions of consent subject to a grant of planning permission, are implemented.

The detailed CEMP, which will incorporate further technical information following the undertaking of post-consent detailed design work, will be submitted to the Planning Authority for approval prior to any works commencing on the project site. The CEMP shall also provide additional details of embedded best construction practices including:

- Specific design details of the temporary construction compound, including specific identification of areas for the storage of construction waste, site offices and staff facilities;
- A detailed Traffic Management Plan for the timing and routing of construction traffic to and from the construction site and associated directional signage, to include, in particular, proposals to facilitate and manage the delivery of loads and alternative arrangements to be put in place for pedestrians and vehicles during the course of site development works;
- Implementation stage details of the proposed construction methods, including detailed measures regarding the management of spoil;

- Implementation stage details to prevent the spillage or deposit of clay, rubble or other debris on the public road network;
- Implementation stage details for the prevention of noise, dust and vibration, and any monitoring of such levels;
- Storage and containment of all construction related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained. All such bunds shall be roofed to exclude rainwater;
- Appropriate provision for refuelling of vehicles;
- Off-site disposal of construction waste:
- Final drainage design specifications to ensure that surface water run-off is controlled such that no silt or other pollutants enter watercourses in full compliance with the measures outlined in this EIAR; and,
- Further details of the intended hours of construction.

The CEMP will also take full cognisance of, and incorporate, the measures outlined within any specific environmental management plans and will also incorporate any specific requirements set out in conditions of consent, subject to a grant of planning permission.

5.1.2.2 Construction Site Entrance

As discussed above, access to the substation site will be provided via an existing agricultural access point from the L7551 local public road. The site entrance will not be required to accommodate any abnormal size loads but has been designed to ensure ease of access and egress for standard HGVs which will deliver construction materials and electrical apparatus to the site.

The site entrance will be constructed in accordance with the requirements of the Planning Authority and appropriate visibility splays of 70 m in each direction have been provided. Due to the requirement to provide visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone wall.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access.

5.1.2.3 Site Access Track

The on-site access track will generally be constructed as follows:

- Topsoil and subsoil will be excavated, side-cast and stored in separate mounds in appropriate areas adjacent to the access track;
- Crushed stone will be laid on a geo-textile mat (where required) and compacted in layers to an appropriate depth. The access track will not be finished with tar and chips or concrete (other than a short section within the electricity substation compound which shall be finished with concrete) and the surface will be permeable to allow incidental rainfall to percolate to ground; thus avoiding significant volumes of surface water run-off being generated and avoiding changes to the natural drainage regime;
- Drainage infrastructure and the underground electricity line will be installed adjacent to the access track;
- The edges of the access track will be finished and reinstated with excavated material and reseeded or allowed to vegetate naturally.



5.1.2.4 Chemical Storage and Refuelling

As described above, storage areas for chemicals and fuels will comprise bunded areas of sufficient capacity within the temporary construction compound. An oil interceptor will be installed within the surface water drainage system during the construction phase to intercept any accidental hydrocarbon spillages/discharges that may be present.

From the construction compound, fuel will be transported to the works area, by a 4x4, in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity. As above, a 50 m buffer will be observed around all natural surface water features and no refuelling will be permitted within this zone.

5.1.2.5 Construction Waste Management

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical toilets;
- Plastics; and
- Oils and chemicals.

Waste disposal measures proposed include:

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, subsoil, concrete, rock, tiles, oils/fuels, metals, electricity cable offcuts, dry recyclables (e.g. cardboard, plastic, timber);
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left-over materials (e.g. timber off-cuts) and any suitable demolition materials shall be re-used on-site;
- Uncontaminated excavated material (topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill;
- If suitable rock is encountered, it will be utilised for infill during construction;
- All waste leaving the site will be transported by licensed contractors and taken to suitably licensed facilities and will be recycled or reused where possible; and,
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

A Waste Management Plan has been prepared for the project and is included within the Planning-Stage Construction & Environmental Management Plan.

5.1.2.6 Construction Employment

It is estimated that up to 40 no. people will be employed during the approximately 15-18 month construction phase. The actual number will depend on the activities being undertaken at any given time and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor appointed by the Developer, but it is likely that the workforce will include labour from the local area.

5.1.2.7 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:

- Articulated trucks (HGVs) to bring initial plant and machinery to site and later to bring electrical equipment and other construction materials;
- Tipper trucks and excavation plant involved in site development and excavation works;
- Miscellaneous vehicles and handling equipment, including vehicles associated with construction workforce.

Effects from construction traffic could include temporarily increased local traffic levels and traffic noise; while disruption is likely to occur during the installation of the underground electricity line. Construction traffic on the local road network and construction works along the electricity line route will be managed in accordance with a Traffic Management Plan and the requirements of Roscommon County Council.

Traffic management measures will be implemented during the construction phase, as follows:

- Signage on approach roads and at the site entrance giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads, where restrictions have to be put in place (e.g. along the electricity line route). Local access for residents and landowners will be maintained at all times;
- Appropriate arrangements will be implemented for school bus routes and/or other public transport services;
- One way systems will be implemented for construction traffic, where possible, to prevent construction vehicles meeting;
- Speed limits will be strictly enforced;
- A designated person will be appointed to manage access arrangements and act as a point of contact to the public; and,
- All reinstatement works to be carried out in full consultation with Roscommon County Council.

5.1.3 Operational Phase

During the operational phase, other than routine maintenance and monitoring, there will be no other activities associated with the project. On average, the site will be visited on 1-2 no. occasions per week by a light commercial vehicle for maintenance purposes. In exceptional circumstances, there may be a requirement to replace an electrical component which may require more substantive works on site; however, large scale construction works would not be required.

Waste will be generated during the operational phase including, for example, packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with all relevant waste management regulations and guidelines.

5.1.4 Decommissioning Phase

While the primary function of the project is to facilitate the connection of the Seven Hills Wind Farm to the national electricity grid; the project will, once operational, be operated and maintained by EirGrid as part of the national electricity network. As a result, it is highly likely



that the project will continue to operate following the decommissioning of the Seven Hills Wind Farm and, therefore, decommissioning of the project is not proposed.

5.1.5 Ecological Baseline

5.1.5.1 Ecology Surveys

Table 5.3 details all the surveys undertaken at the project site.

Table 5.3: Summary of Ecology Surveys

Survey	Brief Description	Timing
Scoping survey	An initial survey to identify any major constraints.	19 th October 2023
Bird surveys	Winter feeding distribution surveys within the substation developable area, along the electricity line corridor, plus 500 m surrounding the same. Full details of the survey methodology are included in the baseline bird report in Appendix B . Note another electricity line route was under consideration at the time of survey. There is some overlap between this and the proposed electricity line considered here.	Non-breeding season 2023/24: Fortnightly from 19 th October 2023 to 11 th March 2024
	Breeding bird survey within the substation developable area prior to extended habitat survey.	25 th April 2024 23 rd May 2024
Aquatic surveys	A survey for aquatic habitats, fisheries potential (including salmonid and lamprey habitat), white-clawed crayfish, macro- invertebrates (biological water quality), macrophytes and aquatic bryophytes, aquatic invasive species, and species of conservation value, which may use the watercourses in vicinity of the project. Full details of the survey methodology are included in the aquatic survey report in Appendix C . Note that this survey was	7 th February 2024
	of the proposed watercourse crossing, as another electricity line route was under consideration at the time of survey.	
Extended habitat survey	A survey to map the habitats present within the developable area for the substation and along the electricity line route,	22 nd and 23 rd May 2024

Survey	Brief Description	Timing
	along with other ecological features, such as mammals, invertebrates, and plants.	
Annex I habitats	A survey to determine if turlough habitats (Fossitt code FL6) correspond with priority Annex I habitat 3180.	23 rd May 2024

5.1.5.2 Annex I Habitats

No Annex I habitats were recorded within the project site. Priority Annex I turlough habitat (3180) was present immediately south of the substation site.

5.1.5.3 QI Species

Black-headed gull

Black-headed gull were commonly recorded both flying and foraging during most survey months in the winter. They were most frequently recorded on the turloughs south-west of the proposed substation (the closest flocks were c. 170 m from this location). A peak count of 108 birds was recorded in January 2024. Observations were also made of flocks of black headed gulls foraging in improved agricultural grassland within the 500 m survey buffer of the electricity line route (the closest flocks were 185 m from this location).

This species was also recorded near the proposed substation during the project scoping visit in October 2023, and during the extended habitat survey in May 2024 (peak count of five birds). This species was using turlough and improved agricultural grassland fields for foraging on both occasions. No evidence of breeding was recorded near the turloughs.

Eurasian coot

Eurasian coot were recorded during the winter in February and March 2024 only, across turloughs within the 500 m survey buffer of the proposed substation. A peak count of six birds was recorded on the turloughs approximately 450 m south / south-west of the proposed substation. The closest coot observations were c.260 m south of this location.

A Eurasian coot nest was recorded in March 2024 within the overlapping 500 m survey buffer area of the electricity line route. This nest was in a pond approximately 100 m to the south of the L2018. In addition, a mother and five chicks were recorded in the turlough c.400 m south of the proposed substation during the extended habitat survey in May 2024. Thus, this species was confirmed breeding.

Eurasian teal

Eurasian teal were frequently recorded across the winter survey period with a peak count of 33 in January 2024. Most observations of Eurasian teal were within the turloughs south-west and approximately 450 m from the proposed substation. Smaller flocks were sometimes observed in the turlough south of the proposed substation (c. 270 m away), and in a pond within the 500 m survey buffer along the electricity line route (c. 120 m away).

Eurasian wigeon

Eurasian wigeon were recorded during the surveys from November 2023 to March 2024. The highest concentration of this species was observed within the turloughs south-west of the proposed substation, with a peak count of 84 recorded. These flocks were between 300-600 m from the proposed substation. Smaller flocks of Eurasian wigeon were observed



within other turloughs within the 500 m survey buffer along the electricity line corridor (the closest flock was c. 200 m from this location).

Little egret

This species was recorded in the southwest turlough during the May 2024 extended habitat survey (single bird c. 550 m from the proposed substation).

Little grebe

Little grebe observations were made in February and March 2024, with a peak count of two birds recorded. This species was recorded within the turloughs south / south-west of the proposed substation (c.290 m away), and within a pond within the buffer area of the electricity line route (c. 200 m away).

Mallard

Mallard observations were mostly made on the turloughs south of the proposed substation (c. 280 m away). Mallards were recorded in all winter months except November 2023. A peak count of six birds was made in February 2024. A small number of mallard were seen c. 120 m from the electricity line route in a field.

A pair were seen in the western turlough (c. 450 m away) and a few single mallards were seen in the eastern turlough south of the proposed substation during the extended habitat survey in May 2024.

Northern lapwing

Winter observations of northern lapwing were made in the months of October 2023 to February 2024. The highest concentrations of lapwing were observed repeatedly on the turloughs south / south-west of the proposed substation, with a peak count of 120 birds recorded in February 2024. These flocks were located between 400 – 700 m from the proposed substation. Smaller flocks were observed foraging closer at c. 240 m from this location and, in improved agricultural grasslands in buffer areas along the electricity line route (the closest flock was c. 200 m from the electricity line route).

This species was also heard near the turloughs south of proposed substation during the 2023 scoping visit in October 2023.

Tufted duck

Tufted ducks were recorded in February and March 2024 and a peak count of eight birds was recorded in February 2024. All recordings of tufted duck were within the turloughs south/south-west of the proposed substation. Most observations were made between approximately 220 - 450 m from the proposed substation.

No breeding tufted duck were detected during the extended habitat survey in May 2024.

Whooper swan

Whooper swan were recorded during three of the twelve feeding distribution surveys. A peak of count of 14 whooper swans was recorded during the second survey of December 2023. Both adult and juvenile whooper swans were observed during the surveys. All whooper swan observations were exclusive to the turloughs south-west of the proposed substation. No whooper swans were recorded within the site but were observed within the proposed substation and grid route 500 m survey buffer, approximately 450 metres south-west of the proposed substation.

Otter

No otter holts, couches or signs were recorded within 150 m of the proposed crossing of the Cross River. Two spraints were recorded 2.8 km downstream and the area is considered to offer good foraging and commuting habitat.

Brook lamprey

Very strong eDNA signatures were present for brook lamprey 2.8 km downstream of the proposed crossing of the Cross River, with good spawning and moderate quality nursery habitat present. More significant lamprey habitat exists further downstream again.

5.1.5.4 Ecological Connections

Potential ecological connectivity between the project site and the following European sites has been identified due to mobile QI species: River Shannon Callows SAC, Lough Ree SPA, River Suck Callows SPA and Middle Shannon Callows SPA.

5.1.5.5 Hydrological and Hydrogeological Connections

There is direct, downstream hydrological connectivity the project site and the following European sites: River Shannon Callows SAC and Middle Shannon Callows SPA.

Potential hydrogeological connections were identified for Ballynamona and Corkip Lough SAC, Lough Ree SAC, Lough Ree SPA and Castlesampson Esker SAC.

5.2 Step 1, Part 2: Information on European Sites

The conservation objectives for the European sites for which a pathway to impact has been identified are summarised below. Only the QIs for which a potential impact has been identified are included in the summary.

5.2.1 Lough Ree SPA

Lough Ree SPA has generic conservation objectives (NPWS, 2022):

'To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.'

The QI bird species from this SPA considered to have ecological connectivity with the project site are:

- Little grebe;
- Whooper swan;
- Wigeon;
- Teal;
- Mallard;
- Tufted duck;
- Coot; and
- Lapwing.

In absence of detailed conservation objectives, the following approach was used to determine the conservation condition and objectives for Lough Ree SPA's QIs. If peak

counts from most recent survey (IWeBS⁴ or swan census) were the same or higher than the baseline reference value cited in the site synopsis (NPWS, 2015), then the condition was judged to be favourable. Conversely if they were lower, then the condition was judged to be unfavourable.

5.2.1.1 Little grebe

The baseline reference value of 52 wintering birds (three-year mean peaks 1997/98 to 1999/20) is slightly lower than the 54 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for little grebe is favourable and the objective is to maintain favourable conservation condition.

5.2.1.2 Whooper swan

The baseline reference value of 39 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably lower than the 195 wintering birds recorded by the most recent swan census (Burke, et al., 2021). Therefore, the conservation condition for whooper swan is favourable and the objective is to maintain favourable conservation condition.

5.2.1.3 Wigeon

The baseline reference value of 2,070 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably higher than the 270 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for wigeon is unfavourable and the objective is to restore favourable conservation condition.

5.2.1.4 Teal

The baseline reference value of 1,474 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably higher than the 155 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for teal is unfavourable and the objective is to restore favourable conservation condition.

5.2.1.5 Mallard

The baseline reference value of 1,087 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably higher than the 302 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for mallard is unfavourable and the objective is to restore favourable conservation condition.

5.2.1.6 Tufted duck

The baseline reference value of 1,012 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably higher than the 708 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for wintering tufted duck is unfavourable and the objective is to restore favourable conservation condition.

While the baseline reference value is given as 202 breeding pairs (records from 1995), there are no more recent estimates of breeding pairs. Following the precautionary principle, the

⁴⁴ <u>https://c0amf055.caspio.com/dp/f4db30005dbe20614b404564be88</u> [last accessed 06/11/2024]

conservation condition for breeding tufted duck is unfavourable and the objective is to restore favourable conservation condition.

5.2.1.7 Coot

The baseline reference value of 338 wintering birds (three-year mean peaks 1997/98 to 1999/20) is slightly lower than the 388 birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for coot is favourable and the objective is to maintain favourable conservation condition.

5.2.1.8 Lapwing

The baseline reference value of 5,793 wintering birds (three-year mean peaks 1997/98 to 1999/20) is considerably higher than the 1,277 wintering birds recorded by the most recent IWeBS survey⁴ (five-year mean peaks 2016/17 to 2020/21). Therefore, the conservation condition for lapwing is unfavourable and the objective is to restore favourable conservation condition.

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, 'Wetland and Waterbirds' may be included as a QI for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a second objective is included for Lough Ree SPA as follows:

'To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ree SPA as a resource for the regularly occurring migratory waterbirds that utilise it.'

Under the precautionary principle, the assumption is that the wetland habitat is unfavourable, and the conservation objective is to restore favourable conservation condition.

5.2.2 Lough Ree SAC

River Shannon Callows SAC has site specific conservation objectives (NPWS, 2016). These provide clarity on the definition of favourable conservation condition for the QIs of the SAC, and state whether the QIs are favourable or unfavourable. These are summarised in Table 5.4.

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Alkaline fens	Habitat area	Favourable / Maintain
	Habitat distribution	
	Hydrological regime	
	Peat formation	
	Water quality: nutrients	
	Vegetation structure: typical species	
	Vegetation composition: trees and shrubs	
	Physical structure: disturbed bare ground	
	Physical structure: drainage	
Bog woodlands	Habitat area	Unfavourable / Restore

Table 5.4: Lough Ree SAC



QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
	Habitat distribution	
	Vegetation composition: positive indicator species	
	Vegetation composition: negative indicator species	
	Woodland structure: cover and height of birch	
	Woodland structure: dwarf shrub cover	
	Woodland structure: ling cover	
	Woodland structure: bryophyte cover	
	Woodland structure: tree size classes	
	Woodland structure: senescent and dead wood	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	There are no conservation objectives for this habitat. The conservation objectives supporting document is due to be reviewed and updated shortly (NPWS, 2024)	Assumed to be unfavourable / restore as a precaution

5.2.3 Ballynamona and Corkip Lough SAC

Ballynamona and Corkip Lough SAC has site specific conservation objectives (NPWS, 2016). These provide clarity on the definition of favourable conservation condition for the QIs of the SAC, and state whether the QIs are favourable or unfavourable. These are summarised in **Table 5.5**.

Table 5.5: Ballynamona	Bog and	Corkip	Lough	SAC
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QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Turloughs	Habitat area	Unfavourable / Restore
	Habitat distribution	
	Hydrological regime: flood duration, frequency, area, depth; permanently flooded area	
	Soil type: area	
	Soil nutrient status: nitrogen and phosphorus	
	Physical structure: bare ground	
	Chemical processes: calcium carbonate deposition and concentration	

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
	Water quality: nutrients; colour; phytoplankton; epiphyton	
	Active peat formation	
	Vegetation composition: area of vegetation communities	
	Vegetation composition: vegetation zonation	
	Vegetation structure: sward height	
	Typical species: terrestrial, wetland and aquatic plants, invertebrates and birds	
	Fringing habitats: area	
	Vegetation structure: turlough woodland	
Bog woodlands	Habitat area	Unfavourable / Restore
	Habitat distribution	
	Vegetation composition: positive indicator species	
	Vegetation composition: negative indicator species	
	Woodland structure: cover and height of birch	
	Woodland structure: dwarf shrub cover	
	Woodland structure: ling cover	
	Woodland structure: bryophyte cover	
	Woodland structure: tree size classes	
	Woodland structure: senescent and dead wood	

5.2.4 Castlesampson Esker SAC

Castlesampson Esker SAC has site specific conservation objectives (NPWS, 2021). These provide clarity on the definition of favourable conservation condition for the QIs of the SAC, and state whether the QIs are favourable or unfavourable. These are summarised in **Table 5.6**.

Table 5.6: Castlesampson Esker SAC	,
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QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Turloughs	Habitat area	Unfavourable / Restore
	Habitat distribution	

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
	Hydrological regime	
	Soil type	
	Soil nutrient status: nitrogen and phosphorus	
	Physical structure: presence bare ground	
	Chemical processes: calcium carbonate deposition and concentration	
	Active peat formation	
	Water quality	
	Vegetation composition: area of vegetation communities	
	Vegetation composition: vegetation zonation	
	Vegetation structure: sward height	
	Typical species	
	Fringing habitats: area	
	Vegetation structure: turlough woodland	

5.2.5 River Suck Callows SPA

River Suck Callows SPA has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the QIs of the SPA, and state whether the QIs are favourable or unfavourable. These are summarised in **Table 5.7**.

Table 5.7	River	Suck	Callows \$	SPA
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QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Wigeon	Winter population trend	Unfavourable / Restore
Lapwing	Winter spatial distribution	
	Disturbance at wintering site	
	Barriers to connectivity and site use	
	Forage spatial distribution, extent and abundance	
	Roost spatial distribution and extent	
	Supporting habitat: area and quality	

5.2.6 River Shannon Callows SAC

River Shannon Callows SAC has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the QIs of the SAC, and state whether the QIs are favourable or unfavourable. These are summarised in **Table 5.8**.

Table 5.8: River Shannon Callows SAC

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Alkaline fens	Habitat area	Favourable / Maintain
	Habitat distribution	
	Ecosystem function: soil nutrients	
	Ecosystem function: peat formation	
	Ecosystem function: hydrology - groundwater levels	
	Ecosystem function: hydrology - surface water flow	
	Ecosystem function: water quality	
	Vegetation composition: community diversity	
	Vegetation composition: typical brown mosses	
	Vegetation composition: typical vascular plants	
	Vegetation composition: native negative indicator species	
	Vegetation composition: non- native species	
	Vegetation composition: native trees and shrubs	
	Vegetation composition: algal cover	
	Vegetation structure: vegetation height	
	Physical structure: disturbed bare ground	
	Physical structure: tufa formations	
	Indicators of local distinctiveness	
	Transitional areas between fen and adjacent habitats	
Alluvial forests with Alnus glutinosa and Fraxinus excelsior	Habitat area	Favourable / Maintain

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
(Alno-Padion, Alnion incanae, Salicion albae)	Habitat distribution Woodland size	
	Woodland structure: cover and height	
	Woodland structure: community diversity and extent	
	Woodland structure: natural regeneration	
	Hydrological regime: flooding depth/height of water table	
	Woodland structure: dead wood	
	Woodland structure: veteran trees	
	Woodland structure: indicators of local distinctiveness	
	Woodland structure: indicators of overgrazing	
	Vegetation composition: native tree cover	
	Vegetation composition: typical species	
	Vegetation composition: negative indicator species	
	Vegetation composition: problematic native species	
Otter	Distribution	Favourable / Maintain
	Extent of terrestrial habitat	
	Extent of freshwater (river) habitat	
	Couching sites and holts	
	Fish biomass available	
	Barriers to connectivity	

5.2.7 Middle Shannon Callows SPA

Middle Shannon Callows SPA has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the QIs of the SPA, and state whether the QIs are favourable or unfavourable. These are summarised in **Table 5.9**.

Table 5.9: Middle S	Shannon Ca	allows SPA
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QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Lapwing	Winter population trend	Unfavourable / Restore

QI	Attributes Defining Conservation Condition	Conservation Condition and Objective
Black-headed gull	Winter spatial distribution	
	Disturbance at wintering site	
	Barriers to connectivity and site use	
	Forage spatial distribution, extent and abundance	
	Roost spatial distribution and extent	
	Supporting habitat: area and quality	
Wetlands	Wetland habitat area	Favourable / Maintain
	Wetland habitat quality and functioning	

5.3 Step 2, Part 1: Effects on the Integrity of European Sites 'Alone'

5.3.1 Lough Ree SPA

5.3.1.1 Ecological Connectivity

Lough Ree SPA is located c. 1.9 km east of the project site. The QIs for this SPA with potential ecological connectivity to the project are: little grebe, whooper swan, wigeon, teal, mallard, tufted duck, coot and lapwing. **Section 3.2.2.2** above provides more information on the recorded activity of these species and **Table 3.2** gives information on ecological connectivity.

The substation and electrical apparatus could present collision risk to birds; however, this is highly unlikely. This is because the control building itself will be low in height (c. 8.5 m in height) and solid and static, and so will be easily visible to flying birds.

The interface masts will also be low in height (15 - 18 m in height) and there is an existing overhead transmission line present, with one of the wooden pole sets proposed to be replaced by one of the interface masts. This means there will no new overhead lines constructed. The underground nature of the electricity line will also not pose any collision risk to birds.

Thus, there will be no appreciable increase to the current level of collision risk presented to birds due to the proposed project, and collision risk can be excluded from further assessment.

Also, due to the small scale of the project, no barrier effects to birds will occur as there will be no appreciable increase in the energy expended to fly around the project, and barrier effects can be excluded from further assessment.

Disturbance and displacement during construction is the most likely potential impact to birds from the project. This is due to the increased presence of personnel and vehicles, which provide visual and aural disturbance stimuli. Once construction has been completed, these stimuli will reduce considerably in magnitude, as considerably fewer personnel and vehicles will be present. Birds will also become habituated to the static substation location, which will be screened via newly planted hedgerows and treelines, and the electricity line will be buried


underground. Therefore, disturbance and displacement during the operational phase is very unlikely and can be excluded from further assessment.

Goodship and Furness (2022) provide guidance on buffer distances required to avoid human disturbance to a range of bird species during breeding and non-breeding seasons. This guidance states that these distances provide a precautionary approach, recognising that the significance of disturbance activities may vary depending on species, habitat requirements of the species, time of year, time of day and topography. Thus, in certain circumstances, smaller buffers may be appropriate depending on the type of disturbing activity, duration, topography (or presence of screening features) and known levels of habituation.

Information on disturbance buffers required for QI birds for Lough Ree SPA with an ecological connection to the project site is provided below, along with an assessment of likely disturbance effects.

Little grebe

No information on disturbance buffers for little grebe is provided in Goodship and Furness (2022). Information is available for Slavonian grebe, which is a similar species whose disturbance buffer is likely to be like that for little grebe. The buffer required to avoid disturbance to Slavonian grebe in the non-breeding season is 150 – 350 m. Little grebe was recorded c. 290 m from the proposed substation and c. 200 m from the proposed electricity line route. These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are much greater in magnitude. In addition, works along the electricity line route are transient will are only likely to be undertaken within the disturbance buffer for several days.

The pond where little grebe were recorded along the electricity line route is also partially screened by hedgerows and houses.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for little grebe along the electricity line corridor. Impacts to little grebe due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south where visibility of the substation will be achievable.

Therefore, without mitigation, wintering little grebe that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

Whooper swan

Goodship and Furness (2022) state that the buffer required to avoid disturbance to whooper swan in the non-breeding season is 200 - 600 m. This species was recorded c. 450 m southwest from the proposed substation in the western turlough. This distance is smaller than the maximum buffer distance required to avoid disturbance to this species.

Whooper swan was not recorded near the proposed electricity line route. Impacts to whooper swan due to works along the route are excluded for the project alone.

The turlough southwest of the proposed substation is lower, in elevation, than the proposed substation location, with gappy treelines and hedgerows in between. The southwestern turlough is naturally screened from this location due to topography and linear habitat features to some extent, but not completely.

Therefore, without mitigation, wintering whooper swan that use the turloughs southwest of the proposed substation are at risk of disturbance and displacement.

Wigeon

Goodship and Furness (2022) state that the buffer required to avoid disturbance to wigeon in the non-breeding season is 200 – 500 m. This species was recorded c. 300 m south from the proposed substation in the western turlough and c. 200 m from the proposed electricity line route. These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation than along the cable corridor, as they are much greater in magnitude. In addition, works along the electricity line route are transient will are only likely to be undertaken within the disturbance buffer for several days.

The turloughs where wigeon were recorded along the electricity line route are also partially screened by hedgerows.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for wigeon along the electricity line corridor. Impacts to wigeon due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south.

Therefore, without mitigation, wintering wigeon that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

Teal

No information on disturbance buffers for teal is provided in Goodship and Furness (2022). Information available for other duck species is provided, whose disturbance buffers are likely to be like that for teal. The buffer required to avoid disturbance to other duck species in the non-breeding season is 100 – 200 m. Teal was recorded c. 270 m from the proposed substation and c. 120 m from the proposed electricity line route.

The distance to the proposed substation is larger than the maximum buffer distance required to avoid disturbance to this species. Therefore, impacts to teal due to works at the proposed substation are excluded for the project alone.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are greater in magnitude.

The pond where teal were recorded along the electricity line route is also partially screened by hedgerows and houses.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for teal along the electricity line corridor. Impacts to teal due to works along the electricity line corridor are excluded for the project alone.

Mallard

Goodship and Furness (2022) state that the buffer required to avoid disturbance to mallard in the non-breeding season is >100 m. This species was recorded c. 280 m south from the proposed substation in the southern turlough and c. 120 m from the proposed electricity line route. These distances are larger than the maximum buffer distance required to avoid disturbance to this species. Impacts to mallard due to works at the proposed substation and along the electricity line corridor are excluded for the project alone.

Tufted duck

No information on disturbance buffers for tufted duck is provided in Goodship and Furness (2022). Information available for other duck species is provided, whose disturbance buffers are likely to be like that for tufted duck. The buffer required to avoid disturbance to other duck species in the non-breeding season is 100 - 200 m. Tufted duck was recorded in the non-breeding season c. 220 m from the proposed substation and was not recorded along the proposed electricity line route. It was not recorded during the breeding season.

The distance to the proposed substation is larger than the maximum buffer distance required to avoid disturbance to this species. Therefore, impacts to tufted duck (both breeding and non-breeding populations) due to works at the proposed substation are excluded for the project alone.

As no tufted duck were recorded along the electricity line route, impacts to tufted ducks (both breeding and non-breeding populations) due to works along the electricity line corridor are excluded for the project alone.

Coot

No information on disturbance buffers for coot is provided in Goodship and Furness (2022). Information available for duck species is provided, whose disturbance buffers are likely to be like that for coot, given that they occupy a similar niche. The buffer required to avoid disturbance to a range of duck species in the non-breeding season is 100 – 200 m. Coot was recorded c. 260 m from the proposed substation and c. 100 m from the proposed electricity line route.

The distance to the proposed substation is larger than the maximum buffer distance required to avoid disturbance to this species. Therefore, impacts to coot due to works at the proposed substation are excluded for the project alone.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are much greater in magnitude.

The pond where coot was recorded along the electricity line route is also partially screened by hedgerows and houses.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for coot along the electricity line corridor. Impacts to coot due to works along the electricity line corridor are excluded for the project alone.

Lapwing

No information on disturbance buffers for lapwing is provided in Goodship and Furness (2022). Information available for other plover species is provided, whose disturbance buffers are likely to be like that for lapwing, given that they occupy a similar niche. The buffer required to avoid disturbance to a range of plover species in the non-breeding season is 200 – 500 m. Lapwing was recorded c. 240 m from the proposed substation and c. 200 m from the proposed electricity line route.

These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are much greater in magnitude.

The turlough where lapwing was recorded along the electricity line route is also partially screened by hedgerows.



Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for lapwing along the electricity line corridor. Impacts to lapwing due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south.

Therefore, without mitigation, wintering lapwing that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

5.3.2 Lough Ree SAC

5.3.2.1 Hydrogeological Connectivity

The only potential connection between the project and Lough Ree SAC is via groundwater flow paths in the underlying bedrock aquifer. As stated in **Appendix D**, the overall direction of groundwater flow is towards Lough Ree.

During construction, and to a lesser extent, during operation (in the form of routine maintenance) of the project, there is potential for the release of the following into the groundwater:

- suspended solids;
- nutrients; and
- other pollutants, (such as hydrocarbons, contaminated waste-water, and cementbased products).

All identified pathways outlined above have the potential to impact upon GWDTE habitat interest features of Lough Ree SAC i.e. alkaline fens, bog woodland, and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*.

5.3.3 Ballynamona and Corkip Lough SAC

The only potential connection between the project and Ballynamona and Corkip Lough SAC is via groundwater flow paths. As stated in **Appendix D**, there could be a groundwater connection from the project (specifically the proposed electricity line) and the SAC.

During construction of the project, there is potential for the release of the pollutants into the groundwater.

All identified pathways outlined above have the potential to impact upon GWDTE habitat interest features of Ballynamona and Corkip Lough SAC i.e. turloughs and bog woodland.

5.3.4 Castlesampson Esker SAC

The only potential connection between the project and Castlesampson Esker SAC is via groundwater flow paths. As stated in **Appendix D**, there could be a groundwater connection from the project (specifically the proposed electricity line) and the SAC.

During construction of the project, there is potential for the release of pollutants into the groundwater.

All identified pathways outlined above have the potential to impact upon GWDTE habitat interest features of Castlesampson Esker SAC i.e. turloughs.

5.3.5 River Suck Callows SPA

5.3.5.1 Ecological Connectivity

River Suck Callows SPA is located c. 8.8 km west of the project site. The QIs for this SPA with potential ecological connectivity to the project are: wigeon and lapwing. **Section 3.2.2.2** above provides more information on the recorded activity of these species and **Table 3.2** gives information on ecological connectivity.

As detailed above in **section 5.3.1.1**, collision risk and barrier effects during the operational phase are very unlikely and can be excluded from further assessment.

As detailed above in **section 5.3.1.1**, disturbance and displacement during construction is the most likely potential impact to birds from the project. Disturbance and displacement during the operational phase are very unlikely and can be excluded from further assessment.

Information on disturbance buffers required for QI birds for River Suck Callows SPA with an ecological connection to the project site is provided below, along with an assessment of likely disturbance effects.

Wigeon

Goodship and Furness (2022) state that the buffer required to avoid disturbance to wigeon in the non-breeding season is 200 – 500 m. This species was recorded c. 300 m south from the proposed substation in the western turlough and c. 200 m from the proposed electricity line route. These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation location than along the electricity line corridor, as they are much greater in magnitude.

The turloughs where wigeon were recorded along the electricity line route is also partially screened by hedgerows.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for wigeon along the electricity line corridor. Impacts to wigeon due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south.

Therefore, without mitigation, wintering wigeon that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

Lapwing

No information on disturbance buffers for lapwing is provided in Goodship and Furness (2022). Information available for other plover species is provided, whose disturbance buffers are likely to be like that for lapwing, given that they occupy a similar niche. The buffer required to avoid disturbance to a range of plover species in the non-breeding season is 200 – 500 m. Lapwing was recorded c. 240 m from the proposed substation and c. 200 m from the proposed electricity line route.

These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are much greater in magnitude.

The turlough where lapwing was recorded along the electricity line route is also partially screened by hedgerows.



Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for lapwing along the electricity line corridor. Impacts to lapwing due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south.

Therefore, without mitigation, wintering lapwing that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

5.3.6 River Shannon Callows SAC

5.3.6.1 Hydrological Connectivity

There is direct, downstream hydrological connectivity between the project site (electricity line) and the River Shannon Callows SAC (instream distance of 10.1 km). The Cross [Roscommon] River flows into the Shannon [Lower], which forms part of the SAC. Thus, the following effects could occur.

Water quality

During construction, and to a lesser extent, during operation (in the form of routine maintenance) of the project, there is potential for the release of:

- suspended solids;
- nutrients; and
- other pollutants, (such as hydrocarbons, contaminated waste-water, and cementbased products).

All identified pathways outlined above have the potential to impact upon the aquatic habitat interest features of the River Shannon Callows SAC i.e. alkaline fens, and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*.

Suspended solids could reduce water clarity lowering the ability of plants to photosynthesize, resulting in die back. The increased availability of nutrients can lead to algal blooms (eutrophication) which can also limit light penetration, reducing growth and causing the death of plants in littoral zones. Hydrocarbon pollution affects leaf biochemistry, leading to decline in productivity and die back of vegetation (Arellano, et al., 2015).

The hydrological connection is present for the electricity line only. Therefore, having regard to the characteristics of the construction activities in the vicinity of the Cross River; the quantities of suspended solids, nutrients and other pollutants that could be released at the project site are likely to be very small and subject to high levels of dilution in the river system. Moreover, the period for potential release of suspended solids will be temporary, occurring only during the construction works.

Invasive species

Japanese knotweed was present in the verge along the electricity line route and so could accidentally be spread if fragments entered the Cross [Roscommon] River during the construction of the project. Japanese knotweed is known to spread vegetatively when rhizome fragments are transported downstream (TII, 2020). This could negatively affect QI habitats by outcompeting native flora, especially habitats that are present near watercourses. Japanese knotweed can also interfere with water flow and can leave riverbanks exposed to erosion, leading to bank collapse (TII, 2020), both which could negatively affect QI habitats near watercourses.



Specifically, alkaline fens and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* could be negatively affected by the spread of Japanese knotweed within the River Shannon Callows SAC.

5.3.6.2 Ecological Connectivity

Otter signs were recorded downstream of location where the electricity line crosses the Cross [Roscommon] River. While no otter holts or couches were recorded within 150 m of the crossing, the Cross [Roscommon] River is suitable for foraging otters, and thus, this species could utilise aquatic and terrestrial habitats immediately adjacent to the project site (electricity line only).

There is a risk that an otter could become trapped in excavations on land if no appropriate exit is provided. If present within or nearby to the project, human activity could affect otter by disturbing and/or displacing individuals, preventing foraging and leading to a loss of condition. Also, the effects on water quality mentioned above could cause a reduction in prey species, which could prevent otter foraging and lead to a loss of condition.

5.3.7 Middle Shannon Callows SPA

5.3.7.1 Hydrological Connectivity

There is direct, downstream hydrological connectivity between the project site (electricity line) and the Middle Shannon Callows SPA (instream distance of 10.1 km). The Cross [Roscommon] flows into the Shannon [Lower], which forms part of the SPA.

Thus, effects on water quality and quantity could occur, along with negative effects from invasive species, such as Japanese knotweed.

These effects are the same as those described above in **section 5.3.6.1** for the River Shannon Callows SAC but apply to the Middle Shannon Callows SPA QI wetland habitat.

5.3.7.2 Ecological Connectivity

Middle Shannon Callows SPA is located c. 8.8 km southeast of the project site. The QIs for this SPA with potential ecological connectivity to the project are: black-headed gull and lapwing. **Section 3.2.2.2** above provides more information on the recorded activity of these species and **Table 3.2** gives information on ecological connectivity.

As detailed above in **section 5.3.1.1**, collision risk and barrier effects during the operational phase are very unlikely and can be excluded from further assessment.

As detailed above in **section 5.3.1.1**, disturbance and displacement during construction is the most likely potential impact to birds from the project. Disturbance and displacement during the operational phase are very unlikely and can be excluded from further assessment.

Information on disturbance buffers required for QI birds for River Suck Callows SPA with an ecological connection to the project site is provided below, along with an assessment of likely disturbance effects.

Lapwing

No information on disturbance buffers for lapwing is provided in Goodship and Furness (2022). Information available for other plover species is provided, whose disturbance buffers are likely to be like that for lapwing, given that they occupy a similar niche. The buffer required to avoid disturbance to a range of plover species in the non-breeding season is 200 – 500 m. Lapwing was recorded c. 240 m from the proposed substation and c. 200 m from the proposed electricity line route.



These distances are smaller than the maximum buffer distance required to avoid disturbance to this species.

The construction works are likely to be more disturbing at the proposed substation than along the electricity line corridor, as they are much greater in magnitude.

The turlough where lapwing was recorded along the electricity line route is also partially screened by hedgerows.

Therefore, due to this and the small-scale nature of the proposed works, disturbance and displacement is unlikely to be significant for lapwing along the electricity line corridor. Impacts to lapwing due to works along the electricity line corridor are excluded for the project alone.

The turlough immediately south of the proposed substation is lower, in elevation, than the proposed substation. Therefore, the northernmost part of the turlough is naturally screened from this location due to topography, but this effect decreases further south.

Therefore, without mitigation, wintering lapwing that use the turloughs south and southwest of the proposed substation are at risk of disturbance and displacement.

Black-headed gull

No information on disturbance buffers for black-headed gull is provided in Goodship and Furness (2022). Given that black-headed gulls are frequently observed at active landfills where a high degree of disturbance is present (Cook, et al., 2008), a precautionary buffer of 100 m has been assumed to avoid disturbance in the non-breeding season. Black-headed gull was recorded c. 170 m from the proposed substation and c. 185 m from the proposed electricity line route. These distances are larger than the maximum buffer distance required to avoid disturbance to this species.

Impacts to black-headed gull due to works at the proposed substation and along the electricity line corridor are excluded for the project alone.

5.4 Step 2, Part 2: Effects on the Integrity of European Sites 'In Combination'

5.4.1 Projects

A desktop-based planning search spanning 10 years was undertaken to identify projects that could give rise to 'in combination' effects on the European sites assessed in **section 5.3**.

For animal QI species, the search radius from each European site extended to the maximum territory size or core foraging distance. Details are shown below:

- River Shannon Callows SAC: the QI where significant effects are predicted for the project 'alone' is otter. Maximum otter territory size is 13.2 km. Therefore, a search length of 13.2 km of watercourses entering the River Shannon Callows SAC was made. Projects adjacent to watercourses were focused on, as the QI species is not likely to be present far from watercourses, precluding possible cumulative effects;
- Lough Ree SPA: the QI where significant effects are predicted for the project 'alone' with the largest core foraging distance is little grebe. Therefore, a search radius for projects within 20 km of Lough Ree SPA was made. Projects located in wetland areas were focused on, as the QI species with predicted significant effects are not likely to be present in other areas, precluding possible cumulative effects;
- River Suck Callows SPA: the QI where significant effects are predicted for the project 'alone' with the largest core foraging distance is lapwing. Therefore, a search radius for projects within 12 km of River Suck Callows SPA was made. Projects located in



wetland areas were focused on, as the QI species with predicted significant effects not likely to be present in other areas, precluding possible cumulative effects; and

 Middle Shannon Callows SPA: the QI where significant effects are predicted for the project 'alone' with the largest core foraging distance is lapwing. Therefore, a search radius for projects within 12 km of River Suck Callows SPA was made. Projects located in wetland areas were focused on, as the QI species with predicted significant effects are not likely to be present in other areas, precluding possible cumulative effects.

For habitats, the search radius extended to the maximum instream distance where pollutants were likely to have an appreciable effect on the relevant European sites. Details are shown below:

• River Shannon Callows SAC and Middle Shannon Callows SPA: the qualifying and QIs where significant effects are predicted are alkaline fens and alluvial forests; and wetland habitats, respectively. **Appendix D** confirmed that pollutants are likely to dilute after 10 km, so a search along 10 km sections of watercourses entering this SAC and SPA was made. While it is recognised that other projects could be release a larger volume of pollutants that could travel over longer instream distances, the very low chance of the project releasing pollutants into the SAC and SPA, means this search area is appropriate.

Sources consulted included the EIA portal, EPA map viewer, An Bord Pleanála, Roscommon County Council, Westmeath County Council, Offaly County Council, Tipperary County Council, Longford County Council and Galway County Council planning lists.

The list of planning applications focussed on:

- Developments mentioned in consultation responses (Table 2.1);
- All infrastructural projects which are operational and utilising the same road networks that are proposed by the project;
- All planning applications within the search area outlined above where the planning status is to be determined, or where the construction period would likely coincide with the construction period of the project;
- Facilities with an Industrial Emissions Licence (IEL) connected to the European site via a watercourse;
- Urban Waste Water (UWW) treatment plants connected to the European site via a watercourse;
- Facilities with Section 4 Discharge Licences connected to the European site via a watercourse;
- All quarries within 2 km of the application boundary;
- The list of project for 'in-combination' assessment from Chapter 1 of the accompanying EIAR 'Introduction' is also included.

The planning applications returned from the desktop search are summarised in **Table 5.10** below.

Table 5.10: Other Projects Considered for 'In Combination' Effects

Development Name	Description	Planning Reference
Seven Hills Wind Farm	Permitted development of a 17 no. turbine wind farm and	An Bord Pleanála Reference ABP-313750-22

Development Name	Description	Planning Reference
	associated ancillary infrastructure	
Eirgrid Athlone to Lanesborough 110 kV line upgrade	Existing overhead Electricity Transmission Line between the 110kV electricity substations at Athlone and Lanesborough	N/A
Mannion Quarries	Existing quarry activities at a 4.8 ha site	Roscommon County Council Planning Register References 01/113 and 05/811
Cam Quarry	Existing quarry at a c. 68 ha site with associated operations	Roscommon County Council Planning Register References 04/1479 and 08/393
Ward Bros. Quarries	Existing quarry on a c. 16 hectare site and associated operations	Roscommon County Council Planning Register References 08/998 and 09/143
Lecarrow Quarries	Existing quarry and ancillary operations	Roscommon County Council Planning Register References 02/36, 03/979 and 18/118
Alexion Pharma International	Existing development consisting of the provision of a new warehouse with ancillary accommodation and a loading bay	Roscommon County Council Planning Register Reference 22/2
Roadstone Ltd	Proposed infilling and restoration of a previous sand and gravel extraction site	Roscommon County Council Planning Register Reference 23/60269
Kildea Concrete	Proposed development consisting of the extraction of sand, stone and gravel over a site area of 6.9 ha	Roscommon County Council Planning Register Reference 22/526 (An Bord Pleanála Reference ABP-317704-23)
Telecommunications masts	Existing and permitted	Various
Agricultural developments	Existing, permitted and proposed	Various
Residential dwellings	Existing, permitted and proposed	Various
Commercial forestry plantations	Existing	N/A
West Offaly Power Station	Permitted demolition of disused power station and associated infrastructure and development of 75 MW battery energy storage system.	Offaly County Council Planning Register Reference PL2/22/223
Ray Walshe	Permitted erection of steel storage shed next to Lough Ree	Longford County Council Planning Register Reference 2460116
Jazz Pharmaceuticals Ireland Ltd	IEL	Licence number P0987-01
Monksland Wastewater Treatment Works	UWW	Licence number D0042-01



Development Name	Description	Planning Reference
Athlone	UWW	Licence number D0007-01
James Duffy & Sons	Section 4 Discharge	Licence number ENV W01/2014
Clonmacnoise Visitors Centre (OPW)	Section 4 Discharge	Licence number WP/W27/10
Ballisaloe Town and Environs	UWW	Licence number D0032-01
Western Health Board	Section 4 Discharge	Licence number W005/78
Ferbane	UWW	Licence number D0147-01
Electricity Supply Board	IEL	Licence number P1198-01
Cloghan	UWW	Licence number D0369-01
Banagher	UWW	Licence number D0141-01
Banagher Concrete	Section 4 Discharge	Licence number WP/W9/10

5.4.2 Plans

The following plans have been reviewed and taken into consideration:

- National Biodiversity Action Plan 2023-2030 (NPWS, 2023);
- Northern and Western Regional Spatial and Economic Strategy 2020-2032 (RSES) (Government of Ireland, 2020);
- Roscommon County Development Plan 2022-2028 (Roscommon County Council, 2022);
- Westmeath County Development Plan 2021-2027 (Westmeath County Council, 2021);
- Offaly County Development Plan 2021-2027 (Offaly County Council, 2021);
- Tipperary County Development Plan 2022-2028 (Tipperary County Council, 2022);
- Longford County Development Plan 2021-2027 (Longford County Council, 2021); and
- Galway County Development Plan 2022-2028 (Galway County Council, 2022).

The review examined policies and objectives relating to designated sites for nature conservation, biodiversity, protected species, conservation of peatlands, sustainable land use, and preservation of surface water quality.

Key policies and development allocations are summarised in Table 5.11.

Table 5.11: Assessment of Relevant Plans

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
National Biodiversity Action Plan 2023- 2030	2A2 NPWS will publish detailed site-specific conservation objectives, along with the approach used, for all existing SACs and SPAs	Not applicable.
	2A3 NPWS and relevant stakeholders will implement the conservation measures necessary to achieve the conservation objectives for Natura 2000 sites, and will develop and implement additional measures as necessary, to contribute towards achieving favourable conservation status nationally	
	2A4 NPWS, after consultation with other relevant bodies, will complete a review of its licencing and consent systems to facilitate sustainable activities within Natura 2000 sites	
	2A5 NPWS will publish and implement Species Action or Threat Response Plans with population targets for threatened and endangered species that are in unfavourable status or have declining trends	
	2A7 Údarás na Gaeltachta will undertake a review of estates and lands within their operational zones, with a view to creating site specific management plans; identifying areas within or ecologically connected to Natura 2000 lands to support delivery on the conservation objectives of these sites; identifying lands suitable for inclusion in the All-Ireland Pollinator Plan and potentially become a partner in the plan; identifying lands suitable for Biodiversity Corridors, imitating the structure and diversity of native vegetation	
	2C6 NPWS will implement the restoration/rewetting actions set out in the National Raised Bog Special Areas of Conservation Management Plan 2017-2022, in Ireland's 2023 Climate Action Plan and will also escalate blanket bog restoration	
	2H4 NPWS in collaboration with all relevant stakeholders will resource and implement onthe-ground actions to control, manage and where possible and feasible, eradicate occurrences of invasive	

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	alien species, including the removal of stands of invasive species from Protected Areas and National Parks 4C1 Monitoring of habitats and species listed on the EU Nature Directives will be continued and enhanced where required by NPWS and DECC	
Northern and Western Regional Spatial and Economic Strategy 2020-2032	 RPO 5.4 Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy. RPO 5.5 Conserve and protect European sites and their integrity. RPO 5.7 Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate. 	Not applicable.
Roscommon County Development Plan 2022-2028	 NH10.7 Implement Article 6(3) and where necessary Article 6(4) of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. NH10.8 Ensure that no plans, programmes, etc. or projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects). NH10.9 Ensure that any plan or project that could have a significant adverse impact (either alone or in combination with other plans and projects) upon the conservation objectives of any Natura 2000 Site or would result in the deterioration of any habitat or any species 	No development allocations identified within the development plan were found to occur within the wider area surrounding the project site. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects throughout the County. There is a village plan for Brideswell (which overlaps with the electricity line corridor) with the following objectives: Brideswell DO 1 To facilitate quality low density residential development at appropriate locations within the village settlement boundary and subject to adequate servicing arrangements. Brideswell DO 2 To support the provision of local and community services which can assist in sustaining and developing a resident community. Brideswell DO3 To encourage opportunities for employment generation through appropriate developments, commensurate

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	reliant on that habitat will not be permitted unless in exceptional circumstances. NH10.11 Preserve and protect sites of county geological importance from inappropriate development where they comprise designated sites or national heritage areas.	with the scale of the village, and in accordance with the principles of proper planning and sustainable development.
	NH10.19 Ensure that the county's watercourses are retained for their biodiversity and flood protection values and to conserve and enhance where possible, the wildlife habitats of the County's rivers and riparian zones, lakes, canals and streams which occur outside of designated areas to provide a network of habitats and biodiversity corridors throughout the county. The Council shall be available to engage with the NPWS with the objective of facilitating the monitoring and surveying of wetland sites in Roscommon.	
Westmeath County Development Plan 201-2027	It is a policy objective of Westmeath County Council to: CPO 12.4 Protect and conserve Special Areas of Conservation, candidate Special Areas of Conservation, Special Protection Areas and candidate Special Protection Areas, designated under the EU Birds and Habitats Directives respectively. CPO 12.5 Ensure that no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects). Footnote: Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place. CPO 12.6 Ensure that any plan or project that could have a significant adverse impact (either by themselves or in combination with other plans and projects) upon the conservation objectives of	No development allocations identified within the development plan can occur within the wider area surrounding the project site, as the project is in a different county. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects on European sites throughout the County.

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	any Natura 2000 Site or would result in the deterioration of any habitat or any species reliant on that habitat will not be permitted.	
	Footnote: Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place.	
	CPO 12.7 Assess any plan or project in accordance with Article 6 of the Habitats Directive to determine whether the plan or project is likely to have a significant effect on the site either individually or cumulatively upon the integrity, conservation objectives and qualifying interest of any Natura 2000 Site	
	CPO 12.8 Require an ecological appraisal for development not directly connected with or necessary to the management of Natura Sites, or a proposed Natura Site and which are likely to have significant effects on that site either individually or cumulatively.	
	CPO 12.9 Identify and provide appropriate buffer zones between Designated Sites and local biodiversity features and areas zoned for development.	
	CPO 12.10 Prepare Strategic Habitat Management Plans for Natura 2000 Sites in Council ownership in consultation with the National Parks and Wildlife Service and relevant stakeholders.	
	CPO 12.11 Promote the maintenance and as appropriate, achievement of favourable conservation status of habitats and species and to improve the ecological coherence of the Natura 2000 network, by maintaining and where appropriate, developing features in the landscape which are of major importance for wild fauna and flora.	
	CPO 12.12 Require that new development proposals affecting designated sites have regard to the sensitivities identified in the SEA Environmental Report prepared in respect of this plan.	
	CPO 12.24 Protect and where possible enhance biodiversity and ecological connectivity, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands,	

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	geological and geo-morphological systems, other landscape features, natural lighting conditions, and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive. Appropriate mitigation and/or compensation to conserve biodiversity, landscape character and green infrastructure networks will be required where habitats are at risk or lost as part of a development.	
Offaly County Development Plan 2021-2027	 NHP-01 It is Council policy to prohibit any development that would be harmful to or that would result in a significant deterioration of habitats and/or disturbance of species in a Special Protection Area (SPA), Special Area of Conservation (SAC) and candidate Special Area of Conservation (cSAC), Natural Heritage Area (NHA) and Proposed Natural Heritage Area (pNHA). NHP-08 It is Council policy to protect, conserve and enhance the county's biodiversity and natural heritage including wildlife (flora and fauna), habitats, landscapes and/or landscape features of importance to wildlife or which play a key role in the conservation and management of natural resources such as water 	No development allocations identified within the development plan can occur within the wider area surrounding the project site, as the project is in a different county. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects on European sites throughout the County.
	NHP-11 It is Council policy to conserve, protect and enhance where possible wildlife habitats such as rivers, streams, canals, lakes, and associated wetlands including reed-beds and swamps, ponds, springs, bogs, fens, trees, woodlands and scrub, hedgerows and other boundary types such as stone walls and ditches which occur outside of designated areas providing a network of habitats and corridors essential for wildlife to flourish.	
	NHP-12 It is Council policy to ensure that peatland areas, which are designated for protection under international and national legislation, are conserved and managed appropriately to conserve their ecological, archaeological, cultural and educational significance.	
	NHP-22 It is Council policy to encourage, pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries, important for the	

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	 ecological coherence of the Natura 2000 site(s) network and essential for the migration, dispersal and genetic exchange of wild species. NHP-24 It is Council policy to protect, conserve and enhance the county's biodiversity and natural heritage including wildlife (flora and fauna), habitats, landscapes and / or landscape features of importance to wildlife or which play a key role in the conservation and management of natural resources such as water. NHO-01 It is an objective of the Council to ensure that any development proposal in the vicinity of, or affecting a designated site, complies with the provisions relating Appropriate Assessment and SEA requirements and the Council will consult with the appropriate statutory environmental authority in this regard. NHO-02 It is an objective of the Council to conserve and protect the natural heritage of the county and to conserve and protect European and National designated sites within the county including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs), Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Ramsar Sites, Statutory Nature Reserves, Biogenetic Reserves and Wildfowl Sanctuaries 	
Tipperary County Development Plan 2022-2028	It is the policy of the Council to: 11 – 1: In assessing proposals for new development to balance the need for new development with the protection and enhancement of the natural environment and human health. In line with the provisions of Article 6(3) and Article 6 (4) of the Habitats Directive, no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects).	No development allocations identified within the development plan can occur within the wider area surrounding the project site, as the project is in a different county. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects on European sites throughout the County.

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	11 - 2: Ensure the protection, integrity and conservation of European sites and Annex I and II species listed in EU Directives. Where it is determined that a development may individually, or cumulatively, impact on the integrity of European sites, the Council will require planning applications to be accompanied by a NIS in accordance with the Habitats Directive and transposing Regulations, 'Appropriate Assessment of Plans and Projects, Guidelines for Planning Authorities', (DEHLG 2009) or any amendment thereof and relevant Environmental Protection Agency (EPA) and European Commission guidance documents.	
Longford County Development Plan 2021-2027	It is the County Policy Objective to: CPO 12.5 Protect and conserve the conservation value of Special Areas of Conservation, candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas and any other sites that may be proposed for designation during the lifetime of this Plan CPO 12.6 Ensure that no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects). Except as provided for in Article 6(4) of the Habitats Directive; in so far as there must be – (a) no alternative solution available, (b) imperative reasons of an overriding public interest for the project to proceed; and (c) Adequate compensatory measures in place CPO 12.7 Ensure that any plan or project that could have a significant adverse impact (either by themselves or in combination with other plans and projects) upon the conservation objectives of any Natura 2000 Site or would result in the deterioration of any	No development allocations identified within the development plan can occur within the wider area surrounding the project site, as the project is in a different county. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects on European sites throughout the County.

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	Except as provided for in Article 6(4) of the Habitats Directive; in so far as there must be – (a) no alternative solution available (b) imperative reasons of an overriding public interest for the project to proceed; and (c) Adequate compensatory measures in place.	
	CPO 12.8 Ensure that all development proposals relating to European Sites will comply with the DoECLG publication 'Appropriate Assessment of Plans and Projects in Ireland- Guidance for Planning Authorities'	
	CPO 12.9 Ensure an Appropriate Assessment is carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on the integrity of a European Site(s), either individually or in-combination with other plans or projects, in view of the site's conservation objectives to comply with the Habitats Directive.	
	CPO 12.10 Permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves or those proposed to be designated over the period of the Plan, only where an appropriate level of assessment can clearly demonstrate that it will have no significant adverse effect on the integrity of the site.	
	CPO 12.11 Consult and have regard to the views and guidance of the National Parks and Wildlife Service in respect of proposed development where there is a possibility that such development may have an impact on a designated European or National site, or a site proposed for such designation.	
	CPO 12.12 Identify and provide appropriate buffer zones between Designated Sites and local biodiversity features and areas zoned for development	
	CPO 12.13 Undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) subject to available resources.	

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	CPO 12.14 Prepare Strategic Habitat Management Plans for European Sites in the County in consultation with the National Parks and Wildlife Service and relevant stakeholders.	
	CPO 12.15 Require an ecological appraisal, in addition to an Appropriate Assessment, for development not directly connected with or necessary to the management of European Sites, or a proposed European Site and which are likely to have significant effects on that site either individually or cumulatively.	
	CPO 12.16 Ensure that no plan, programme, or project giving rise to significant cumulative, direct , indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air) , transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan, either individually or in combination with other plans, programmes, etc. or projects.	
	Footnote: Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place.	
	CPO 12.18 Where surveys carried out for the preparation of Environmental Impact Assessment (EIA/EcIA)/ Natura Impact Statement or other assessments generate biodiversity data previously unknown or unrecorded in the County this data be submitted to the National Biodiversity Data Centre (NDBC)	
Galway County Development Plan	NHB 1: Natural Heritage and Biodiversity of Designated Sites, Habitats and Species	No development allocations identified within the development plan can occur within the wider area surrounding the project
2022-2028	Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan.	site, as the project is in a different county. However, the plan provides a framework for land use developments and activities with potential for construction and operation source effects on European sites throughout the County.

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976- 2010 and the Flora Protection Order (SI 94 of 1999).	
	Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network.	
	NHB 2: European Sites and Appropriate Assessment	
	To implement Article 6 of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. All such projects and plans will also be required to comply with statutory Environmental Impact Assessment requirements where relevant.	
	NHB 3: Protection of European Sites	
	No plans, programmes, or projects etc. giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air),transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects. NHB 4: Ecological Appraisal of Biodiversity	
		1

Plan	Policies for the Protection of European Sites	Development Allocations with Potential for In Combination Effects
	Ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites. Where appropriate require an ecological appraisal, for development not directly connected with or necessary to the management of European sites, or a proposed European site and which are likely to have significant effects on that site either individually or cumulatively	

5.4.3 Lough Ree SPA

The construction of the project, most notably the substation may result in disturbance and displacement of ex situ little grebe, whooper swan, wigeon and lapwing from Lough Ree SPA.

The construction, operation and decommissioning of the permitted Seven Hills Wind Farm, infrastructure and quarries could result in in-combination effects, particularly for projects nearby wetland areas where these QIs are present. This impact arises if the other projects are scheduled to be constructed or decommissioned at the same time as this project, effectively reducing the extent of ex situ supporting habitat.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects are within 12 km of the SPA site and have wetland habitats suitable for little grebe, whooper swan, wigeon and lapwing: permitted Seven Hills wind farm, and Ray Walshe (steel storage shed erection).

5.4.4 Lough Ree SAC

The primary pathway identified that could affect Lough Ree SAC is through a reduction in groundwater quality. Any construction projects with hydrogeological connectivity to the SAC have the potential to have an in-combination effect with the project, if they also have a negative effect on groundwater quality. This could occur if other projects are timed to be constructed or decommissioned at the same time as those construction activities for the project, producing a decline in water quality, or in series, with an ongoing reduction in water quality.

This could affect GWDTE QI habitats including alkaline fens, bog woodlands and alluvial forests.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects have hydrogeological connectivity to the SAC: permitted Seven Hills Wind Farm, Eirgrid Athlone to Lanesborough 110 kV line upgrade, Lecarrow Quarries, Roadstone Ltd and Kildea Concrete.

5.4.5 Ballynamona and Corkip Lough SAC

The primary pathway identified that could affect Ballynamon and Corkip Lough SAC is through a reduction in groundwater quality. Any construction projects with hydrogeological connectivity to the SAC have the potential to have an in-combination effect with the project, if they also have a negative effect on groundwater quality. This could occur if other projects are timed to be constructed or decommissioned at the same time as those construction activities for the project, producing a decline in water quality, or in series, with an ongoing reduction in water quality.

This could affect GWDTE QI habitats including turloughs and, bog woodlands.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects have hydrogeological connectivity to the SAC: permitted Seven Hills Wind Farm, Eirgrid Athlone to Lanesborough 110 kV line upgrade, Lecarrow Quarries, Roadstone Ltd and Kildea Concrete.

5.4.6 Castlesampson Esker SAC

The primary pathway identified that could affect Castlesampson Esker SAC is through a reduction in groundwater quality. Any construction projects with hydrogeological connectivity to the SAC have the potential to have an in-combination effect with the project, if they also have a negative effect on groundwater quality. This could occur if other projects are timed to be constructed or decommissioned at the same time as those construction activities for the project, producing a decline in water quality, or in series, with an ongoing reduction in water quality.

This could affect GWDTE QI habitats including turloughs.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects have hydrogeological connectivity to the SAC: permitted Seven Hills Wind Farm, Eirgrid Athlone to Lanesborough 110 kV line upgrade, Lecarrow Quarries, Roadstone Ltd and Kildea Concrete.

5.4.7 River Suck Callows SPA

The construction of the project, most notably the substation may result in disturbance and displacement of ex situ wigeon and lapwing from River Suck Callows SPA.

The construction, operation and decommissioning of the permitted Seven Hills Wind Farm, infrastructure and quarries could result in in-combination effects, particularly for projects nearby wetland areas where these QIs are present. This impact arises if the other projects are scheduled to be constructed or decommissioned at the same time as this project, effectively reducing the extent of ex situ supporting habitat.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. There following projects are within 12 km of the SPA site that have wetland habitats suitable for wigeon and lapwing: permitted Seven Hills wind farm.

5.4.8 River Shannon Callows SAC

The primary pathway identified that could affect the River Shannon Callows SAC is through a reduction in water quality. Any construction projects with hydrological connectivity to the SAC have the potential to have an in-combination effect with the project, if they also have a negative effect on water quality. This could occur if other projects are timed to be constructed or decommissioned at the same time as those construction activities for the project, producing a decline in water quality, or in series, with an ongoing reduction in water quality.

This could affect downstream habitats such as alkaline fens or alluvial forests, and prey for mobile otter.

Furthermore, activities undertaken during the construction of the project and particularly the electricity line, could result in disturbance to otter. Other projects in the vicinity of the project site, if constructed / decommissioned at the same time as this project, could result in incombination effects.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects have hydrological connectivity to the SAC and / or are closer to the SAC than the maximum otter territory size (13.2 km): permitted Seven Hills Wind Farm,



Mannion Quarries, West Offaly Power Station, Jazz Pharmaceuticals Ireland Ltd, Monksland Wastewater Treatment Works, Athlone UWW, James Duffy & Sons, Clonmacnoise Visitors Centre (OPW), Ballisaloe Town and Environs UWW, Western Health Board, Ferbane UWW, Electricity Supply Board IEL, Cloghan UWW, Banagher UWW, and Banagher Concrete.

It should be noted that the permitted Seven Hills Wind Farm has a downstream hydrological connection to the SAC via the permitted grid connection infrastructure and not via the main wind farm itself.

5.4.9 Middle Shannon Callows SPA

The construction of the project, most notably the substation may result in disturbance and displacement of ex situ lapwing from Middle Shannon Callows SPA.

The construction, operation and decommissioning of the permitted Seven Hills Wind Farm, infrastructure and quarries could result in in-combination effects, particularly for projects nearby wetland areas where this QI is present. This impact arises if the other projects are scheduled to be constructed or decommissioned at the same time as this project, effectively reducing the extent of ex situ supporting habitat.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects are within 12 km of the SPA site and have wetland habitats suitable for lapwing: permitted Seven Hills wind farm and West Offaly Power Station.

There is hydrological connectivity between the SPA and the project site via the Cross [Roscommon] River. In absence of mitigation, suspended solids, nutrients and other pollutants generated during the construction of the project could cause a reduction in water quality in the SPA. Any construction projects hydrologically connected to the SPA could have an in-combination effect with the project if they also negatively impact water quality. This impact arises if the other projects are scheduled to be constructed or decommissioned at the same time as this project, resulting in declines in water quality, or in series, producing a continuing reduction in water quality.

It can be expected that all such projects and plans will be subject to an NIS assessment under the Habitats and Birds Directives. These have been examined where possible for the projects identified and a summary of the conclusions and mitigation are presented in **Table 5.12**. The following projects have hydrological connectivity to the SPA: permitted Seven Hills wind farm, Mannion Quarries, West Offaly Power Station, Jazz Pharmaceuticals Ireland Ltd, Monksland Wastewater Treatment Works, Athlone UWW, James Duffy & Sons, Clonmacnoise Visitors Centre (OPW), Ballisaloe Town and Environs UWW, Western Health Board, Ferbane UWW, Electricity Supply Board IEL, Cloghan UWW, Banagher UWW, and Banagher Concrete.

Note that the permitted Seven Hills wind farm has a downstream hydrological connection to the SPA via the grid route and not via the main wind farm itself.

Table 5.12: Summary of NIS Conclusions and Mitigation for other Identified Projects

Project	NIS Conclusions	Mitigation Measures Summary	Source
Seven Hills Wind Farm	It can be objectively concluded, following an examination, analysis and evaluation of the relevant information, including in particular the nature of predicted impacts from the Proposed Development, and with the implementation of mitigation measures proposed, that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site and there is no reasonable scientific doubt in relation to this conclusion.	 Water quality Potential deterioration of water quality was only considered possible for the grid connection and not the main wind farm itself. Mitigation measures included: Mitigation by design; Avoidance of watercourse crossing methods that require instream works; Pre-construction drainage inspections; Construction phase drainage management; Operational phase drainage inspection; Pre-emptive site drainage management; Pre-emptive site drainage management; Reactive site drainage management; Cable trend drainage; CEMP to avoid release of hydrocarbons; Cement based products control measures; Monitoring; and 	MKO (2022) Natura Impact Statement (NIS) Report Proposed Seven Hills Wind Farm, Co. Roscommon

Project	NIS Conclusions	Mitigation Measures Summary	Source
		Spill control measures.	
		Otter disturbance / displacement	
		Otter disturbance was only considered possible for the grid connection and not the main wind farm itself.	
		Mitigation measures included:	
		• Pre-construction otter survey undertaken by a qualified ecologist; and	
		• Any holts encountered within 150 m of the watercourse crossing will be subject to exclusion procedures and a derogation licence applied for if any works are judged likely to cause disturbance to otter.	
		Bird disturbance / displacement	
		Bird disturbance was not brought forward for detailed assessment in the NIS and so no mitigation measures were required.	
Eirgrid Athlone to Lanesborough 110 kV line upgrade	No NIS was produced but the results of the AA Screening have been shown below instead.	No NIS was produced.	EirGrid (2023) Appropriate Assessment Screening Determination:
	In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations		CP1430 Lanesboro 110kV Station Works [Exempted Development] County Longford
	2011 SI 477 as amended, EirGrid has made a Determination following screening that an Appropriate Assessment is not required as the		Site Investigation Works for CP1311 Athlone- Lanesboro- 110 kV OHL [Exempted Development] Counties Longford and Roscommon

Project	NIS Conclusions	Mitigation Measures Summary	Source
	project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.		
Mannion Quarries	No AA screening or NIS was produced. No significant residual effects on birds, otter or downstream European sites were predicted in the EIS.	No AA screening or NIS was produced. No specific mitigation measures for birds, otter or downstream European sites were provided in the EIS.	EarthSciences Partnership Ireland Ltd (2001) Environmental Impact Statement
Cam Quarry	No AA screening or NIS was produced. No significant residual effects on birds, otter or downstream European sites were predicted in the EIS.	No AA screening or NIS was produced. No specific mitigation measures for birds, otters or downstream European sites were provided in the EIS.	Roadstone Provinces Ltd (2004) Environmental Impact Statement
Ward Bros. Quarries	No AA screening or NIS was produced. No significant residual effects on birds, otter or downstream European sites were predicted in the EIS. No significant residual effects on birds, otter or downstream European	No AA screening or NIS was produced. No specific mitigation measures for birds, otter or downstream European sites were provided in the EIS.	Whitehill Environmental (2008) Ecological Report on the Lands at Lisnagirra, Athleague, Co. Roscommon
	sites were predicted.		
Lecarrow Quarries	No AA screening or NIS was produced.	No AA screening or NIS was produced.	Roscommon County Council Planning Portal
Alexion Pharma International	No AA screening or NIS was produced in the EIS. No significant residual effects on birds, otter or downstream European sites were predicted in the ELAP	No AA screening or NIS was produced. No specific mitigation measures for birds, otter or downstream European sites were provided in the EIAR.	AWN Consulting (2021) Environmental Impact Assessment Report



Project	NIS Conclusions	Mitigation Measures Summary	Source
Roadstone Ltd	No NIS was produced but the results of the AA Screening have been shown below instead.	No NIS was produced.	Roscommon County Council (2023). Appropriate Assessment Screening Report
	Following an assessment of the proposed development and any potential relationships with European Sites, it is concluded that either alone or in combination with other plans or projects, there would be no likely significant effects on any European Sites.		
Kildea Concrete	No NIS was produced but the results of the AA Screening have been shown below instead.	No NIS was produced.	Roscommon County Council (2023). Appropriate Assessment Screening Report
	There is no likelihood of significant effects and no adverse impacts to site integrity are predicted, due to the nature of the works proposed. It is not considered that there will be any loss of habitat with any European Sites, nor any loss of any qualifying Annex 1 habitat outside designated sites.		
West Offaly Power Station	It is considered that the proposed project at WOP station, Shannonbridge, Co. Offaly, either alone or in-combination, will have no adverse effects on the integrity of River Shannon Callows SAC or Middle Shannon Callows SPA. Based on the information set out in this report as well as the other documents accompanying the	 Water quality Surface water management during demolition and construction Surface water management during operation Dust suppression Pollution prevention Sediment barriers 	APEM (2022) Appropriate Assessment Screening and Natura Impact Statement

Project	NIS Conclusions	Mitigation Measures Summary	Source
	planning application, we submit that the competent authority has sufficient information to allow them to determine, with reasonable scientific certainty, that the proposed project, individually or in combination with other plans or projects, will have no adverse effect on the integrity of any Natura 2000 site.		
Ray Walshe	Stringent measures have been specified (Section 8) and it is considered that with the application of these measures there will be no significant effect on these European sites, qualifying interest or conservation objectives either alone or in-combination with other plans or projects	 Water quality Surface water management during demolition and construction Surface water management during operation Dust suppression Pollution prevention Sediment barriers 	Hayes (2024) Appropriate Assessment Screening and Natura Impact Statement
Projects with an IEL, UWW or Section 4 discharge licences (Jazz Pharmaceuticals Ireland Ltd, Monksland Wastewater Treatment Works, Athlone UWW, James Duffy & Sons, Clonmacnoise Visitors Centre (OPW), Ballisaloe Town and Environs UWW, Western Health Board, Ferbane UWW, Electricity Supply Board IEL, Cloghan UWW, Banagher UWW, and Banagher Concrete)	These projects are tightly regulated and licenced, so that any discharge into surface or groundwater protects the receiving environment.	Water quality Measures implemented as part of IEL, UWW or Section 4 discharge licence conditions	EPA

For all the identified projects where an NIS / environmental report was available, the projects incorporated significant mitigation to prevent adverse impacts on the designated features of European sites.

5.5 Step 2, Part 3: Implications for the Conservation Objectives

5.5.1 Lough Ree SPA

The unmitigated risks for the project to undermine the draft conservation objectives of Lough Ree SPA are set out below.

The project may present a disturbance / displacement risk to little grebe, whooper swan, wigeon and lapwing. This could undermine the objectives to maintain favourable conservation condition for little grebe and whooper swan, and to restore favourable conservation condition for wigeon and lapwing.

This is only likely to occur if the turloughs south of the project site represent important supporting habitat for a significant number of QI birds, such that loss of this habitat could result in loss of condition, along with subsequent increased mortality.

The peak numbers of little grebe, whooper swan, wigeon and lapwing recorded using the turloughs south of the project site were 2, 14, 84 and 120 birds, respectively. These numbers represent 3.7%, 7.2%, 31.1% and 9.4% of the Lough Ree SPA population as defined by the latest IWeBS counts⁴, respectively.

A 1% threshold is generally accepted to represent a significant proportion of a population (Holt, et al., 2012). Therefore, the little grebe, whooper swan, wigeon and lapwing recorded immediately south of the project site represent significant proportions of the Lough Ree SPA population.

However, the SPA is very large and there are numerous wetlands surrounding it that offer alternative foraging habitats. Any disturbance / displacement is also likely to be limited to the construction phase of the project only, which is short-term in duration. There is also some natural screening in the way of topography for part of the southern turlough, and topography plus treelines for the southwestern turlough. The turloughs also are adjacent to a busy agricultural unit and so background levels of disturbance are already high, suggesting that the birds have habituated to a certain level of traffic and human presence.

During operation, it is likely birds would be habituated to the presence of the substation and so any disturbance / displacement effects would be reversible, and unlikely to translate into significant mortality effects to the SPA populations.

Therefore, for the project alone, it is considered that the risk of undermining the conservation objectives for little grebe, whooper swan, wigeon and lapwing is **low**.

Given the separation distances between the project site and other projects that could act to cause disturbance / displacement to QIs, in-combination the risk of undermining the conservation objectives is also **low**.

In the absence of mitigation, the project could release suspended sediment, nutrients and other pollutants into groundwater connected with the SPA, resulting in a deterioration of groundwater quality and increase in nutrients to QI wetland habitats. As described in **Appendix D**, even in the absence of mitigation, this is considered unlikely and the risk of undermining the conservation objectives is **very low**. In-combination, the risk of undermining the conservation objectives is also **very low**.

5.5.2 Lough Ree SAC

The unmitigated risks for the project to undermine the conservation objectives of Lough Ree SAC are set out below in **Table 5.13**.

Table 5.13: Unmitigated Risk of Undermining the Conservation Objectives of Lough Ree SAC

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
Maintain the following for alkaline fen:habitat area; andhabitat distribution.	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 11.5 km from the project site, so habitat area and distribution will not be affected.	No risk
 Maintain the following for alkaline fen: hydrological regime; peat formation; and water quality: nutrients. 	Very low risk Unmitigated, the project could release suspended sediment, nutrients and other pollutants into groundwater connected with the SAC, resulting in a deterioration of groundwater quality and increase in nutrients. In Appendix D , even in the absence of mitigation, this is considered unlikely.	Very low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
 Maintain the following for alkaline fen: vegetation structure: typical species; vegetation composition: trees and shrubs; physical structure: drainage; and physical structure: disturbed bare ground. 	formation or groundwater levels. Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 11 km from the project site boundary. Therefore, there will be no direct impact to vegetation composition, drainage or the presence of bare ground. There is no downstream hydrological connection and so spread of invasive species is highly unlikely.	Low risk
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Paldio, Alnion incanae and Salicion albae)	There are no conservation objectives associated with this QI.	There are no conservation objectives associated with this QI.
Restore the following for bog woodland: • habitat area; and • habitat distribution.	No risk There are no works proposed within the SAC and the closest known location of this habitat is	No risk

,	Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
		approximately 14.7 km from the project site, so habitat area and distribution will not be affected.	
Res woo	store the following for bog odland: vegetation composition: positive indicator species; and vegetation composition: negative indicator species.	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 14.7 km from the project site boundary. Therefore, there will be no direct impact to vegetation composition. There is no downstream hydrological connection and so spread of invasive species is highly unlikely.	Low risk
Res woo	store the following for bog odland: Woodland structure: cover and height of birch; Woodland structure: dwarf shrub cover; Woodland structure: ling cover; Woodland structure: bryophyte cover; Woodland structure: tree class; and Woodland structure: senescent and dead wood.	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 14.7 km from the project site boundary. Therefore, there will be no direct impact to woodland structure.	Low risk

5.5.3 Ballynamona and Corkip Lough SAC

The unmitigated risks for the project to undermine the conservation objectives of Ballynamona and Corkip Lough SAC are set out below in **Table 5.14**.

Table 5.14: Unmitigated Risk of Undermining the Conservation Objectives ofBallynamona and Corkip Lough SAC

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Restore the following for turloughs: habitat area; and habitat distribution; and fringing habitats: area. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 1.3 km from the project site, so habitat area and distribution will not be affected.	No risk

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Restore the following for turloughs: soil type: area; soil nutrient status: nitrogen and phosphorus; and physical structure: bare ground. 	Very low risk Unmitigated, the project could release suspended sediment, nutrients and other pollutants into groundwater connected with the SAC, resulting in a deterioration of groundwater quality and increase in soil nutrients. In Appendix D , even in the absence of mitigation, this is considered unlikely. There will be no effect on physical structure or area of soil type.	Very low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
 Restore the following for turloughs: hydrological regime: flood duration, frequency, area, depth; permanently flooded area; chemical processes: calcium carbonate deposition and concentration; water quality: nutrients; colour; phytoplankton; epiphyton; and 	Very low risk Unmitigated, the project could release suspended sediment, nutrients and other pollutants into groundwater connected with the SAC, resulting in a deterioration of groundwater quality. In Appendix D, even in the absence of mitigation, this is considered unlikely. There will be no effect on peat formation, chemical processes or hydrological regime.	Very low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
active peat formation.		
 Restore the following for turloughs: vegetation composition: area of vegetation communities; vegetation composition: vegetation zonation; vegetation structure: sward height; typical species: terrestrial, wetland and aquatic plants, invertebrates and birds; and vegetation structure: turlough woodland 	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 1.3 km from the project site boundary. Therefore, there will be no direct impact to vegetation composition, structure and typical species. There is no downstream hydrological connection and so spread of invasive species is highly unlikely.	Low risk
Restore the following for bog woodland:habitat area; andhabitat distribution.	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 1.3 km from the project site, so habitat area and distribution will not be affected.	No risk

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Restore the following for bog woodland: vegetation composition: positive indicator species; and vegetation composition: negative indicator species. 	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 1.3 km from the project site boundary. Therefore, there will be no direct impact to vegetation composition.	Low risk
	There is no downstream hydrological connection and so spread of invasive species is highly unlikely.	
 Restore the following for bog woodland: Woodland structure: cover and height of birch; Woodland structure: dwarf shrub cover; Woodland structure: ling cover; Woodland structure: bryophyte cover; Woodland structure: tree class; and Woodland structure: senescent and dead wood. 	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 1.3 km from the project site boundary. Therefore, there will be no direct impact to woodland structure.	Low risk

5.5.4 Castlesampson Esker SAC

The unmitigated risks for the project to undermine the conservation objectives of Castlesampson Esker SAC are set out below in **Table 5.15**.

Table 5.15: Unmitigated Risk of Undermining the Conservation Objectives of
Castlesampson Esker SAC

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Restore the following for turloughs: habitat area; and habitat distribution; and fringing habitats: area. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 4.2 km from the project site, so habitat area and distribution will not be affected.	No risk
Restore the following for turloughs: • soil type;	Very low risk Unmitigated, the project could release suspended sediment,	Very low but slightly increased risk

	Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
•	soil nutrient status: nitrogen and phosphorus; and physical structure: bare ground.	nutrients and other pollutants into groundwater connected with the SAC, resulting in a deterioration of groundwater quality and increase in soil nutrients. In Appendix D , even in the absence of mitigation, this is considered unlikely.	Construction and / or decommissioning works at other project sites add to the risk from the project alone.
		There will be no effect on physical structure or area of soil type.	
Re	Restore the following for	Very low risk	Very low but slightly
turl • •	oughs: hydrological regime; chemical processes: calcium carbonate deposition and concentration; water quality; and active peat formation.	Unmitigated, the project could release suspended sediment, nutrients and other pollutants into groundwater connected with the SAC, resulting in a deterioration of groundwater quality. In Appendix D , even in the absence of mitigation, this is considered unlikely. There will be no effect on peat formation, chemical processes or bydrological regime	increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
Re	store the following for	Low risk	Low risk
turl	oughs:	There are no works proposed	
•	area of vegetation communities;	within the SAC and the closest known location of this habitat is approximately 4.2 km from the	
•	vegetation composition: vegetation zonation;	project site boundary. Therefore, there will be no	
•	vegetation structure: sward height;	direct impact to vegetation composition, structure and twical species	
•	typical species; and	There is no downstream	
•	vegetation structure: turlough woodland	hydrological connection and so spread of invasive species is highly unlikely.	

5.5.5 River Suck Callows SPA

The unmitigated risks for the project to undermine the conservation objectives of River Suck Callows SPA are set out below in **Table 5.16**.
Table 5.16: Unmitigated Risk of l	Indermining the Conservation Objectives of River
Suck Callows SPA	

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 To restore the following for wigeon: winter population trend; winter spatial distribution; lack of disturbance at wintering sites; lack of barriers to connectivity and site use; forage spatial distribution, extent and abundance; roost spatial distribution and extent; and supporting habitat: area and quality. 	Low risk There are no works proposed within this SPA, so there will be no effect on winter spatial distribution, wintering sites, connectivity and site use, foraging extent and abundance, and roost distribution and extent within the SPA itself. Significant disturbance at important areas for foraging and roosting outside the SPA could reduce the area and quality of these supporting habitats. This could in turn cause negative effects on the winter population trend and spatial distribution. The peak numbers of wigeon and lapwing recorded using the turloughs south of the project site was 84 birds. This represents .2.9% of the River Suck Callows SPA population (2,857 birds) as defined by the latest IWeBS counts ⁴ . This represents a significant proportion of the SPA population. The SPA is very large with a large number of ex situ wetland habitats surrounding it. Therefore, there is a low risk that disturbance / displacement of undermining	Low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
	the conservation objectives for wigeon.	
 To restore the following for lapwing: winter population trend; winter spatial distribution; lack of disturbance at wintering sites; lack of barriers to connectivity and site use; forage spatial distribution, extent and abundance; roost spatial distribution and extent; and 	Low risk There are no works proposed within this SPA, so there will be no effect on winter spatial distribution, wintering sites, connectivity and site use, foraging extent and abundance, and roost distribution and extent within the SPA itself. Significant disturbance at important areas for foraging and roosting outside the SPA could reduce the area and quality of	Low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.

Conservation Objective (Summary)		For the Project Alone	For the Project In Combination with Other Plans and Projects
•	supporting habitat: area and quality.	could in turn cause negative effects on the winter population trend and spatial distribution.	
		The peak numbers of lapwing recorded using the turloughs south of the project site was 120 birds. This represents 8.8% of the River Suck Callows SPA population (1,368 birds) as defined by the latest IWeBS counts ⁴ .	
		This does represent a significant proportion of the SPA population. The SPA is very large with a large number of ex situ wetland habitats surrounding it. Therefore, there is a low risk that disturbance / displacement of undermining the conservation objectives for lapwing.	

5.5.6 River Shannon Callows SAC

The unmitigated risks for the project to undermine the conservation objectives of River Shannon Callows SAC are set out below in **Table 5.17**.

Table 5.17: Unmitigated Risk of Undermining the Conser	vation Objectives of River
Shannon Callows SAC	-

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Maintain the following for alkaline fen: habitat area; and habitat distribution. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 42 km from the project site, so habitat area and distribution will not be affected.	No risk
 Maintain the following for alkaline fen: ecosystem function: soil nutrients; ecosystem function: peat formation; ecosystem function: hydrology – groundwater levels; 	Very low risk Unmitigated, the project could release suspended sediment, nutrients and other pollutants into watercourses hydrologically connected with the SAC, resulting in a deterioration of water quality and increase in soil nutrients. In Appendix D , a conservative dilution assessment determined that there is effectively no potential	Very low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.

Conservation Objective (Summary)		For the Project Alone	For the Project In Combination with Other Plans and Projects	
•	ecosystem function: hydrology – surface water flow; and ecosystem function: water quality.	for significant effects to extend beyond an instream distance of c. 7.5 km from the Cross River crossing, c. 2.3 km upstream of the SAC.		
		Due to the distance between the SAC and the project site, there is no risk of increased water flow due to increased run- off from surfaced areas within the project site.		
		There will be no effect on peat formation or groundwater levels.		
Ma alk	intain the following for aline fen:	Low risk	Low risk	
•	vegetation composition: community diversity;	within the SAC and the closest known location of this habitat is		
•	vegetation composition: typical brown mosses;	approximately 42 km from the project site boundary.		
•	vegetation composition: typical vascular plants;	Therefore, there will be no direct impact to vegetation		
•	vegetation composition: native negative indicator species;	Japanese knotweed was recorded adjacent to the		
•	vegetation composition: non-native species;	electricity line route; however, this was located at 3.4 km from		
•	vegetation composition: native trees and shrubs;	construction personnel could accidentally spread rhizome		
•	vegetation composition: algal cover; and	fragments along the electricity line route and into the Cross		
•	vegetation structure: vegetation height.	[Roscommon] River. If viable, the fragments could enter the SAC and displace other plants, negatively affecting vegetation composition.		
Ma alki	intain the following for aline fen:	No risk	No risk	
•	physical structure: disturbed bare ground: and	There are no works proposed within the SAC and the closest known location of this habitat is		
•	physical structure: tufa formations.	approximately 42 km from the project site, so habitat area and distribution will not be affected.		
Ma alki	intain the following for aline fen	No risk	No risk	
•	indicators of local distinctiveness; and transitional cross between	There are no works proposed within the SAC and the closest known location of this habitat is approximately 42 km from the		
	fen and adjacent habitats.	project site, so habitat area and distribution will not be affected.		

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
 Maintain the following for alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Paldio, Alnion incanae and Salicion albae): habitat area; and habitat distribution. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 29 km from the project site, so habitat area and distribution will not be affected.	No risk
 Maintain the following for alluvial forests with <i>Alnus</i> <i>glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Paldio, Alnion incanae</i> <i>and Salicion albae</i>): woodland size; woodland structure: cover and height; woodland structure: natural regeneration; woodland structure: dead wood; woodland structure: veteran trees; woodland structure: veteran trees; and woodland structure: indicators or local distinctiveness; and woodland structure: indicators of overgrazing. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 29 km from the project site, so woodland size and structure will not be affected.	No risk
 Maintain the following for alluvial forests with <i>Alnus</i> <i>glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Paldio, Alnion incanae</i> <i>and Salicion albae</i>): hydrological regime: flooding depth / height of water table. 	No risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 29 km from the project site, so woodland size and structure will not be affected. Risks as a result of temporary lowering of groundwater levels during substation construction was excluded as impacts will be localised and very unlikely to be perceptible beyond 50 m of the excavation.	No risk
 Maintain the following for alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Paldio, Alnion incanae and Salicion albae): vegetation composition: native tree cover; 	Low risk There are no works proposed within the SAC and the closest known location of this habitat is approximately 29 km from the project site boundary. Therefore, there will be no	Low risk

	Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
•	vegetation composition: typical species; vegetation composition: negative indicator species; and vegetation composition: problematic native species.	direct impact to vegetation composition. Japanese knotweed was recorded adjacent to the electricity line route; however, this was located at 3.4 km from any watercourse. Unmitigated, construction personnel could accidentally spread rhizome fragments along the electricity line route and into the Cross River. If viable, the fragments could enter the SAC and displace other plants, negatively affecting vegetation composition.	
Ma • •	intain the following for otter: distribution; extent of terrestrial habitat; extent of freshwater (river) habitat; couching sites and holts; and lack of barriers to connectivity.	Low risk There will be no works within the SAC. The project site is hydrologically connected with the SAC via the Cross [Roscommon] River. No spraints, couching sites or holts were recorded within 150 m of the Cross [Roscommon] River watercourse crossing, so couching site and holts will not be affected. Spraints were recorded 2.8 km downstream, suggesting the watercourse provides suitable foraging habitat for otter. Activities undertaken during construction activities at the watercourse crossing could result in disturbance and displacement of otter associated with the SAC. This could negatively affect distribution, extent of terrestrial habitat, extent of freshwater habitat and provide a temporary barrier to connectivity. This is not considered to be likely as this species not known to be sensitive to disturbance (Chanin, 2003).	Low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
Ma •	intain the following for otter: fish biomass available.	Low risk Water pollution via suspended sediment could negatively affect fish spawning gravels.	Low but slightly increased risk Construction and / or decommissioning works at other

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
	vegetation or invertebrates that fish forage on. This could result in a reduction in fish biomass available. While the risk of water pollution entering the SAC is very low, ex situ otters could travel up the Cross [Roscommon] River where the risk of negative effects of water pollution would be slightly higher.	project sites add to the risk from the project alone.

5.5.7 Middle Shannon Callows SPA

The unmitigated risks for the project to undermine the conservation objectives of Middle Shannon Callows SPA are set out below in **Table 5.18**.

Table 5.18: Unmitigated Risk of Undermining the Conservation Objectives of Middle Shannon Callows SPA

	Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
To lap • • •	restore the following for wing: winter population trend; winter spatial distribution; lack of disturbance at wintering sites; lack of barriers to connectivity and site use; forage spatial distribution, extent and abundance; roost spatial distribution and extent; and supporting habitat: area and quality.	Low risk There are no works proposed within this SPA, so there will be no effect on winter spatial distribution, wintering sites, connectivity and site use, foraging extent and abundance, and roost distribution and extent within the SPA itself. Significant disturbance at important areas for foraging and roosting outside the SPA could reduce the area and quality of these supporting habitats. This could in turn cause negative	Low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.
		trend and spatial distribution. The peak numbers of lapwing and lapwing recorded using the turloughs south of the project site was 120 birds. This represents 5.6% of the Middle Shannon Callows SPA population (2,159 birds) as defined by the latest IWeBS counts ⁴ . This does represent a significant proportion of the SPA population. The SPA is very	

Conservation Objective (Summary)	For the Project Alone	For the Project In Combination with Other Plans and Projects
	large with a large number of ex situ wetland habitats surrounding it. Therefore, there is a low risk that disturbance / displacement of undermining the conservation objectives for lapwing.	
 To maintain the following for wetland habitats: wetland habitat area; and wetland habitat quality and functioning. 	Very low risk Unmitigated, the project could release suspended sediment, nutrients and other pollutants into watercourses hydrologically connected with the SPA, resulting in a deterioration of water quality and increase in soil nutrients, which could affect wetland habitat quality and functioning. In Appendix D , a conservative dilution assessment determined that there is effectively no potential for significant effects to extend beyond an instream distance of c. 7.5 km from the Cross [Roscommon] River crossing, c. 2.3 km upstream of the SPA. Due to the distance between the SPA and the project site, there is no risk of increased water flow due to increased run- off from surfaced areas within the project site. There will be no effect on wetland habitat area, quality	Very low but slightly increased risk Construction and / or decommissioning works at other project sites add to the risk from the project alone.

5.6 Step 3: Effects on the Integrity of the European Sites

5.6.1 Lough Ree SPA

Without mitigation, there is a low risk of having an adverse effect on the integrity of Lough Ree SPA during construction works because of disturbance / displacement of little grebe, whooper swan, wigeon and lapwing.

5.6.2 Lough Ree SAC

Without mitigation, there is a very low risk of having an adverse effect on the integrity of the Lough Ree SAC during construction works because of the release of suspended solids and / or other pollutants into groundwater.

5.6.3 Ballynamona and Corkip Bog SAC

Without mitigation, there is a very low risk of having an adverse effect on the integrity of the Ballynamona and Corkip Lough SAC during construction works because of the release of suspended solids and / or other pollutants into groundwater.

5.6.4 Castlesampson Esker SAC

Without mitigation, there is a very low risk of having an adverse effect on the integrity of the Castlesampson Esker SAC during construction works because of the release of suspended solids and / or other pollutants into groundwater.

5.6.5 River Suck Callows SPA

Without mitigation, there is a low risk of having an adverse effect on the integrity of River Suck Callows SPA during construction works because of disturbance / displacement of wigeon and lapwing.

5.6.6 River Shannon Callows SAC

Without mitigation, there is a very low risk of having an adverse effect on the integrity of the River Shannon Callows SAC during construction works because of the release of suspended solids and / or other pollutants.

There is a low risk of having an adverse effect on the integrity of the River Shannon Callows SAC during construction works because of the spread of non-native invasive species.

There is also a low risk of having an adverse effect on the integrity of the River Shannon Callows SAC during construction because of disturbance / displacement of otter, and the reduction of prey biomass due to the release of suspended solids and / or other pollutants.

5.6.7 Middle Shannon Callows SPA

Without mitigation, there is a low risk of having an adverse effect on the integrity of Middle Shannon Callows SPA during construction works because of disturbance / displacement of lapwing.

There is a very low risk of having an adverse effect on the integrity of Middle Shannon Callows SPA during construction because of the release of suspended solids and / or other pollutants.

5.7 Step 4: Mitigation Measures

5.7.1 Construction

Details of mitigation measures that will be implemented during the construction phase are provided below, with an outline CEMP provided in **Appendix E**.

5.7.1.1 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only present during certain months of the year, and



does not exist between ~May–November, thus construction proposed between May-November will not affect the turlough.

The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

Mitigation by Design

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.

Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;
- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;
- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;
- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change

- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

Silt Fences

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Storage Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works

Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Weather monitoring is a key input to the successful management of the drainage and treatment system during the construction of the substation. This, at a minimum, will involve 24-hour advance meteorological forecasting linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 5-year storm event), planned responses should be undertaken. These responses will involve control measures including the cessation of construction until the storm event has passed over and flood flows have subsided. Dedicated construction personnel should be assigned to monitor the weather.

Monitoring

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

Settlement ponds will require inspected and cleaning when necessary. This will be carried out under low or no flow conditions so as not to contaminate the clean effluent from the pond. The water level would first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment would then be removed by a mechanical excavator and disposed of in areas designated for the deposition of spoil.

Underground Electricity Line

The majority of the underground electricity line is >50 m from any nearby watercourse. The only section within 50 m of a watercourse is at the crossing over the Cross (Roscommon) River. This is an existing crossing along a public road and it is proposed to limit any works in this area including the stockpiling of excavated soils and subsoils.

No in-stream works are required at the crossing location; however, due to the proximity of the river to the construction works, there is a potential for surface water quality impacts during trench excavation work. Mitigation measures which are outlined above will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse.

Furthermore, working near watercourses along the underground electricity line during or after intense or prolonged rainfall events will be avoided.

Specific mitigation measures relating to the directional drilling at the crossing location are detailed in section 5.7.1.7.

5.7.1.2 Groundwater Flows and Levels due to Alteration of Recharge Rates

The critical driver of groundwater levels and the likelihood of affecting them is through groundwater recharge. The drainage design of the project has been designed to mimic the existing hydrological regime within the site, whereby surface water pathways are generally short and rainfall readily percolates to ground. The drainage design incorporates check dams to reduce velocities, and outflow from the drains being dispersed over a wide area of vegetation.

The net effect of the drainage design will be that all rainfall falling within the electricity substation site will remain on the site and infiltrate to ground and will not exit the site as runoff to surface watercourses.

Having regard to the characteristics of the underground electricity line, no mitigation measures are required in relation to the maintenance of recharge rates.

Groundwater Levels due to Excavation Works

Whilst the electricity substation site is mapped to be underlain by a Regionally Important Karstified Aquifer, there is little likelihood of effects for the following reasons:-

- The shallow nature of the proposed excavations (c. 0-2 m);
- The lack of any shallow groundwater inflows in the trial pits;
- No bedrock excavations are proposed;

- The local bedrock comprises generally hard limestone and dolomitic limestone and has been shown to be generally unproductive during site investigations;
- No regional groundwater flow regime, i.e. large volumes of groundwater flow, will be encountered at these elevations (as proven by the site investigation drilling);
- Shallow groundwater inflows, should they occur, will largely be fed by recent rainfall, and possibly by limited seepage from localised permeable subsoils;
- Any shallow groundwater seepage (within the subsoils) will be small in comparison to the expected surface water flows following any heavy rainfall events; and,
- The management of surface water will form the largest proportion of water to be managed and treated, although where permeable subsoils are encountered, rainfall may infiltrate to ground rather than ponding at any excavation.

Direct rainfall and surface water runoff will be the main inflows that will require water volume and water quality management. For the avoidance of doubt, we would generally define dewatering as a requirement to permanently drawdown the local groundwater table by means of over pumping, e.g. as would be required for the operation of a bedrock quarry in a valley floor.

Therefore, it is assessed that no mitigation measures are necessary regarding groundwater levels.

Meanwhile, the underground electricity line trench depth will be approximately 1.2 m in depth, the excavation will be temporary and transient, and the trench will be backfilled with imported aggregates and resurfaced with bituminous material. Therefore, there will be no net loss of permeability. As a result, and given the shallow depth, it is assessed that no mitigation measures are required regarding groundwater levels.

5.7.1.3 Surface Watercourses

The primary mitigating factor in relation to downgradient surface water bodies is the distinct lack of surface watercourses which drain the electricity substation site and the surrounding area. The rainfall falling on the site recharges to the underlying groundwater aquifer. There are no small streams (10-50 l/s) which would typically be seen on upland slopes.

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment.

5.7.1.4 Accidental Release of Hydrocarbons

Mitigation measures to avoid the release of hydrocarbons at the project site are as follows:

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;

- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan (see Appendix E). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

5.7.1.5 Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

5.7.1.6 Release of Cement-Based Products

Mitigation by Avoidance

The following mitigation measures are proposed:-

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);
- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

5.7.1.7 Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- There will be no storage of material/equipment or overnight parking of machinery inside a 15 m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15 m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;

- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50 m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100 m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;

- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

5.7.1.8 Birds

Disturbance is predicted to have the greatest effect on wintering QI birds (little grebe, whooper swan, wigeon and lapwing) that use the turloughs south and south-west of the proposed substation during construction.

The potential for breeding birds to use the improved agricultural fields where the proposed substation will be located is very low, given the intensive cattle grazing that occurs. Therefore, general mitigation measures will be required to avoid disturbance to breeding birds only.

The electricity line will be buried within existing roads and will not require any loss of uncultivated vegetation to accommodate this, although small amounts of hedgerow trimming may be required at the site entrance to the electricity substation. Disturbance to wintering birds along the electricity line route is not predicted due to the lower magnitude of potential disturbance stimuli and presence of natural screening features.

The following will be implemented to avoid disturbance to birds during the breeding season:

- Access will be restricted to the footprint of the proposed works corridor;
- Any trimming of uncultivated vegetation i.e. trees and hedgerows will be undertaken outside the main breeding season (March to September inclusive);
- If other clearance and construction activities are required to take place during the main breeding bird season, pre-commencement survey work will be undertaken to ensure that nest destruction and disturbance is avoided;
- Once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase e.g. cover for ground nesting species will be made unsuitable for cutting vegetation or tracking over with an excavator; and
- a suitably experienced Ecologist will be employed for the duration of the construction period to make contractors aware of the ornithological sensitivities of the project and to undertake surveys for nesting birds throughout the construction period, enforcing exclusion areas as required.

Mitigation measures to avoid disturbance to wintering waders and wildfowl have been developed using the TIDE toolbox (TIDE, 2024), which is a best-practice toolkit that has been developed to avoid disturbance to waders and wildfowl at foraging and roosting locations. The following will be implemented to avoid disturbance to birds during the non-breeding season at the substation location:-

- Most construction (or the most disturbing aspects) at the electricity substation will be undertaken during the breeding season months (April to August inclusive), insofar as possible, to minimise disturbance to non-breeding IEF wildfowl and waders;
- However, as the construction phase is predicted to last 15-18 months, works will be required to be undertaken during the non-breeding season. Prior to the



commencement of the non-breeding season (or prior to construction, as appropriate), temporary barriers will be erected to provide acoustic and visual screening of the substation and access track to the substation prior to the non-breeding season, which will remain in place until construction works cease or the end of the non-breeding season (whichever is sooner). The barrier will consist of wooden boarding approximately 5m tall and will face the turloughs to the south and southwest of the substation location. This will reduce the magnitude of high disturbance stimuli (e.g. sudden loud noises, continuous loud noises, workers operating outside of plant and, workers vacating plant), which could otherwise cause disturbance and displacement to birds. The barrier will be erected in such a way that no destruction of existing stonewalls, hedgerows or treelines will occur;

- Where screening cannot be implemented along the access road to the proposed substation farm, construction personnel must stay within their vehicles and ensure that vehicles travel slowly and quietly, without coming to a halt; and
- Bird monitoring will be undertaken throughout the construction phase during the nonbreeding season by a suitability experienced Ecologist. This will be used to check that actions/measures to avoid disturbance are being undertaken correctly and that remedial actions can be implemented if required. The bird monitoring during the nonbreeding season will be focused at the turlough locations south and south-west of the proposed substation and will involve conducting fortnightly wader and wildfowl feeding distribution surveys between October to March inclusive. The locations of little grebe, whooper swan, wigeon and lapwing within 500 m of the turloughs will be recorded, as well as any responses to disturbance stimuli.

5.7.1.9 Otter

A pre-construction walkover survey of the project will be undertaken. This will search for otter holts/couches, which could change over time. If any are identified, then appropriate exclusion zone(s) will be implemented and construction activities timed to avoid sensitive periods, such as the breeding season. The following will be implemented to reduce the possibility of direct and indirect effects on otters:

- Limiting constructions works to daylight hours;
- Providing exit points for any excavations (e.g. escape planks or spoil runs) so otters do not become trapped; and
- A suitably qualified Ecologist will be employed for the duration of the construction period to make contractors aware of the otter sensitivities of the project and to undertake surveys for breeding or resting otters throughout the construction period, enforcing exclusion areas (150 m) as required. If in the unlikely event that exclusion zones cannot be implemented, advice will be sought from NPWS, and appropriate mitigation and compensation measures will be put in place and an application will be made to NPWS for a derogation licence if required.

5.7.1.10 Invasive and Non-Native Species

The following will be implemented to avoid the accidental spread of any invasive or nonnative species:

- An invasive species management plan will be developed and implemented. This will include the following general prevention and containment measures and species-specific treatment measures below;
- A suitably qualified Ecologist will be employed for the duration of the construction period to make contractors aware of any invasive and non-native species sensitivities



of the project and to undertake pre-construction surveys, enforcing any exclusion zones and mitigation measures as required.

General Prevention Measures

- Use of toolbox talks as part of site introduction to workers, including what to look out for and what procedures to follow if invasive species are observed;
- Signs will be used to warn workers of invasive species contamination;
- Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;
- Unwanted material contaminated with invasive species will be transported off-site by an appropriate licenced waste contractor and disposed of at a suitably licenced facility (NRA, 2010) guidelines; and
- Good hygiene practices will be adhered to including the removal of build-up of soil on equipment; keeping equipment clean; washing vehicles exiting the site using a pressure washer to prevent the transport of seeds; storing wastewater from washing facilities securely and treating to prevent spread of invasive species; checking footwear and clothing of workers for seeds, fruits or other viable material before leaving the site; any plant material arising from cleaning equipment, footwear and clothing will be carefully disposed of following (NRA, 2010) guidelines in such a manner not to cause the spread of invasive species.

General Containment Measures

- A pre-construction walkover survey of the project will be undertaken during the growing season (April to August). This will search for invasive and non-native species, which could change over time. The extent of invasive plant species will be physically marked out; and
- If any are identified, then appropriate exclusion zone(s) will be implemented. A 1 m buffer (except for the named species below) will be used to cordon off invasive species outside the works footprint.

Japanese knotweed

Japanese knotweed code of practice

To help developers, consultants, and contractors to select the most appropriate treatment option, some excerpts from the Knotweed Code of Practice (UK Environment Agency, 2013) are reproduced below. The code of practice has been developed by experts in the control of Japanese knotweed and is based on the successes and failures of several Japanese knotweed management plans in the United Kingdom, which is also relevant for Ireland. Therefore, it represents the best available guidance on the different treatment options.

- "Unless an area of Japanese knotweed is likely to have a direct impact on the development, control it in its original location with herbicide over a suitable period of time, usually two to five years;
- Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum;
- Soil containing Japanese knotweed material may be buried on the site where it is produced to ensure that you completely kill it. Bury material at least 5 m deep;
- Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This 'buys time' for



treatment that would not be possible where the Japanese knotweed was originally located;

- Due to timing, location, landfill is the only reliable option, but it should be treated as a last resort. Landfill can be expensive and would require haulage, which would increase the risk of Japanese knotweed spreading; and
- When transporting soil infested with Japanese knotweed to landfill, it is essential to carry out strict hygiene measures. If these standards are not followed, this may result in the spread of this invasive species. Japanese knotweed is a particular problem along transport routes/corridors, where it can interfere with the line of vision and can potentially result in traffic accidents."

Information is also provided by the Transport Infrastructure Ireland (TII) (TII, 2020), and Invasive Species Ireland (ISI) (ISI, 2015) in relation to identification, control and eradication of Japanese knotweed.

Exclusion zone

Prior to the construction phase / excavations at the site, the following bio-security measures will be in place:

- A 7 m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;
- Where part of the exclusion zone encroaches onto an active public access, or beyond a site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary;
- The exclusion zone will be delineated with a secure temporary construction fence, such as herras panels or timber post and netting, and be fitted with appropriate warning / advisory signage;
- Fencing will remain in place for the duration of construction works; and
- Signs will be placed on the fence to advise site personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force.

Chemical control

The use of physical methods on their own are extremely unlikely to control Japanese knotweed and so chemical treatment is recommended.

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with a combination of physical and herbicide control over a period (typically 3-5 years, or until no new growth is observed). The control of Japanese knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. To ensure the safety of herbicide applicators and of other public users of the site, it is essential that a competent and qualified person carries out the herbicide treatment. A qualified and experienced contractor will be employed to carry out all treatment work. The contractor will follow the detailed recommendations of the following documents for the control of invasive species and noxious weeds:

- Chapter 7 and Appendix 3 of the TII Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010);
- Best Practice Management Guidelines for Japanese Knotweed (ISI, 2015); and
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese



knotweed plants identified within the Site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese knotweed; however, they may also persist in the soil and/or kill surrounding vegetation.

Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment Agency, 2003), so this is the recommended treatment if knotweed is found within 20 m of the Cross [Roscommon] River.

The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within one to two years, whereas non-persistent herbicides (such as glyphosate) may take over a period of at least three years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any re-growth.

Such treatment can take up to five years to completely eradicate growth; therefore, further treatment may be required beyond the three years. This will be determined by the results of the monitoring. Japanese knotweed does not produce viable seed in Ireland, and therefore seed germination in subsequent years will not be an issue. The optimal period for treatment is May-June and September-October.

Montbretia

The following treatment options are recommended by TII (2020) guidance.

Chemical control

Montbretia can be treated with herbicide during the active growing season. Due to the potential for re-infestation from seeds, corms and/or rhizome fragments, regular monitoring and follow-up treatment, as dictated by the monitoring, will be required over several years. If found near a watercourse crossing, similar bioactive-formulation glyphosate-based herbicide treatment is recommended as for Japanese knotweed (see above).

Physical control

Physical control of montbretia is difficult as individual corms easily break from their chains and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried or disposed of to a licensed landfill or incineration facility under licence. The most effective time to remove montbretia is before the flowering/seeding season. The corms are very hardy and are not suitable for composting. Due to the potential for re-infestation from corms, regular follow-up will be required over several years to deal with any re-growth.

Snowberry

As snowberry is present within hedgerows in third-party lands, the primary means of preventing spread will be avoidance.

In the event of interaction of works with snowberry, excavation of the entire root system is recommended, in addition to the general prevent and containment measures outlined earlier.

This must be done before the plants' seeds ripen in autumn and plant matter from this process can be disposed of at a licenced landfill site or may be buried on-site up to a depth of >2 m.

5.7.2 Operation

5.7.2.1 Progressive Replacement of Natural Surface with Lower Permeability Surfaces

As summarised in **Appendix D**, the drainage design for the electricity substation site provides for the release of any surface water captured to be recharged back to ground, with a very nominal spatial diversion of the water (tens of metres). In doing so, all rainfall which falls on the site will continue to infiltrate to ground. There will be no net increase in runoff from the electricity substation site.

The operational phase drainage system will be installed and constructed in conjunction with the road and hardstanding construction work as described below:-

- The surface of the vast majority of access tracks (other than a short section within the substation compound) will be permeable and will allow for incident rainfall to percolate to ground, thus avoiding significant run-off generation;
- The use of permeable materials will avoid changes to the natural drainage regime at the electricity substation site;
- Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean local drainage water, in order to minimise the amount of rainfall reaching areas where suspended sediment could become entrained. Collected drainage water will then be directed to areas where it can be slowly re-distributed over the ground surface and infiltrate through the soil and subsoils;
- Swales/road side drains will be used to collect drainage from access tracks, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; and,
- Check dams will be used along sections of access track drains to attenuate flows and intercept silts at source. Check dams will be constructed from a 4/40 mm non-friable crushed rock.

The stormwater management plan was designed so that storm water will be attenuated with discharge being limited to greenfield rates with storm-water storage facilities and SuDS elements incorporated to allow for a reduction of run-off volumes where possible. In particular:-

- The stormwater drainage management plan include the provision of an attenuation system designed to cater for a 1 in 100-year storm event;
- This system will temporarily store stormwater and gradually release it back into the local drainage system at greenfield runoff rates; and,
- The proposed attenuation system reduces the risk of downstream flooding.

5.7.2.2 Contaminated Runoff / Recharge

- A stormwater piped network will be built during the construction phase and will be used in the operational phase to collect all stormwater from the impermeable areas of the electrical substation site. Runoff from the tracks and other hardstand areas will continue to be directed towards the settlement ponds which will be left in place after the construction phase. Check dams will also be left in place in the drainage channels. This infrastructure will ensure that runoff is both attenuated and treated prior to release across the existing vegetation and recharging to ground;
- Onsite re-fuelling of machinery will not be carried out during the operational phase of the development. All plant/machinery will be refuelled offsite;

- Fuels stored on site will be minimised and any diesel or fuel oils / hydrocarbons stored on-site will be bunded within the control building. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;
- The electrical control building will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. A storm drainage system and an appropriate oil interceptor will be installed at the compound of the electricity substation to avoid any discharges from the site of hydrocarbons;
- Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with accidental spillages;
- A hydrocarbon interceptor will be located upstream of the stormwater attenuation system; and,
- Wastewater arising from the control building will be stored in a sealed sub-surface tank and will be removed from the site as required by a local licenced waste collector.

5.7.3 Efficacy of Mitigation Measures

The environmental measures set out above are proven to work and provide certainty that the integrity of Lough Ree SPA, River Suck Callows SPA, River Shannon Callows SAC and Middle Shannon Callows SPA will not be affected by the construction or operation of the project.

These measures will ensure that suspended solids or other pollutants will not be discharged into surface waters during construction and there will be no effect on the water quality downstream of the project site. Similarly, there will be no accidental spread of invasive plant species.

The measures will also ensure that there is no appreciable disturbance or displacement to any wintering QI birds using the turloughs south and southwest of the proposed substation.

5.7.4 Summary of Mitigation Measures

water

management plan

and water quality management plan

Buffer zone

A summary of mitigation measures is provided in Table 5.19.

Preventing Adverse Effects on European Sites					
Effect	Mitigation Measures	Responsibility Implementation	Efficacy of Mitigation	Adverse Effe on Integrity o European Site	
Deterioration of water quality	Site drainage plan, surface	Contractor	Established and proven	No	

Contractor

construction

Established and

No

measures

proven construction measures

Table 5.19: Summary of Mitigation Measures, Responsibilities and Efficacy in Preventing Adverse Effects on European Sites

Effect	Mitigation Measures	Responsibility Implementation	Efficacy of Mitigation	Adverse Effect on Integrity of European Sites
	Source, in-line and treatment controls	Contractor	Established and proven construction measures	No
	Weather constraints	Contractor	Established and proven construction measures	No
	Hydrocarbon, wastewater and cement management	Contractor	Established and proven construction measures	No
Biosecurity	Prevention and containment measures	Contractor, ECoW	Established and proven construction measures	No
Disturbance / displacement of QI winter birds	Limiting majority of construction to breeding season, use of visual / acoustic screening to avoid disturbance and management of vehicle / personnel behaviour	Contractor, ECoW	Established and proven construction measures	No

6.0 Conclusion

This NIS contains information which the competent authority may consider in making its own conclusions and upon which it can determine that all reasonable scientific doubt has been removed as to the effects of the project on the integrity of the relevant European sites. The potential impacts that could arise from the project during the construction and operational phases are set out in this report and a proposed mitigation measures for the construction and operational and operational phases is described with all mitigation measures being implemented in full.

With the identified mitigation measures in place, it can be concluded, beyond all reasonable scientific doubt that the project, either alone or in combination with other plans or projects will not undermine the conservation objectives of any European sites. It can therefore be concluded that the project will not have an adverse effect on the integrity of any European site.

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Appendix A Figures

Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

SLR Project No.: 501.065165.00001

30 August 2024





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Appendix B Baseline Bird Report

Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

SLR Project No.: 501.065165.00001

30 August 2024





尜SLR

Winter Bird Survey Report 2023/2024

Moyvannan Substation and Grid Route

Galetech Energy Services

Clondargan, Stradone, Co. Cavan

Prepared by:

SLR Environmental Consulting (Ireland) Ltd

7 Dundrum Business Park, Windy Arbour, Dublin, D14 N2Y7

SLR Project No.: 501.065165.00001 Client Reference No: N/A

7 June 2024

Revision: 00

This document contains confidential information on the locations of bird nests.

Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
00	17 May 2024	Hugo Brooks	Dr Jonathon Dunn	Dr Jonathon Dunn
	Click to enter a date.			
	Click to enter a date.			
	Click to enter a date.			
	Click to enter a date.			

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1.0 Introduction

SLR Environmental Consulting (Ireland) (SLR) was commissioned by Galetech Energy Services to carry out fortnightly feeding distribution surveys between October 2023 and March 2024 for the proposed Moyvannan substation and grid route ('the Project').

1.1 Background to the Commission

No previous planning permission has been sought on the application site ('the Project Site') for the development of grid routes / substations by Galetech Energy Services or any other party.

1.2 Project Site Description

The Project Site is presented in **Figure 1** in **Appendix A**. The Project is approximately 5 km north-west of Athlone, Co. Westmeath but located in Co. Roscommon. The dominant habitats along the proposed grid route and within the substation site are agricultural grasslands, turloughs, broadleaf woodland, hedgerows, and treelines.

After the completion of surveys, a second grid route which was not surveyed was chosen (option A). Option A and option B (surveyed but not chosen) are presented in **Figure 1** in **Appendix A**.

1.3 Purpose of this Report

This report outlines the surveys undertaken and methods used. It then summarises the survey data obtained and provides descriptions of the legal and conservation status of the species recorded.

The assessment of impacts resulting from the Project and the development of mitigation measures, if required, are beyond the scope of this report.

2.0 Methodology

2.1 Scope of Work

The scope of survey work was based on existing knowledge of the area and proximity to nearby designated nature conservation sites (see section 3.1). Wintering wildfowl and waders were judged to be of key consideration, especially considering the presence of turloughs near the proposed substation area.

Consequently, feeding distribution surveys as described by NatureScot (NS; formerly Scottish Natural Heritage, SNH) guidance¹ were chosen as appropriate, with details of the methodology provided in **Table 2-1**. While this NS guidance is for wind farms, the feeding distribution survey methodology is appropriate for the current Project as it is like the Irish Wetland Bird Survey (I-WeBS) methodology, which is recommended by the Bird Survey Guidelines² where wetland habitats are present that have the potential to support waterbird species.

Details of survey dates and times are provided in **Appendix B** and a record of weather conditions during surveys is provided in **Appendix C**

Survey Type	Summary Methodology (see Section 2.2.2 for further details)
Feeding Distribution Surveys	Twelve feeding distribution surveys were carried out within the period October 2023 to March 2024, twice per month with approximately two weeks between surveys, to search for wildfowl and waders within a 500 m buffer of the Project Site.

Table 2-1: Scope of Ornithological Survey Work

2.2 Field Surveys

2.2.1 Field Survey Personnel

2.2.1.1 Huge Brooks – Graduate Ecologist

Hugo is a Graduate Ecologist with SLR. Hugo has a BSc (Hons) in Zoology from University College Dublin. Hugo's first professional role in ecology was as a temporary consultant ecologist with Scott Cawley Ltd. (March – October 2022), where he gained experience in bat surveys, bat call analysis and breeding bird surveys. He is a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Since joining SLR, Hugo has worked on multiple renewable energy projects. He has carried out various bird surveys including vantage point, breeding wader, breeding raptor, hen harrier *Circus cyaneus*, swan and goose feeding/distribution and intertidal surveys. Hugo has also gained experience in bat transect surveys, bat roost potential surveys and general walkover habitat surveys.

2.2.1.2 Jake Matthews – Project Ecologist

Jake is a Project Ecologist with SLR. Jake holds a BSc (Hons) in Wildlife Conservation and Zoo Biology from University of Salford and an MSc in Ecology & Environment Management

¹ Scottish Natural Heritage (2017). *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms V2.* Scottish Natural Heritage, Inverness.

² <u>https://birdsurveyguidelines.org/wetland-bird-survey-webs/</u> Accessed 12/07/2024

from Liverpool Hope University. Jake has four years' experience in ecological consultancy both within the UK and Ireland. Jake has a diversified skillset within ecology, with an interest in ornithology and has strengths with Preliminary Ecological Appraisals, Appropriate Assessments, Biodiversity Net Gain Assessments, ECoW, as well as a range of speciesspecific surveys.

2.2.1.3 Darragh Nagle – Project Ecologist

Darragh is a Project Ecologist and graduated from University College Cork in 2020 with a BSc degree (Hons) in Ecology and Environmental Ecology. He is a qualifying member with CIEEM. Since joining SLR Darragh's field experience includes multiple diverse bird surveys on windfarm sites across Ireland with experience in vantage point, breeding wader, breeding raptor, feeding distribution, hen harrier roost and intertidal bird surveys.

2.2.1.4 Lorcan Kelly – Graduate Ecologist

Lorcan Kelly holds a BSc. in Science (Zoology) from University College Dublin and an MSc. in Applied Ecology and Conservation from the University of East Anglia. He has recently joined SLR having previously worked for The Ecology Consultancy, Norwich. He is a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Lorcan has experience of bird surveys from working on wind farm projects within Ireland.

2.2.2 Feeding Distribution Surveys

Feeding distribution surveys were carried out on a fortnightly basis between October 2023 and March 2024 to search for wildfowl and waders using fields within at least 500 m of the Project Site. These were undertaken by driven transects, stopping on a regular basis to search for all fields for bird feeding activity. Where visibility of fields within the Project Site could not be obtained via driven transect, they were surveyed on foot. Other species of note were also recorded.

Details of survey dates, times and observers are provided in **Appendix B** and a record of weather conditions during surveys is provided in **Appendix C**. The survey area is shown in **Figure 1** in **Appendix A**.

2.3 Survey Limitations

An alternative grid route was identified as the surveys were coming to an end, therefore, much of this grid route was not surveyed. The location of the substation remains the same, as a result, data collected near the substation and overlapping areas of grid route A and B can be considered representative.

In places, certain areas within 500 m of the grid route (but not the proposed substation location) were not visible and were not accessible, as they were located within private lands.

3.0 Results

3.1 Desk-based Review

There are six SPAs within 20 km³ of the Project Site with details shown in **Table 3-1**.

Table 3-1: SPAs within 20 km of the Project Site and their Qualifying Interests

Site Name	Site Code	Distance / Direction from Project Site	Qualifying Interests Relevant to the Non- Breeding Season
Lough Ree SPA	004064	2.1 km east	Eurasian coot <i>Fulica</i> <i>atra</i>
			Eurasian wigeon <i>Mareca penelope</i>
			Eurasian teal <i>Anas</i> <i>crecca</i>
			European golden plover
			Common goldeneye <i>Bucephala clangula</i>
			Common scoter <i>Melanitta nigra</i>
			Little grebe <i>Tachybaptus</i> <i>ruficollis</i>
			Mallard Anas platyrhynchos
			Northern lapwing
			Vanellus vanellus
			Northern shoveler Anas clypeata
			Tufted duck <i>Aythya</i> <i>fuligul</i> a
			Whooper swan <i>Cygnus cygnus</i>
Lough Croan Turlough SPA	004319	7.7 km west	Greenland white- fronged goose Anser albifrons flavirostris
			Northern shoveler
			European golden plover

³ 20 km represents the largest core foraging distance from any qualifying interest species found in Ireland



Site Name	Site Code	Distance / Direction from Project Site	Qualifying Interests Relevant to the Non- Breeding Season				
Middle Shannon Callows SPA	0040096	9.7 km south-east	Black-headed gull Larus fuscus				
			Black-tailed godwit <i>Limosa limosa</i>				
			Corncrake Crex crex				
			Eurasian wigeon				
			European golden plover				
			Northern lapwing Whooper swan				
Four Roads Turlough SPA	004140	12.1 km east	European golden plover				
			Greenland white- fronted goose				
River Suck Callows SPA	004097	12.7 km east	European golden plover				
			Eurasian wigeon				
			Northern lapwing				
			Whooper swan				
			Greenland white- fronted goose				
Mongan Bog SPA	004017	18.3 km south-east	Greenland white- fronted goose				

3.2 Feeding Distribution Survey

A summary of results of the twice-monthly feeding distribution surveys undertaken throughout the winter season is presented in **Table 3-2**.

This presents the peak count obtained for each species per fortnightly survey.

Survey results are shown in Figures 2 and 3 in Appendix A.

Month	Visit		Peak Count																	
		Black-headed aull	Cormorant	Common gull ⁴	Common kestrel ⁵	Eurasian coot	Eurasian curlew ⁶	Eurasian teal	Eurasian wideon	Great crested arebe ⁷	Grey heron ⁸	Northern Iapwing	Lesser black- backed gull ⁹	Little grebe	Mallard	Moorhen ¹⁰	Mute swan ¹¹	Oystercatcher	Tufted duck	Whooper swan
October	1	-	-	-	-	-	1	-	-	-	1	25	-	-	6	1	-	1	-	-
	2	-	-	-	-	-	-	12	-	1	-	1	-	-	6	1	2	-	-	-
November	1	11	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	95	-	-	-	-	-	-	6	1	-	70	-	-	-	-	3	-	-	3
December	1	20	-	1	-	-	-	3	-	-	-	19	-	-	4	2	2	-	-	-
	2	40	-	-	-	-	-	30	-	-	-	66	-	-	2	-	2	-	-	14
January	1	35	-	-	-	-	-	33	84	-	-	22	-	-	4	-	5	-	-	-
	2	108	-	-	-	-	-	-	-	-	-	56	-	-	-	-	-	-	-	9
February	1	60	-	-	-	2	-	29	68	-	1	120	3	-	6	2	-	-	8	-

Table 3-2: Peak Counts Across Feeding Distribution Surveys

7

⁴ Larus canus

⁵ Falco tinnunculus

⁶ Numenius arquata

7 Podiceps cristatus

⁸ Ardea cinerea

⁹ Larus fuscus

¹⁰ Gallinula chloropus

¹¹ Cygnus olor

¹² Haematopus ostralegus

Month	Visit			Peak Count																
		Black-headed aull	Cormorant	Common gull ⁴	Common kestrel ⁵	Eurasian coot	Eurasian curlew ⁶	Eurasian teal	Eurasian wiœon	Great crested arebe ⁷	Grey heron ⁸	Northern Iapwing	Lesser black- backed gull ⁹	Little grebe	Mallard	Moorhen ¹⁰	Mute swan ¹¹	Oystercatcher	Tufted duck	Whooper swan
	2	65	1	-	-	2	-	22	59	-	-	53	1	2	2	-	2	-	3	-
March	1	90	-	-	-	5	-	15	19	-	-	-	3	1	-	2	2	-	2	-
	2	5	-	-	-	6	-	10	47	-	-	-	-	1	3	1	2	-	-	-

3.2.1 Black-headed Gull

Black-headed gull were commonly recorded both flying and foraging during the feeding distribution surveys. They were most frequently recorded on the turloughs south-west of the proposed substation location. A peak count of 108 was recorded in January 2024. Observations were also made of flocks of black headed gulls foraging in improved agricultural grassland within the 500 m buffer of where grid route A and grid route B overlap.

3.2.2 Cormorant

A single cormorant was recorded in February 2024 within 500 m of the grid route B.

3.2.3 Common gull

Common gulls were recorded during a survey in December 2023 only. Two observations were made of single birds foraging in fields along the overlapping sections of grid route A and B.

3.2.4 Common Kestrel

A single common kestrel was recorded in November 2023. This bird was observed along grid route B within the 500 m buffer.

3.2.5 Eurasian Coot

Eurasian coots were recorded in February and March 2024 only, across many ponds / turloughs within the 500 m buffer of gride route B and the proposed substation location. A peak count of six birds was recorded on the turloughs approximately 450 m south/south-west of the proposed substation location.

A Eurasian coot nest was recorded in March 2024 within the overlapping 500 m buffer area of grid route A and B (see **Figure 4** in **Appendix A**). This nest was in a pond approximately 100 m to the south of the L2018.

3.2.6 Eurasian Curlew

A single curlew was heard within 500 m of the proposed substation location in October 2023.

3.2.7 Eurasian Teal

Eurasian teal were frequently recorded across the survey period and had a peak count of 33 in January 2024. Most observations of Eurasian teal were within the turloughs south-west of the Project site (approximately 450 m from the proposed substation location). Smaller flocks were often observed in a pond within the 500 m buffer along the overlapping sections of grid route A and B.

3.2.8 Eurasian Wigeon

Eurasian wigeon were recorded during the surveys from November 2023 to March 2024. The highest concentration of this species was observed within the turloughs south-west of the proposed substation location, with a peak count of 84. These flocks ranged from 300-600 metres from the proposed substation location. Smaller flocks of Eurasian wigeon were observed within other turloughs within the 500 m buffer along the overlapping sections of grid route A and B.

3.2.9 Great Crested Grebe

Great crested grebes were observed on two occasions, once in October 2023 and once in November 2023; both observations were of a single bird. These observations were on the turloughs south-west of the proposed substation location, approximately 400 m from the proposed substation location.

3.2.10 Grey Heron

Grey herons were recorded in two occasions. A single bird was recorded in October 2023 within the turloughs south/south-west. Another recording of a single grey heron was made in in February 2024. This observation was within 500 m of grid route B.

3.2.11 Northern Lapwing

Observations of northern lapwing were made in the months of October 2023 to February 2024. The highest concentrations of lapwing were observed repeatedly on the turloughs south / south-west of the proposed substation location, with a peak count of 120 birds recorded in February 2024. These recordings ranged from approximately 400 – 700 m from the proposed substation location. Smaller flocks were observed foraging in improved agricultural grasslands along grid route B and in buffer areas where grid route A and B overlap.

3.2.12 Lesser Black-backed Gull

Lesser black-backed gulls were recorded on three occasions within the months of February and March 2024. These observations were concentrated around the turloughs south/south-west of the proposed substation location.

3.2.13 Little Grebe

Little grebe observations were made in February and March 2024, with a peak count of two birds recorded. This species was recorded within the turloughs south / south-west of the proposed substation location, and within a pond within the buffer area where grid route A and B overlap.

3.2.14 Mallard

Mallard observations were most made on the turloughs south of the proposed substation location. Mallards were recorded in all months except November 2023. A peak count of six birds was made in February 2024.

3.2.15 Moorhen

Moorhen were exclusively recorded on the turloughs south / south-west of the proposed substation location. Observations of this species were made in all months except November 2023 and January 2024. These recording were 400 – 700 m from the proposed substation location.

3.2.16 Mute Swan

Mute swans were recorded in every month during the feeding distribution surveys. A peak count of five mute swans were recorded during the first survey in January 2024. All but one observation of mute swan was on / around the turloughs south/south-west of the proposed substation location. Mute swans were recorded both within the developable area, the proposed substation location 500 m buffer, and grid route B 500 m buffer. The most heavily used area by mute swans was approximately 400 m from the proposed substation.



3.2.17 Oystercatcher

One oystercatcher was recorded across all the feeding distribution surveys. This individual was recorded in October 2023, north of the proposed substation location and beyond the 500 m survey buffer.

3.2.18 Tufted Duck

All recordings of tufted duck were within the turloughs south/south-west of the proposed substation location. Most recordings were made approximately 450 m for the proposed substation location. Tufted ducks were recorded in February and March 2024 and a peak count of eight birds was recorded in February.

3.2.19 Whooper Swan

Whooper swan were recorded during three of the twelve feeding distribution surveys. A peak of count of 14 whooper swans was recorded during the second survey of December 2023. Both adult and juvenile whooper swans were observed during the surveys. All whooper swan observations were exclusive to the turloughs south/south-west of the proposed substation location. No whooper swans were recorded within the developable area but were observed within the proposed substation and grid route B 500 m buffer, approximately 450 metres south-west of the proposed substation location.

4.0 Summary and Conclusion

Feeding distributions were carried out fortnightly along the proposed grid route B and substation location during the 2023/24 non-breeding season. The highest concentration of swans, wildfowl and waders were within two turloughs approximately 400 - 500 m south / south-west of the proposed substation location.

Many of the wildfowl and wader species were repeatedly recorded on these turloughs, with Eurasian teal, Eurasian wigeon, and northern lapwing having particularly high concentrations on these turloughs. Great crested grebes, moorhens, tufted ducks and whooper swans were exclusively recorded on these turloughs, but were not always present.

There was no notable change of the water level of the turloughs south / south-west of the proposed substation location across the survey period. The proximity of the turloughs to Lough Ree SPA and the constant high, water levels likely explains the observed diversity and flock size of wildfowl and wader species.

A Eurasian coot nest was recorded within 500 m of both grid route options.

5.0 Legal and Conservation Status of Species Recorded

Table 5-1 summarises the legal and conservation status of the species record during the feeding distribution surveys mentioned above. All Irish bird species are afforded general protection by the Wildlife Acts 1976 (as amended).

Species (BTO code)	Legal and Conservation Status ¹³									
Black-headed gull (BH)	BoCCI4 Amber									
Cormorant (CA)	BoCCI4 Amber									
Common gull (CM)	BoCCI4 Amber									
Common kestrel (K.)	BoCCI4 Red									
Eurasian coot (CO)	BoCCI4 Amber									
Eurasian curlew (CU)	BoCCI4 Red									
Eurasian teal (T.)	BoCCI4 Amber									
Eurasian wigeon (WN)	BoCCI4 Amber									
Great crested grebe (GG)	BoCCI4 Amber									
Grey heron (H.)	BoCCI4 Green									
Northern lapwing (L.)	BoCCI4 Red									
Lesser black-backed gull (LB)	BoCCI4 Amber									
Little grebe (LG)	BoCCI4 Green									
Mallard (MA)	BoCCI4 Amber									
Moorhen (MH)	BoCCI4 Green									
Mute swan (MS)	BoCCI4 Amber									
Whooper swan (WS)	Annex I; BoCCl4 Amber									

 Table 5-1: Legal and Conservation Status of Bird Species

¹³ Key: Annex I = the species is listed under Annex I of the EC Birds Directive; BoCCI4 status (green, amber or red) = current Birds of Conservation Concern in Ireland status category.





Appendix A Figures

Winter Bird Survey Report 2023/2024

Moyvannan Substation and Grid Route

Galetech Energy Services

SLR Project No.: 501.065165.00001

7 June 2024









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Appendix B Survey Dates, Times and Observers

Winter Bird Survey Report 2023/2024

Moyvannan Substation and Grid Route

Galetech Energy Services

SLR Project No.: 501.065165.00001

7 June 2024



Surveyor initials are given in section 2.2.1.

Date	Surveyor	Start Time	End Time	Hours (hh:mm)
19/10/2023	JM	12:30	14:30	02:00
27/10/2023	JM	08:05	11:30	03:25
17/11/2023	НВ	10:10	12:35	02:25
28/11/2023	НВ	10:18	12:55	02:37
04/12/2023	LK	10:32	12:58	02:26
20/12/2023	НВ	10:44	13:05	02:21
10/01/2024	НВ	11:15	13:45	02:30
23/01/2024	DN	12:35	15:00	02:25
01/02/2024	НВ	09:30	11:45	02:15
12/02/2024	НВ	07:53	10:30	02:37
01/03/2024	НВ	08:59	11:22	02:23
11/03/2024	НВ	15:45	18:10	02:25
Total hours		•	•	29:59

Table A-1: Details of Feeding Distribution Surveys



Appendix C Weather Data

Winter Bird Survey Report 2023/2024

Moyvannan Substation and Grid Route

Galetech Energy Services

SLR Project No.: 501.065165.00001

7 June 2024



Weather key:

- Rain: None = 0; Drizzle = 1; Light showers/snow = 2; Heavy showers/snow = 3; Heavy rain/snow = 4.
- Cloud cover: Expressed in oktas (n/8).
- Cloud height: Height of cloud above average height of viewshed. <150 m = 0; 150 500 m = 1; >500 m = 2.
- Visibility: Poor (<1 km); Moderate (1-3 km); Good (> 3 km).
- Lying snow: None = 0; On site = 1; On higher ground = 2.
- Frost: None = 0; Ground = 1; All day = 2.

Table A-2: Weather Data Collected During Feeding Distribution Surveys

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°C)
19/10/2023	12:30	14:30	1	2	E	1	8	1		0	0	16
19/10/2023	12:30	14:30	2	2	Е	0	8	2	2	0	0	16
19/10/2023	12:30	14:30	3	2	Е	0	8	2	2	0	0	16
27/10/2023	08:05	11:30	1	3	SE	0	8	0	0	0	0	7
27/10/2023	08:05	11:30	2	1	S	0	8	0	0	0	0	8
27/10/2023	08:05	11:30	3	2	S	0	7	2	2	0	0	8
17/11/2023	10:10	12:35	1	2	SW	0	2	2	2	0	0	7
17/11/2023	10:10	12:35	2	2	SW	0	8	2	2	0	0	7
17/11/2023	10:10	12:35	3	2	S	0	8	2	2	0	0	8
28/11/2023	10:18	12:55	1	1	W	0	7	2	2	0	0	3

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°C)
28/11/2023	10:18	12:55	2	1	W	0	6	2	2	0	0	5
28/11/2023	10:18	12:55	3	1	W	0	7	2	2	0	0	6
04/12/2023	10:32	12:58	1	3	NW	0	1	2	2	0	1	2
04/12/2023	10:32	12:58	2	3	NW	0	2	2	2	0	1	3
04/12/2023	10:32	12:58	3	3	NW	0	1	2	2	0	1	4
20/12/2023	10:44	13:05	1	5	W	1	8	1	2	0	0	10
20/12/2023	10:44	13:05	2	5	W	1	8	2	2	0	0	10
20/12/2023	10:44	13:05	3	5	W	1	8	2	2	0	0	10
10/01/2024	11:15	13:45	1	2	NE	0	1	2	2	0	2	3
10/01/2024	11:15	13:45	2	2	NE	0	0	2	2	0	2	4
10/01/2024	11:15	13:45	3	2	NE	0	1	2	2	0	2	4
23/01/2024	12:35	15:00	1	6	SW	2	8	2	2	0	0	13
23/01/2024	12:35	15:00	2	6	SW	1	8	2	2	0	0	12
23/01/2024	12:35	15:00	3	6	SW	1	8	2	2	0	0	12
01/02/2024	09:30	11:45	1	2	S	0	7	2	2	0	0	4
01/02/2024	09:30	11:45	2	2	S	0	6	2	2	0	0	6
01/02/2024	09:30	11:45	3	2	S	0	7	2	2	0	0	6
12/02/2024	07:53	10:30	1	2	SW	0	3	2	2	0	1	3
12/02/2024	07:53	10:30	2	3	SW	0	2	2	2	0	1	4

Date	Survey Start	Survey End	Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Snow	Frost	Temp (°C)
12/02/2024	07:53	10:30	3	3	SW	0	6	2	2	0	0	5
01/03/2024	08:59	11:22	1	3	NW	3	8	2	1	1	0	2
01/03/2024	08:59	11:22	2	4	NW	2	8	2	2	1	0	3
01/03/2024	08:59	11:22	3	4	NW	2	8	2	2	1	0	3
11/03/2024	15:45	18:10	1	2	SW	1	8	2	2	0	0	9
11/03/2024	15:45	18:10	2	2	S	2	8	2	2	0	0	9
11/03/2024	15:45	18:10	3	2	S	2	8	2	2	0	0	9



Appendix C Aquatic Survey Report

Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

SLR Project No.: 501.065165.00001

30 August 2024



Aquatic ecological assessment of the Cross River, northwest of Athlone, Co. Roscommon



Prepared by Triturus Environmental Ltd.

for SLR Consulting Ireland Ltd.

March 2024

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1. Introduction

1.1 Background

Triturus Environmental Ltd. were commissioned on behalf of SLR Consulting Ireland Ltd. to prepare a baseline fisheries and aquatic assessment of the Cross River, northwest of Athlone, Co. Roscommon (**Figure 2.1**). The survey was required to inform aquatic ecological constraints in light of a proposed grid cable route (GCR) crossing of the Cross River. The survey area was not situated in a European site. The closest downstream European sites with hydrological connectivity to the study area were the River Shannon Callows SAC (000216) and Middle Shannon Callows SPA (0004096). Both European sites are 10.8km downstream of the study area. The collated ecological data on aquatic species and habitats would inform the EIAR and NIS preparation for the proposed project.

A site visit to the Cross River was undertaken by Triturus Environmental Ltd. on the 7th February 2024. The surveys documented the physical habitat of the Cross River to determine its value as a nursery, spawning and holding area for fish of high conservation value. The survey would supplement preexisting fisheries knowledge of the catchment collected by Inland Fisheries Ireland. The current survey also included environmental DNA (eDNA) collection to detect the presence of fish of high conservation including brook lamprey (*Lampetra planeri*), European eel (*Anguilla anguilla*) and Atlantic salmon (*Salmo salar*). Brown trout (*Salmo trutta*) were not tested for as they are known from the catchment based on historical fisheries surveys (Gordon et al. 2023; Kelly et al. 2017; Kelly et al. 2010). Furthermore the eDNA sampling also tested for white-clawed crayfish (*Austropotamobius pallipes*) given the survey was undertaken outside the recommended period for physical searching for this species. Additionally, the site survey documented the aquatic macrophyte and bryophyte assemblages of the Cross River inclusive of Annex I Habitat associations including floating river vegetation and hydrophillous tall herb. A macro-invertebrate sample was also collected to determine the presence of rare invertebrate species and also to determine biological water quality by Q sampling.



1.2 Fisheries asset of the survey area

The Cross River is a renowned recreational brown trout (*Salmo trutta*) fishery although historical drainage works (as recent as 2001) have impacted the fisheries habitat (O'Reilly, 2009). In addition to brown trout, the river is known to support perch (*Perca fluviatilis*), pike (*Esox lucius*), gudgeon (*Gobio gobio*), roach (*Rutilus rutilus*) and roach x bream hybrids (*R. rutilus x Abramis brama*) (Kelly et al., 2017; 2010). Lamprey (*Lampetra* sp.) and stone loach (*Barbatula barbatula*) are known in the lower reaches of the Cross River, whilst the heavily modified upper reaches support three-spined stickleback (*Gasterosteus aculeatus*) (Triturus 2021-2023 data). Lamprey (Lampetra sp.) are known from the Cross River and its tributary, Barr's Drain, in grid square M94 (Triturus, unpublished data).

1.3 Protected aquatic species

A comprehensive desktop review of available data from the National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), Inland Fisheries Ireland (IFI), Botanical Society of Britain and Ireland (BSBI), Environmental Protection Agency (EPA) and Triturus databases for the 10km grid squares containing and adjoining the study area (i.e. M94) identified a low number of records for rare and or protected aquatic species within the vicinity of the proposed wind farm.

A sparse number of records for Annex II white-clawed crayfish (*Austropotamobius pallipes*) were available for 10km grid square M94, with the species known from the Cross River downstream of the study area but not overlapping the proposed GCR crossing.

A single record for the protected short-leaved water starwort (*Callitriche truncata*) was available for 2020 for Lough Ree but not in the Cross River (10km grid square M94) although the species is often found washed up in small patches along the shoreline with source populations not clearly identifiable (Paul Green, pers. comm.). However, whilst this macrophyte species is listed under the Flora (Protection) Order 2022 (S.I. No. 235/2022) and considered 'vulnerable' in Ireland (Wyse-Jackson et al., 2016), there was no hydrological connectivity with the proposed project and its known locations.

1.4 EPA biological water quality data

There were two contemporary EPA biological monitoring stations on the Cross River downstream of the study area. Water quality was recorded as of good status (**Q4**) at a bridge site near Burnbrook (station RS26C100200) in 2023. Further downstream at a bridge upstream of the River Shannon confluence (station RS26C100400) the Cross River was of poor status (**Q3**).

The Cross River, comprises of the Cross_010, Cross_020, Cross_030 and Cross_040 river waterbodies, was of moderate status in the 2016-2021 period and was thus 'at risk' of not achieving good status. Agriculture, peat escapement and historical drainage are the main water quality pressures along the Cross River (EPA, 2019).



2. Methodology

2.1 Fisheries Assessment

A broad appraisal of the riverine habitat of the Cross River at the proposed GCR crossing (ITM 596174, 744372) was undertaken on the 18th December 2022 to evaluate the general fisheries habitat. The fisheries assessment was carried out by characterising the survey area (channel profile, flow profile, substrata & riparian habitat) relative to the known core determinants of good supporting fisheries habitat and or associated pressures (IFI, 2020; O' Grady, 2006; EA, 2003; Hendry & Cragg-Hine, 1997). This supported a broad overview of the general fisheries importance of the area by carrying out an assessment of the distribution and condition of the supporting habitats (i.e. nursery, spawning and holding) to inform the overall importance of the study area for fish. This was considered relative to the known habitat requirements of fish of high conservation value including salmonids, lamprey and European eel.

2.2 eDNA analysis

In order to support the physical fisheries habitat assessment, two no. composite water samples were collected from the Cross River on the 7th February 2024. The samples were analysed for Atlantic salmon, lamprey and European eel eDNA.

In accordance with best practice, a composite (500ml) water sample was collected from the sampling point, maximising the geographic spread at the site (20 x 25ml samples at each site), thus increasing the chance of detecting the target species' DNA. The composite sample was filtered on-site using a sterile proprietary eDNA sampling kit. The fixed sample was stored at room temperature and sent to the laboratory for analysis within 48 hours of collection. A total of n=12 qPCR replicates were analysed for each sample. Given the high sensitivity of eDNA analysis, a single positive qPCR replicate is considered as proof of the species' presence (termed qPCR No Threshold, or qPCR NT). Whilst an eDNA approach is not currently quantitative, the detection of the target species' DNA indicates the presence of the species at and or upstream of the sampling point. Please refer to Appendix A for full eDNA laboratory analysis methodology.

2.3 Q Sampling

A single macro-invertebrate sample was collected downstream of the bridge crossing and converted into a Q-rating as per Toner et al. (2005). The sample were taken with a standard kick sampling hand net (250mm width with, 500µm mesh size) from riffle/glide habitat utilising a three-minute sample effort. This included the washing of large cobble and or small boulder at each survey site, where present. All samples were elutriated and fixed in 70% ethanol for subsequent laboratory identification. Any rare invertebrate species were identified from the NPWS Red List publications for beetles (Foster et al., 2009), stoneflies (Feeley et al., 2020a), mayflies (Kelly-Quinn & Regan, 2012) and other relevant taxa (i.e. O'Connor, 2020; Byrne et al., 2009; Nelson et al., 2011).

An Ecological Quality Ratio (EQR) was also calculated for the riverine sample. This allows for the conversion of a Q rating class to a numerical value to correspond with targets as specified within the European Communities Environmental Objectives (Surface Water) Regulations (S.I. No. 272 of 2009)



as amended by the S.I. No. 77/2019. An EQR Ratio is expressed by a numerical value between 0 and 1 in the case of Q sampling by dividing the recorded Q rating by the maximum reference value (i.e. Q5 or 1.0 when converted to a numerical value). In the case of the Surface Water Regulations 2019, minimum targets for rivers are specified as 0.75 for Good Status (equivalent Q4) and 0.85 for High status (equivalent Q 4-5) (**Table 2.1**).

As such, the severity of anthropogenic pollution can be determined based on deviation from target reference conditions (Feeley et al. 2020b). In this respect, 'High status' is defined as the biological, chemical and morphological conditions associated with no or very low human pressure, while at the other extreme 'Bad Status' would be representative of severe anthropogenic pressures on a river.

Q Value	EQR	WFD Status	Pollution Status	Condition
Q5 or Q4-5	≥0.9	High Status	Unpolluted	Satisfactory
Q4	0.8	Good Status	Unpolluted	Satisfactory
Q3-4	0.7	Moderate Status	Slightly polluted	Unsatisfactory
Q2-3 or Q3	0.5-0.6	Poor	Moderately polluted	Unsatisfactory
Q1, Q1-2 or Q2	0.2-0.4	Bad	Seriously polluted	Unsatisfactory

Table 2.1 Reference Categories for EPA Q-Ratings (Q1 to Q5)





Figure 2.1 Location of the survey areas on the Cross River, northwest of Athlone, Co. Roscommon

3. Results

3.1 Aquatic Habitat Description

The Cross River was representative of very swift flowing lowland depositing watercourse (FW2). The watercourse was 5-6m wide and between 0.3-0.6m deep (**Plates 3.1-3.2**). The river had 1.5-2m high banks and was historically realigned and deepened with boulder bank reinforcements adjoining the bridge crossing. Despite historical alterations the Cross River exhibited good recovery and retained a semi-natural flow profile dominated by swift flowing riffle and glide with localised pool. The bed comprised of compacted small boulder and cobble with pockets of mixed coarse, medium and fine gravels with localised sand. Silt pockets were also present locally in pool slacks. The bed had moderate siltation despite high energy (silt plumes underfoot)with superficial silt deposition in the channel margins. Given the higher energy of the channel it only supported submerged water parsnip (*Berula erecta*) with localised water mint (*Mentha aquatica*) in the margins. The instream boulders supported the moss *Rhychostegium riparioides* and *Cinclodotus fontnaloides*. The macrophyte and bryophyte community was thus not representative of the Annex I habitat, Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260].

The riparian areas supported occasional reed canary grass (*Phalaris arundinacea*), grey willow (*Salix cinerea* sp. *oleifolia*) and gorse (*Ulex europaeus*). The channel was bordered by improved pasture (GA1) for sheep grazing that was the dominant bordering land use. While the channel had some value for white-clawed crayfish (*Austropotambius pallipes*) none were recorded present and no crayfish remains were observed in otter spraint recorded in the vicinity of the bridge crossing. The eDNA sample also returned a negative result for crayfish (*section 3.3*) supporting the absence of the species in the survey area despite known historical records downstream (refer to desktop review).

The Cross River in the vicinity of the GCR crossing was a good quality salmonid nursery with mixed cohorts brown trout observed during the survey supporting the known value of the river as a brown trout fishery. The mixed coarse substrata and swift flows provided ample refugia for salmonids. However, the moderate sedimentation and compaction of the bed reduced spawning quality to moderate despite locally good patches of spawning habitat being present both upstream and downstream of the bridge. Holding habitat was good locally in deeper glide and in pool. The channel had some moderate quality eel habitat that was reduced because of the compaction of coarse bed substrata. The eDNA sampling did not detect eel supporting the species absence from the river. The channel had localised lamprey ammocoetes burial habitat despite high energy restricted to superficial silts. Improved burial habitat may exist further upstream and or downstream of the study area given that lamprey distribution is often patchy in rivers that have had historical drainage alterations. The channel however supported good spawning for brook lamprey and the eDNA showed a strong positive trace of brook lamprey (**section 3.4**).





Plate 3.1 Cross River upstream of the bridge crossing



Plate 3.2 Cross River downstream of the bridge crossing



3.2 Otter Survey

Otter spraint was recorded c. 10m downstream of the bridge on marginal boulders (ITM 596174, 744360) and on the concrete ledge under the bridge structure (ITM 596171, 744367). The otter spraint had both roach and salmonid remains but not white-clawed crayfish. No other otter signs were recorded within 150m of the proposed GCR crossing inclusive of breeding and or resting areas. While there was some suitability for an otter couch area under the dry western arch (given secluded void space) no otter signs were recorded.



Plate 3.3 Otter spraint with salmonid and roach remains

3.3 Biological Water Quality (Q Sampling)

A Q-samples was collected at a single location downstream of the road bridge crossing on the Cross River on the 7th February 2024. The species composition was converted into Environmental Protection Agency (EPA) Q rating by grouping the species assemblage into water quality classes based on their known pollution sensitivities. Following the methodology of Toner et al. (2005), the Environmental Protection Agency (EPA) group invertebrates into classes whereby pollution intolerant species are denoted class A, and species with greater pollution tolerance fall into successive classes (B through E, respectively). As such, the presence or absence of these groups and their relative abundance facilitates an assessment of biological river health. Good status (Q4) unpolluted water quality is achieved according to the EPA if at least one Group A taxon is present in, at least, fair numbers (5-10% total sample composition). Group B taxa may be common or absent and *Baetis rhodani* (large dark olive mayfly) is often dominant (Toner et al. 2005). Other Group C taxa are never excessive and group D / E taxa are present in small numbers or absent (Toner et al., 2005). Our results are discussed in this context to interpret potential changes in the macroinvertebrate community composition. Furthermore, the Q sample results were converted into an Ecological Quality Ratio to reference with



the standards specified in the European Communities Environmental Objectives (Surface Water) (Amendment) Regulations S.I. No. 77/2019.

The invertebrate sample from the Cross River had fair numbers of EPA group A mayfly species including both *Ephemera danica* and *Heptagenia sulphurea* (i.e. very clean water indicator species). The Cross River also supported the clean water indicator cased caddis species *Silo pallipes* and *Agapetus fuscipes*, both being clean water EPA group B species. The sample also had numerous EPA group C (moderate water quality indicator species) including the caseless caddis *Hydropsyche instabilis* and the riffle beetle species *Elmis aenea* and *Limnius volkmari*. The invertebrate sample at the Cross River had a representative Q-rating of **Q4 (good status**) based on the sample composition recorded (i.e. good numbers of clean water Group A and B species). Rivers with Q4 ratings have an equivalent EQR of **0.8** and therefore meets the target EQR of ≥ 0.75 good status target of the Water Framework Directive (2000/60/EEC) as prescribed by the European Communities Environmental Objectives (Surface Water) (Amendment) Regulations S.I. No. 77/2019. No rare invertebrate species were recorded according to the NPWS Red List publications for beetles (Foster et al., 2009), stoneflies (Feeley et al., 2020a), mayflies (Kelly-Quinn & Regan, 2012) and other relevant taxa (i.e. O'Connor, 2020; Byrne et al., 2009; Nelson et al., 2011) (**Table 3.1**).

Taxon	Family	Binomial name	Abundance	EPA Groups
Ephemeroptera	Ephemeridae	Ephemera danica	2	Α
Ephemeroptera	Heptageniidae	Heptagenia sulphurea	5	А
Trichoptera	Goeridae	Silo pallipes	1	В
Trichoptera	Glossosomatidae	Agapetus fuscipes	2	В
Ephemeroptera	Baetidae	Baetis rhodani	9	С
Trichoptera	Hydropsychidae	Hydropsyche instabilis	3	С
Crustacea	Gammaridae	Gammarus duebeni	22	С
Coleoptera	Elmidae	Elmis aenea	6	С
Coleoptera	Elmidae	Limnius volckmari	1	С
Coleoptera	Gyrinidae	Gyrinidae larva	1	С
Diptera	Simuliidae	sp. indet.	5	с
	Abundance		57	
	Taxon Richne	SS	11	
	Q4			
	0.7			
	Good			

Table 3	3.1 Macro-invertebrate	snecies com	nosition fo	r the Cross F	River northwest	of Athlone
Table .			iposition io			OF ACTIONC



3.4 eDNA Analysis

Very strong eDNA signatures were present for brook lamprey in the Cross River (12 out of 12 qPCR replicates, for both) (**Table 3.2; Appendix A**). This is considered as evidence of the presence of the species in the vicinity of the study area. No salmon, eel or white-clawed crayfish eDNA was detected for brook lamprey at either the upstream or downstream sites (i.e. 0 out of 12 qPCR replicates for each sample). This is considered as evidence of these species absence from the study area (**Table 3.2**).

Laboratory Sample ID	Target Species	Sample Integrity Check	Number Positive qPCR Replicates
11689	White-clawed crayfish (Austropotamobius pallipes)	Pass	Negative (0/12)
	European eel (Anguilla anguilla)	Pass	Negative (0/12)
	Atlantic salmon (<i>Salmo salar</i>)	Pass	Negative (0/12)
	Brook Lamprey (<i>Lampetra planeri</i>)	Pass	Positive (12/12)

 Table 3.2 eDNA results from samples collected from the Cross River, northwest Athlone, Co.

 Roscommon (positive qPCR replicates out of 12 in parentheses)

4. Discussion

The Cross River at the study area was a semi-natural lowland depositing watercourse (FW2) that had evident historical drainage modifications. Nonetheless, the Cross River remained of high value for fish of high conservation value. Brook lamprey (*Lampetra planeri*) were detected via eDNA sampling and with good spawning and moderate quality nursery habitat for the species present in the vicinity of the proposed GCR crossing. While nursery habitat was 'patchy' (limited to more localised superficial sand and silt) spawning habitat was more extensive given mixed medium and fine gravels between coarser bed substrata. However, in pools and depositional areas >100m downstream of the crossing more significant lamprey habitat exists (pers. obs.)

Good quality spawning and nursery habitat for brown trout was also present both upstream and downstream of the proposed GCR crossing, with valuable holding areas for migratory adults present downstream (in deeper glide and pool habitat). No Atlantic salmon were recorded in eDNA and while salmon can and enter parts of the middle Shannon including the River Suck the species densities are either very low or the species does not occur in the Cross River. The species has not been recorded by Inland Fisheries Ireland from the river in historical surveys (Gordon et al. 2023; Kelly et al. 2017, Kelly et al. 2010).

The survey area (especially deep glide) downstream of the proposed GCR was of moderate suitability for Red-listed (King et al., 2011) and critically endangered (Pike et al., 2020) European eel, but the species was not recorded in eDNA sampling. Downstream barriers including Meelick Weir and Ardnacrusha Dam restrict the passage of eel into the middle River Shannon catchment and likely explains the very low density or absence of eels in the study area.

Although some good habitat suitability was present in terms of instream refugia for white-clawed crayfish (i.e. boulders and cobble), none were recorded during the survey in eDNA sampling. Furthermore, no crayfish remains were detected in otter spraint. However, historical crayfish records exist for the Cross River downstream of the study area and thus populations may exist further downstream (NBDC & NWPS data). Additionally, no other rare or protected macro-invertebrate species (according to national red lists) were recorded in the samples taken from the Cross River at the study area. In terms of biological water quality, the Cross River achieved **Q4** (good status) due to the presence of fair numbers of pollution sensitive (EPA group A) mayflies and also cased caddis (EPA group B). Thus, the Cross River in the study area was meeting the target good status (\geq Q4) requirements of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC).

Two otter spraint sites were recorded under the bridge crossing and on marginal boulders downstream of the bridge crossing on the Cross River. The survey area was considered to provide good foraging and commuting habitat although no breeding and or resting areas were recorded within 150m of the proposed GCR crossing, likely due to more limited riparian cover (much of the banks downstream of the crossing were sparse and open. A search of the riparian boulder revetments and dry arch of the bridge adjoining the GCR crossing did not identify any potential holt sites. Furthermore, the very hard ground of the modified banks, compacted during historical drainage works also offered limited the potential for holt excavation on the riverbanks.



The macrophyte and bryophyte community was thus not representative of the Annex I habitat, Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260].

Overall, the high value fisheries habitat (including brown trout and lamprey) in the context of the Shannon catchment and the presence of important water dependant species such as otter inclusive of historical crayfish records indicates the Cross River is of County Importance.



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6. Appendix A – Copy of eDNA laboratory report



eDNA Analysis

Summary

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

Results

Lab ID	Site Name	OS Reference	Target Specles	Sample Integrity Check	Result	Positive Replicates
11689	Cross River		Atlantic salmon	Pass	Negative	0
			Brook lamprey	Pass	Positive	12
			European eel	Pass	Negative	0
			White-clawed crayfish	Pass	Negative	0

Matters affecting result: none

Reported by:pos

Approved by: Chelsea Warner



Folio No: Purchase Order: Contact: Issue Date:

75-2024 FEB24 CROSS Triturus Environmental Ltd 27.02.2024



Methodology

Samples have been analyzed for the presence of target species eDNA following readily available and scientifically published eDNA assays and protocols.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real-time PCR (also called q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops, gPCR combines amplification and detection of target DNA into a single step. With gPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis. The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species. Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified. If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If target DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent the risk of false positive and false negative results. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared. Stages of the analysis are also conducted in different buildings at our premises for added security. SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check: Laboratory Arrival:

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation and Inhibition check:

Analysis of the spiked DNA marker to see if there has been degradation or inhibition of the kit or sample, between the date it was made to the date of analysis. Degradation of the spiked DNA marker may indicate a risk of false negative results. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result:

Presence of eDNA (Positive/Negative/Inconclusive)

Positive: DNA was identified within the sample, indicative of species presence within the sampling location at the time the sample was taken or within the recent past.

Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for species presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. Even a score as low as 1/12 is declared positive. 0/12 indicates negative species presence.

Negative: eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for species presence or absence.





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Appendix D Abridged Water Chapter

Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

SLR Project No.: 501.065165.00001

30 August 2024





Moyvannan Electricity Substation

Environmental Impact Assessment Report

Chapter 7: Water (Abridged)

Energia Renewables ROI Limited

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7.2 Methodology

7.2.1 Desk Study

A desk study of the project site and the study area (see **Section 7.2.7**) was completed in Autumn 2023 to collect all relevant hydrological, hydrogeological and meteorological data. The desk study was completed in advance of, and to supplement, site walkover surveys, drainage mapping and site investigations. The desk study information has been reviewed, and updated where necessary, in August and September 2024.

The desk study involved consultation with and a review of the following sources:-

- Environmental Protection Agency database (<u>www.epa.ie</u>);
- Environmental Protection Agency's Hydrotool Database (<u>www.catchments.ie</u>);
- Geological Survey of Ireland Groundwater Database (<u>www.gsi.ie</u>);
- Met Eireann Meteorological Databases (<u>www.met.ie</u>);
- National Parks & Wildlife Services Public Map Viewer (<u>www.npws.ie</u>);
- Water Framework Directive/EPA Catchments Map Viewer (www.catchments.ie);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 12 (Geology of Longford-Roscommon);
- Geological Survey of Ireland (2004); Groundwater Body Initial Characterization Reports (<u>www.gsi.ie</u>);
- OPW Flood Databases (<u>www.floodinfo.ie</u>); and,
- Aerial Photography, 1:5000 and 6" base mapping (<u>www.geohive.ie</u>).

7.2.2 Baseline Monitoring and Site Investigations

Site walkover surveys, including drainage mapping and hydrological monitoring, were undertaken by Michael Gill, Conor McGettigan and Jenny Law of HES (refer to **Section** Error! Reference source not found. for qualifications and experience). These surveys were completed during both wet and dry-weather periods.

In summary, the site investigations and baseline monitoring completed to inform the preparation of this chapter are as follows:

- Walkover surveys and hydrological mapping of the project site and the surrounding area were undertaken by HES whereby water flow directions and drainage patterns were recorded. These walkover surveys were completed on 22 February 2023, 18 January 2024 and 28 August 2024;
- A total of 2 no. surface water samples were undertaken to determine the baseline water quality of the primary surface waters in the vicinity of the project site;
- A total of 1 no. groundwater sample was obtained to determine the baseline groundwater quality in the areas of the project site;
- Apex Geophysics Ltd completed geophysical investigations at the electricity substation site in April 2023. The aim of these geophysical surveys was to provide information on the presence of any potential karst features, the thickness and type of soils and the depth to bedrock. The geophysical investigation report is provided at **Annex 6.1**;
- Ground Investigation Ireland (GII) completed intrusive site investigation at the electricity substation site between August and October 2023. The site



investigation report is included at **Annex 6.2**. The site investigations comprised of:-

- Excavation of 5 no. trial pits;
- Drilling of 5 no. cable percussion boreholes with follow on rotary core borehole drilling (6 no.);
- Completion of 1 no. soakaway test to determine the soil infiltration rate in accordance with BRE Digest 365;
- The installation of 1 no. groundwater monitoring well at the electricity substation site; and,
- Seasonal groundwater level monitoring completed at the substation site in 2 no. wells (Well 1 and Well 2) between October 2023 and August 2024.

7.2.3 Receptor Sensitivity/Importance/Impact Criteria

Using the National Roads Authority (NRA 2008) guidance, an estimation of the importance of the water environment within and downstream of the project site are quantified by applying the importance criteria set out at **Table 7.1** and **Table 7.2**; the impact magnitude is assessed using **Table 7.3** and **Table 7.4** and the impact rating using **Table 7.5**.

Importance	Criteria	Typical Example
Extremely High	 Attribute has a high quality or value on an international scale. 	 River, wetland or surface water body ecosystem protected by EU legislation, e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid Waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	• Attribute has a high quality or value on a regional or national scale.	 River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	 Attribute quality or value on a local scale. 	 Salmon fishery Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
Medium	 Attribute has a medium quality or value on a local scale. 	 Coarse fishery. Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.



Low	 Attribute has a low quality or value on a local scale. 	 Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes.
		 Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

Table 7.1: Estimation of Importance of Hydrology Criteria (NRA, 2008)

Importance	Criteria	Typical Example		
Extremely High	 Attribute has a high quality or value on an international scale. 	 Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status. 		
Very High	 Attribute has a high quality or value on a regional or national scale. 	 Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source. 		
High	• Attribute quality or value on a local scale.	 Regionally Important Aquifer Groundwater Provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally. important water source. Inner source protection area for locally important water source. 		
Medium	Attribute has a medium quality or value on a local scale.	 Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source. 		
Low	• Attribute has a low quality or value on a local scale.	 Poor Bedrock Aquifer Potable water source supplying <50 homes. 		

Table 7.2: Estimation of Importance of Hydrogeology Criteria (NRA, 2008)

Magnitude	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	 Loss or extensive change to a waterbody or water dependent. Habitat Increase in predicted peak flood level >100mm. Extensive loss of fishery Calculated risk of serious
		 Extensive reduction in amenity value



Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	 Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	 Increase in predicted peak flood level >10mm. Minor loss of fishery. Calculated risk of serious pollution incident >0.5% annually. Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	 Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.

Table	7.3:	Maanitude	of	Hvdroloav	Impact	(NRA.	2008)
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Magnitude	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	 Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	 Removal of moderate proportion of aquifer Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	 Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	 Calculated risk of serious pollution incident <0.5% annually.

Table 7.4: Magnitude of Hydrogeology Impact (NRA, 2008)

	Magnitude of Impact			
Importance of Attribute	Negligible	Small Adverse	Moderate Adverse	Large Adverse



Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Table 7.5: Estimation of Impact Rating (NRA, 2008)

7.2.4 Overview of Impact Assessment Methodology

The conventional source-pathway-target model (see below, top) was applied to assess potential impacts on downstream environmental receptors (see below, bottom as an example) as a result of the project.



Where potential impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the Environmental Protection Agency (EPA) Environmental Protection Agency (May 2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

The description process clearly and consistently identifies the key aspects of any potential impact source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature.

The assessment of effects is Step No. 6, of 7 no., in the EIAR process. In order to provide an understanding of the stepwise impact assessment process applied below, a summary guide is presented below, which defines the steps (Steps 6a to 6g) taken in each element of the assessment process. The guide also provides definitions and descriptions of the assessment process and shows how the source-pathway-target model and the EPA impact descriptors are combined.

Using this defined approach, this impact assessment process is then applied to all construction, operation and decommissioning activities which have the potential to generate a source of significant adverse impact on the geological and hydrological/hydrogeological (including water quality) environments.



6 1			
Step 6a	Identification and Description of Potential Impact Source This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.		
Step 6b	Pathway / Mechanism	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of this type of development, surface water and groundwater flows are the primary pathways, or for example, excavation or soil erosion are physical mechanisms by which a potential impact is generated.	
Step 6c	Receptor	A receptor is a part of the natural environment which could potentially be impacted upon, e.g. human health, plant / animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only arise as a result of a source and pathway being present.	
Step 6d	Pre-Mitigation Effect	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.	
Step 6e	Proposed Mitigation Measures	Control measures that will be put in place to prevent or reduce all identified significant adverse impacts. In relation to this type of development, these measures are generally provided in two types: (1) mitigation by avoidance, and (2) mitigation by engineering design.	
Step 6f	Residual Effect	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impacts after mitigation is put in place.	
Step 6g	Significance of Effects	Describes the likely significant post mitigation effects of the identified potential impact source on the receiving environment.	

Table 7.6: Impact Assessment Process Steps

7.2.5 Consultation

The scope of this assessment has also been informed by consultation with statutory consultees and other bodies with environmental responsibility.

This consultation process is outlined at **Chapter 1** of this EIAR. Issues, concerns and recommendations highlighted by the responses in relation to the water environment are summarised at **Table 7.7** below. The full responses from each of the below consultees are provided at **Annex 1.5**.

Consultee	Summary of Consultee Response	Issue(s) Addressed in Section(s)
Geological Survey of Ireland	 Please use the karst specific layers in the GSI database; Identification of areas of High to Extreme groundwater vulnerability; and, Use of Groundwater Flood Maps in the Flood Risk Assessment. 	Sections Error! Reference source not found., Error! Reference source not found. and Error! Reference source not found.
National Federation of Group Water Schemes	• No GWSs in the local area.	Sections Error! Reference source not found.
OPW	 Where the grid connection crosses a river, the invert pipe crossing should be buried at least 1m 	Crossing will be completed by


	 below the existing bed level, the pipe should be embedded in concrete and suitably protected; and Use of information on <u>www.floodinfo.ie</u> to inform the flood risk assessment. 	directional drilling Summary of FRA presented in Section Error! Reference source not found
Uisce Éireann	 Uisce Éireann provided a standard response in relation to potential effects on Uisce Éireann infrastructure and water supplies; and, Uisce Éireann responded to a Pre-Connection Enquiry and confirmed that there is sufficient capacity for the proposed development and that an existing watermain fronts the proposed development site boundary. 	Sections Error! Reference source not found.

Table 7.7: Summary of Scoping Responses

7.2.6 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation this chapter.

7.2.7 Study Area

The study area for this assessment is defined by the regional surface water catchments and groundwater bodies within which the project is located.

A regional hydrology map showing WFD surface water catchments and subcatchments is provided at **Figure 7.1** (**Annex 7.1**). The relevant surface water catchments within which the project is located are detailed at **Section** Error! Reference source not found.. In addition, the bedrock aquifers and groundwater bodies which underlie the project are detailed at **Section** Error! Reference source not found..

7.3 Description of the Existing Environment

7.3.13 Designated Sites & Habitats

Within the Republic of Ireland, designated sites include Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs), candidate Special Areas of Conservation (cSAC), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).

The project site is not mapped within any designated conservation site.

The nearest designated sites to the electricity substation site include the Lough Ree SAC/pNHA (Site Code: 000440) and the Lough Ree SPA (Site Code: 004064). Lough Ree is the third largest lake in Ireland and is situated in an ice-deepened depression in carboniferous limestone on the River Shannon system between Lanesborough and Athlone. The site is designated for the following qualifying interests:

Lough Ree SAC:-

- Natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetation [3150];
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210];
- Active raised bogs [7110];
- Degraded raised bogs still capable of natural regeneration [7120];
- Alkaline fens [7230];



- Limestone pavements [8240];
- Bog woodland [91D0];
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]; and,
- Lutra lutra (Otter) [1355].

Lough Ree SPA:-

- Little Grebe (Tachybaptus ruficollis) [A004];
- Whooper Swan (Cygnus cygnus) [A038];
- Wigeon (Anas penelope) [A050];
- Teal (Anas crecca) [A052];
- Mallard (Anas platyrhynchos) [A053];
- Shoveler (Anas clypeata) [A056];
- Tufted Duck (Aythya fuligula) [A061];
- Common Scoter (Melanitta nigra) [A065];
- Goldeneye (Bucephala clangula) [A067];
- Coot (Fulica atra) [A125];
- Golden Plover (Pluvialis apricaria) [A140];
- Lapwing (Vanellus vanellus) [A142];
- Common Tern (Sterna hirundo) [A193]; and,
- Wetland and Waterbirds [A999].

These designated sites are located c. 2km east of the electricity substation. However, as stated previously, there is a distinct lack of surface water features in the area of the electricity substation site, therefore there is no direct connection between the electricity substation site and Lough Ree. The only potential connection is via groundwater flowpaths in the underlying limestone bedrock aquifer, with the GSI stating that the overall direction of groundwater flow in the Funshinagh GWB is towards Lough Ree.

Lough Funshinagh SAC/pNHA (Site Code: 000611) is located c. 2km to the northwest of the electricity substation site. The lake, which is underlain by carboniferous limestone, is classified as a turlough because it fluctuates to a significant extent every year and occasionally dries out entirely (approximately two to three times every ten years). In most years, however, an extensive area of water persists. This is filled with vegetation, providing excellent breeding habitat for wildfowl, and the site is designated a Wildfowl Sanctuary. The lake is fed by springs and a small catchment to the west. It is mesotrophic in quality, with some marl (calcium carbonate) deposition, and is surrounded by pastures. The qualifying interests of the Lough Funshinagh SAC are:-

- Turloughs [3180]; and,
- Chenopodion rubric p.p and Bidention p.p vegetation [3270].

Traced underground connections show that groundwater flows southwards from Lough Funshinagh the Cross (Roscommon) River. Therefore, the project site is located downgradient of this SAC/pNHA.

The nearest designated site to the underground electricity line is the Ballynamona Bog and Corkip Lough SAC (Site Code: 002339). The site comprises a relatively small portion of what was once a large bog complex, and includes areas of high bog and cutover bog, and also the turlough, Corkip Lough. The site is mapped at an elevation of c. 55-58 m OD. The qualifying interests of the SAC are:-

• Turloughs [3180];



- Raised Bog (Active) [7110];
- Degraded raised bogs still capable of natural regeneration [7150];
- Depressions on peat substrates of the Rhynchosporion [7150]; and,
- Bog Woodland [91D0].

The Active Raised Bog is hydraulically isolated from the turlough due to the extent of the drainage works around its perimeter. The site is not listed as a groundwater dependent ecosystem, however the formation of the turloughs is due to the annual rise in local groundwater levels. This SAC is located c. 900m south of the southern end of the underground electricity line at Brideswell. There is no direct hydrological connection between the project site and this SAC. Furthermore, the EPA mapping database illustrates a small 1st order stream flowing to the northeast from the SAC and any groundwater flow from the areas of the underground electricity line is likely to emerge as baseflow in this surface water feature. However the possibility of groundwater reaching the SAC cannot be discounted.

Castlesampson Esker SAC/pNHA is located c. 3.8km south of the underground electricity line. There is no direct hydrological connection between this SAC/pNHA and the project site. However the possibility of groundwater reaching the SAC cannot be discounted. The SAC consists of eskers, deposited during the last Glacial Maximum, as well as raised bog and a turlough (Corraree). The site is designated as a SAC based on the following qualifying interests:-

- Turloughs [3180]; and,
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210].

Meanwhile, the underground electricity line has hydrological connections with the River Shannon Callows SAC/pNHA (Site Code: 000216) and the Middle Shannon Callows SPA (Site Code: 004096) via the Cross (Roscommon) River. The River Shannon Callows SAC/ pNHA and the Middle Shannon Callows SPA are situated c. 14.2km downstream (hydrological flowpath length) of the watercourse crossing along the underground electricity line. However, a quantitative analysis, based on flow volumes in the Cross (Roscommon) River (EPA Hydrotool Nodes – www.catchments.ie) has shown that there is no potential for effects downstream of EPA Node 26_4018, located c. 2.34km upstream of the SAC designation. This SAC is designated for the following qualifying interests:-

- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410];
- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510]
- Alkaline fens [7230];
- Limestone pavements [8240];
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]; and,
- Lutra lutra (Otter) [1355].

The Middle Shannon Callows SPA is designated for the following qualifying interests:-

- Whooper Swan (Cygnus cygnus) [A038];
- Wigeon (Anas penelope) [A050];
- Corncrake (Crex crex) [A122];
- Golden Plover (Pluvialis apricaria) [A140];
- Lapwing (Vanellus vanellus) [A142];
- Black-tailed Godwit (Limosa limosa) [A156];



- Black-headed Gull (Chroicocephalus ridibundus) [A179]; and,
- Wetland and Waterbirds [A999].

Lough Slawn pNHA is located on the eastern side of Lough Ree and c. 10.5km northeast of the electrical substation site. This pNHA is located on the opposite lake shore (eastern shore) of Lough Ree in comparison to the project.

Local designated sites in the area and downstream of the project site are shown at **Figure 7.7** (Annex 7.1).

7.3.15 Receptor Sensitivity and Importance

Due to the nature of electricity substation developments and associated underground electricity lines being near surface construction activities, impacts on groundwater are generally negligible and surface water is typically the main sensitive receptor assessed during impact assessments.

However, given the local hydrogeological regime, which is characterised by high rates of groundwater recharge, the proximity of the electricity substation to local groundwater fed turloughs and the mapping of the bedrock aquifer as a Regionally Important Karstified Aquifer, the hydrogeology of the site has been characterised by site investigation data and groundwater will be the main sensitive receptor. The primary risk to groundwater at the electricity substation site would be from cementitious materials, hydrocarbon spillage and leakages and the potential for foundations and hardstand areas to intercept and interfere with groundwater recharge and flows which are considered to be potentially linked to the nearby turloughs.

Based on criteria set out at **Table 7.2**, groundwater at the site can be classed as being Important as the aquifer is mapped as a Regionally Important Karstified aquifer and groundwater vulnerability is mapped as Extreme. This classification is based on generic, assumed conditions inferred from regional mapping of the bedrock geology and aquifer type, without any site-specific data. The site-specific data for the areas of infrastructure indicate the groundwater aquifer is not regionally karstified and that groundwater vulnerability is generally more towards Moderate to High. Notwithstanding this, and based on the precautionary principle, groundwater is regarded as very sensitive.

The following groundwater receptors are identified for impact assessment:-

- The Regionally Important Aquifer underlying the electricity substation site and the underground electricity line. This aquifer can be considered as being of High Importance;
- The Locally Important Aquifer underlying a section of the electricity substation site. This aquifer can be considered as being of Medium Importance;
- The WFD status of the underlying Lough Funshinagh GWB;
- Local private groundwater abstractions in the lands surrounding the electricity substation site; and,
- The local turloughs and karst features in the surrounding lands.

Surface waters such as the Cross (Roscommon) River are also sensitive to potential contamination. These rivers are known to be of trout potential and are locally important for fishing (refer to **Chapter 5**). We note the lack of any streams or rivers in the vicinity of the electricity substation site which could potentially be receptors. The River Shannon downstream of Lough Ree is scoped out of the assessment due to the large volumes of water in the lake and a quantitative analysis of flow volumes along



the Cross (Roscommon) River.

The following surface water receptors are identified for impact assessment:-

- The Cross (Roscommon) River in the vicinity and downstream of the underground electricity line. This river can be considered to be of Very High Importance based on its Q-ratings; and,
- The WFD status of all SWBs downstream of the project site.

In terms of designated sites, no designated sites are hydrologically connected by surface water pathways to the electricity substation site. Any potential connections are indirect and will be via groundwater flowpaths over a long distance (several kms). Meanwhile, a direct hydrological connection exists between the underground electricity line and the River Shannon Callows SAC/pNHA and the Middle Shannon Callows SPA. Based on the precautionary principle, the following designated sites will be included in the impact assessment:-

- Lough Ree SAC/SPA/pNHA;
- Ballynamona Bog and Corkip Lough SAC; and,
- Castlesampson Esker SAC/pNHA.

Lough Funshinagh has been scoped out of the impact assessment as traced underground connections have revealed that the groundwater from the lough flows to the south and discharges in the vicinity of the Cross (Roscommon) River. Therefore, the project site is downgradient of the Lough Funshinagh SAC/pNHA and cannot affect the conservation objectives of this SAC.

Lough Slawn pNHA, on the eastern side of Lough Ree, has been scoped out of further assessment as it is located upgradient of the substation site and electricity line, is located on the opposite lake shore (eastern shore) of Lough Ree and is located c. 10.5km northeast of the substation site.

Furthermore, the River Shannon Callows SAC/pNHA and the Middle Shannon Callows SPA have been scoped out of the impact assessment due to Lough Ree acting as a hydrological buffer between the electricity substation site and these designated sites. Furthermore, increasing flow volumes in the Cross (Roscommon) River will provide adequate dilution and will prevent any potential contamination sources associated with the underground electricity line from reaching these designated sites.

7.4 Description of Likely Effects

7.4.3.11 Effects on Designated Sites

The groundwater dependent designated sites in the vicinity of the project include:-

- Ballynamona Bog and Corkip Lough SAC; and,
- Castlesampson Esker SAC (turlough)

The surface water dependent designated site in the vicinity of the project include:-

• Lough Ree SAC/SPA/pNHA

The surface and groundwater connections from the project site could, in the absence of mitigation, transfer poor quality surface and groundwaters that may affect the conservation objectives of these designated sites.

The other designated sites listed at **Section 7.3.13** above are excluded from further assessment.



Moyvannan Electricity Substation

Attribute	Description
Receptor	Down-gradient water quality and designated sites.
Pathway/Mechanism	Alteration of groundwater recharge. Effects on groundwater quality. Effect on surface water quality.
Pre-Mitigation Effect	Indirect, negative, imperceptible, short term, unlikely effect on designated sites.

Table 7.30: Effects on Designated Sites

7.5 Mitigation & Monitoring Measures

7.5.1 Construction Phase

7.5.1.11 Designated Sites

Mitigation measures have been outlined within **Sections** Error! Reference source not found. to Error! Reference source not found. which will ensure the protection of groundwater quality and quantity leaving the project site. These mitigation measures include:-

- Site specific drainage design ensuring all water recharges to ground and mimics the existing hydrological regime;
- Protection of groundwater from cement-based materials; and,
- Protection of groundwater from the potential release of silt and hydrocarbons.

Furthermore, mitigation for the protection of surface water quality along the underground electricity line associated with the directional drilling is detailed at **Section** Error! Reference source not found..

Lough Ree SAC/SPA/pNHA

It is assessed that there will be no likely significant effect on Lough Ree SAC/SPA/pNHA for the following reasons:-

- The small scale and shallow nature of the proposed works;
- The lack of any direct hydrological connection between the project site and Lough Ree (the only potential connection is via groundwater flowpaths);
- The separation distance between the electricity substation site and Lough Ree (c. 2.3km);
- The scale of the project in comparison with the scale and volume of water within the Funshinagh GWB within which groundwater flows towards Lough Ree

 the likelihood of significant effects is limited due to dilution;
- The scale of the project in comparison with the scale and volume of water within Lough Ree and the River Shannon – the likelihood of significant effects is limited due to dilution; and,
- Nevertheless, mitigation measures for the protection of surface and groundwater water quality will be implemented during the construction phase of the project to ensure that there is no deterioration in local water quality.

Ballynamona Bog and Corkip Lough SAC

It is assessed that there will be no likely significant effect on Ballynamona Bog and Corkip Lough SAC for the following reasons:-



- The small scale, shallow and transient nature of the proposed works along the underground electricity line;
- The works will be located in the carriageway of the existing road network;
- The trench excavations will be shallow and above the groundwater table;
- No groundwater dewatering is proposed along the underground electricity line;
- The lack of any direct hydrological connection between the underground electricity line and this SAC;
- The separation distance between the underground electricity line and the SAC (c. 900m);
- The scale of the proposed works along the underground electricity line in comparison with the scale and volume of water within the Funshinagh GWB within which supplies groundwater to Corkip Lough; and,
- Nevertheless, mitigation measures for the protection of surface and groundwater water quality will be implemented during the construction phase of the project to ensure that there is no likelihood of a deterioration in local water quality.

Castlesampson Esker SAC (turlough)

Please note the sand and gravel element of the SAC is not groundwater dependent, and therefore will not be impacted directly or indirectly by the proposed development. The text below relates to potential to impact on the turlough qualifying interest of the SAC.

It is assessed that there will be no likely significant effect on Castlesampson Esker SAC for the following reasons:-

- The small scale, shallow and transient nature of the proposed works along the underground electricity line;
- The trench excavations will be shallow and above the groundwater table;
- No dewatering is proposed along the underground electricity line;
- The lack of any direct hydrological connection between the underground electricity line and this SAC);
- The separation distance between the underground electricity line and the SAC (c. 3.8km);
- The scale of the proposed works along the underground electricity line in comparison with the scale and volume of water within the Funshinagh GWB within which supplies groundwater to the turlough; and,
- Nevertheless, mitigation measures for the protection of surface and groundwater water quality will be implemented during the construction phase of the project to ensure that there is no likelihood of a deterioration in local water quality.

7.6 Residual Effects

7.6.1 Construction Phase

7.6.1.11 Designated Sites

The likelihood of effects are limited due to the short-term and transient nature of the proposed works. Furthermore, proven and effective measures to mitigate the risk of surface and groundwater contamination have been proposed which will break the pathway between the likely source and downstream receptors. These mitigation



measures will ensure that surface water runoff and groundwater recharge will be equivalent to baseline conditions and will therefore have no impact on water quality and/or the status or ecology of protected species and habitats within designated sites. The residual effects are assessed to be negative, imperceptible, indirect, shortterm, unlikely effect on designated sites.

For the reasons outlined above, no significant effects are assessed as likely to occur.

7.7 Summary

During each phase of the project (construction, operation and decommissioning), a number of activities will take place which will have the potential to affect the hydrological/hydrogeological regime or water quality at the site or its vicinity. These effects generally arise from sediment input from runoff and other pollutants such as hydrocarbons and cement based compounds.

Drainage measures, pollution control and other preventative measures have been incorporated into the project design to minimise any likely adverse impacts on water quality and downstream designated sites. The existing hydrological regime is characterised by high rates of groundwater recharge and low rates of surface water runoff. There are no surface water streams or rivers in the vicinity of the electricity substation site. A turlough is located ~300m to the south of the electricity substation.

The management of water is the principal means of significantly reducing sediment runoff arising from construction activities and to control runoff and recharge rates. The key surface water control measure is that there will be no direct discharge of runoff from any works area. This will be achieved by design methods (i.e. surface water treatment measures – drains, check dams, settlement ponds and buffered outfalls) which will ensure that all water generated at the site will recharge to ground as per existing greenfield rates.

Preventative measures also include fuel, concrete and wastewater management which will be incorporated into the detailed CEMP to be prepared prior to the commencement of project.

Overall, the project presents no likelihood of significant effects on surface or groundwater quality following the implementation of the proposed mitigation measures; while the project can be constructed and operated without affecting the WFD status of any waterbody or adversely affecting the achievement of WFD status. Additionally, this assessment has determined that there is no likelihood for significant cumulative effects to arise due to the construction or operation of the project.





Appendix E Outline CEMP

Natura Impact Statement

Moyvannan Electricity Substation

Energia Renewables ROI Limited

SLR Project No.: 501.065165.00001

30 August 2024





Moyvannan Electricity Substation

Environmental Impact Assessment Report

Annex 3.4: Planning-Stage Construction & Environmental Management Plan

Energia Renewables ROI Limited

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1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Planning-Stage Construction & Environmental Management Plan (CEMP) for the construction of the Moyvannan Electricity Substation.

1.1 Purpose of this Report

This CEMP has been prepared to outline the management of activities during the construction of the project to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments made in respect of the project and the measures to be adopted to ensure compliance with legislation and the requirements of statutory bodies.

This CEMP (Planning-Stage/Preliminary) is a live document and will be updated by the appointed contractor prior to the commencement of development. Prior to the commencement of construction, the updated CEMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (ECoW), as necessary, to confirm the appropriateness of the measures set out therein. This CEMP will form part of the main construction works contract. The contractor will take account of the structure, content, methods and requirements contained within the various sections of this CEMP when further developing this document (to include environmental plans and other related construction management plans and method statements) as required.

1.2 Objectives of this CEMP

This CEMP has been developed in accordance with the Institute of Environmental Management and Assessment (IEMA) *Practitioner Environmental Management Plans Best Practice Series Volume 12 (December 2008)* and has been designed to address the proposed environmental construction strategies that are to be implemented in advance of and during the construction of the project.

This CEMP aims to define good working practices as well as specific actions required to implement mitigation requirements as identified in the Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), the planning process, and/or other licensing or consenting processes.

1.3 Structure of this CEMP

The CEMP has been structured such that it can be read as consolidated document or as discreet documents addressing specific environmental topics. In particular, we refer to the technical annexes enclosed which address specific matters such as spoil management, surface water management, waste management, and emergency responses.

A copy of the CEMP will be maintained in the site offices for the duration of the construction phase and will be available for review at any time. The contractor's EM will be responsible for the continued development of the CEMP throughout the construction phase.

Where specific construction management plans or method statements are prepared by the contractor, these will be inserted into the relevant section of this CEMP.

An overview of the structure of the CEMP is provided at Figure 1.



1.4 Roles & Responsibilities

Energia Renewables ROI Limited, and its appointed Project Manager, will be responsible for the overall implementation of the environmental measures and procedures set out in the CEMP. The role of the Project Manager relates to compliance monitoring with the CEMP and other planning/environmental/licensing requirements. Additionally, the Project Manager shall be empowered to halt works where he/she considers that continuation of the works would be likely to result in a substantial environmental risk.

The Project Manager will also carry out site checks that the works are being undertaken in accordance with the CEMP and will prepare a record of same.

The contractor will appoint an EM who will be responsible for coordination and development of the CEMP and any other surveys, reports or construction management plans necessary for the discharge of the requirements of the CEMP. The EM will also review the contractors construction management plans as required, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group (see below) and required liaisons between Energia Renewables ROI Limited, the contractor, and other statutory authorities.

Prior to commencement of construction, the contractor will identify a core Environmental Management Group, comprising of specific project personnel and including the Project Manager, EM, and ECoW. The Environmental Management Group will meet monthly to discuss the monthly environmental report and will advise site personnel on areas where improvements may be made on site. The group will draw on technical expertise from relevant specialists where required and will liaise with other relevant external bodies as required.

1.5 Reporting Procedures

Appropriate reporting procedures are key to the proper implementation of the measures outlined within this CEMP, and include reporting between parties involved in the construction of the project and also external stakeholders, such as the relevant local authorities.

Emergency and environmental incident reporting procedures are set out in the Environmental & Emergency Response Plan (see **Annex 1**).

2.0 Description of the Project

Energia Renewables ROI Limited intends to construct the Moyvannan Electricity Substation which will consist of:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the Athlone-Lanesborough overhead transmission line and the provision of 2 no. interface masts;
- Approximately 7.5km of underground electricity line between the electricity substation and the permitted Seven Hills Wind Farm grid connection infrastructure; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The entirety of the project is located within the administrative area of County Roscommon; while electrical equipment suppliers, construction material suppliers and



candidate quarries which may supply aggregates are located nationwide.

Various environmental reports have been prepared in respect of the project and have been utilised in the preparation of this CEMP, including:-

- Environmental Impact Assessment Report (Galetech Energy Services); and
- Natura Impact Statement (SLR Consulting).

3.0 General Construction Sequence

The construction phase is likely to last for approximately 15-18 months from commencement of further site investigations through the installation of underground electricity line, construction of the electricity substation and concluding with the commissioning of the electrical apparatus, site reinstatement and landscaping.

The construction phase of the development will comprise a 6 no. day week with normal working hours from 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays or public holidays. It may, however, be necessary to undertake works outside of these normal hours in exceptional circumstances or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

3.1 Construction Method

The construction method will consist of the following general sequence:-

- Establishment of necessary traffic management measures. Substation site entrance works to be completed ensuring that requisite visibility splays are provided;
- Installation of preliminary surface water control measures;
- Establishment of temporary construction compound;
- Progressive construction of the access track and installation of drainage system and surface water control measures;
- As construction progresses through the site, temporary (construction phase only) acoustic and visual screening barriers will be installed to the south of the access track leading to the substation compound and to the south of the substation compound itself. These barriers will be installed to minimise the visibility of, and noise emissions from, construction activities which may cause disturbance to avian species utilising the turloughs located to the south of the electricity substation site;
- Site preparatory and groundworks associated with the substation compound including control building foundations;
- Establishment and continued management of spoil deposition areas;
- Construction of the control building;
- Construction of bases or plinths for electrical apparatus;
- Erection of palisade fencing around substation compound;
- Installation of internal and external electrical apparatus in control building and within compound;
- Installation of underground electricity line (including joint bays) between electricity substation and Seven Hills Wind Farm grid connection infrastructure (junction of the L7636 and R363);
- Preparatory groundworks associated with the interface mast and construction of mast foundations;
- Erection of interface masts;
- Decommissioning of 1 no. existing wooden pole-set;



- Installation of underground electricity line between substation and interface masts;
- Commissioning and testing of electrical apparatus within substation;
- Connection of electricity substation to the underground electricity line and to the 110kV Athlone-Lanesborough electricity transmission line;
- Final commissioning of electrical apparatus and underground electricity line; and,
- Progressive site reinstatement, restoration, landscaping and planting proposals including the installation of stockproof fencing and the erection of gates.

In addition to the roles of the EM and ECoW described above, the construction phase will be supervised by a range of environmental and engineering specialist personnel; including a Project Supervisor for the Construction Stage (PSCS), Archaeological Clerk of Works (ACoW), and Geotechnical Clerk of Works (GCoW), among others; who will liaise closely with the appointed contractor's EM to monitor and to ensure that all applicable measures are implemented.

3.2 Site Entrance

Access to the electricity substation site will be provided via an existing agricultural access point from the L7551 local public road. The proposed site entrance will not be required to accommodate any abnormal size loads but will be upgraded to ensure ease of access and egress for standard heavy-goods vehicles (HGVs) which will deliver construction materials and electrical apparatus to the site. Works at the site entrance will comprise the removal of an existing agricultural gate and post-and-wire fencing.

The L7551 is a narrow single-lane carriageway which is assessed as conveying extremely low volumes to traffic. Due to the characteristics of the road, it has been assessed that the road has a design speed of 60 kilometres-per-hour (kph). In accordance with Transport Infrastructure Ireland publication *DN-GEO-03031 Rural Road Link Design*; and having regard to the low traffic volumes utilising the public road and proposed site entrance; a visibility splay of 70m in each direction, taken from a point 2.4m back from the road edge, is deemed appropriate and has been provided in this instance. As a consequence of the provision of the visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone walls.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. Roadside hedgerows will be regularly trimmed (outside of the bird breeding season) to ensure that visibility splays are maintained throughout the operational phase of the proposed development.

3.3 Access Track

A total of approximately 630m of on-site access track will be required for construction purposes and for site access during the operational phase. The access track shall be similar to normal agricultural tracks but with a slightly wider typical running width of approximately 4m. The access track will largely be unsealed and constructed of crushed stone material to allow for permeability; however, c. 100m of access track within the electricity substation compound will be finished with concrete (in accordance with EirGrid specifications). Due to the findings of site investigations and the geological characteristics of the site, usable rock material for the construction of the access track is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported from local quarries.



The on-site access tracks will generally be constructed as follows:-

- Topsoil and subsoil will be excavated, side-cast and stored in separate mounds in appropriate areas adjacent to the access track;
- Crushed stone will be laid on a geo-textile mat (where required) and compacted in layers to an appropriate depth. The access track will not be finished with tar and chips or concrete (other than a short section within the electricity substation compound which shall be finished with concrete) and the surface will be permeable to allow incidental rainfall to percolate to ground; thus avoiding significant volumes of surface water run-off being generated and avoiding changes to the natural drainage regime;
- Drainage infrastructure and the underground electricity line will be installed adjacent to the access track; and,
- The edges of the access track will be finished and reinstated with excavated material and reseeded or allowed to vegetate naturally.

3.4 Temporary Construction Compound

Topsoil will be removed from the required area and side cast for temporary storage adjacent to the compound area. The compound base will be made up of well graded aggregates, compacted as necessary. A designated waste management area and fuels and chemicals storage area will be provided along with site offices, parking, staff welfare facilities and equipment storage areas. The compound will be fenced with temporary security fencing to restrict access. Following the completion of the construction phase, the temporary construction compound will be fully removed and the compound will be reinstated with excavated material and reseeded.

3.5 Chemical Storage and Refuelling

Storage areas for oils, chemicals and fuels will comprise bunded areas of hardstand of sufficient capacity within the temporary construction compound. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any hydrocarbons that may be present. As part of the design process, a 50m buffer has been observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone.

From the construction compound, fuel will be transported to works area by a 4x4 in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity. As above, a 50m buffer will be observed around all surface water features and no refuelling will be permitted within this zone.

3.6 Electricity Substation

The footprint of the substation (overall compound area) will measure approximately 8,500m² and will be surrounded by a palisade fence, with associated gates, of 2.6m in height for safety and security reasons. The electricity substation will contain a control building and all necessary electrical equipment and apparatus to facilitate the export of electricity from the permitted Seven Hills Wind Farm to the national grid. Ancillary



infrastructure located within the footprint of the compound will include busbars, insulators, cable sealing ends, and lightning poles.

The site of the electricity substation is gently sloping, to the south/southwest, with approximate ground elevations ranging from c. 80m AOD in the north of the site (interface masts) to c. 69m AOD in the southeast (site entrance). There will be a requirement to undertake minor modifications to ground levels in order to achieve the required levels for the control building, structures and electrical equipment. A 'cut and fill' exercise will be implemented whereby excavated material at higher elevations will be excavated and used to make up levels at areas of lower elevation. This process, which accords with best practice construction techniques, will avoid the excavation of significant volumes of soil or the importation of significant volumes of stone aggregates to provide a level compound.

The substation compound will be surfaced with c. 400mm free-draining crushed stone such that rainwater can percolate to ground. Site investigations undertaken to date indicate that a sufficient level of usable rock material is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported to the project site from local quarries.

The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape.

The electricity substation will contain a control building which will measure approximately 25m x 18m (gross floor area of c. 450m²) and will have an overall height of approximately 8.5m to ridge height. The building shall be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The control building will contain a control room to allow operatives monitor and manage the operation of the electrical apparatus and will also include a generator room, workshop/storage facility and welfare facilities.

During the project design process, the Developer engaged with Uisce Éireann to determine the feasibility of obtaining a water supply for the control building. Uisce Éireann confirmed that existing water infrastructure, with sufficient capacity to serve the project, is located along the adjoining L7551 local road and that, subject to a formal connection agreement, water could be provided to the control building.

Wastewater arising from the control building will be stored in a sealed sub-surface foul holding-tank and will be removed from site as required by a local licensed waste collector. Water supply and waste water management proposals of this nature are common practice for developments of this type located in remote/rural areas with infrequent usage.

Electrical equipment; including, but not limited to, busbars, switchgear, insulators, cable sealing ends, and lightning poles; will be located outside the control building (within the palisade fence).

3.7 Interface Masts & Underground Electricity Line

The interface masts will be lattice-type structures and will be located immediately beneath the Athlone-Lanesborough overhead electricity transmission line. The masts will have a maximum height of 16m and a permanent above-ground footprint of c. 100m² (total; c. 50m² per mast) with concrete foundations below ground to a depth of c. 2m.

One of the interface masts will replace an existing wooden pole-set associated with the existing overhead transmission line. The wooden poles and electricity line



suspension equipment will be decommissioned and removed from site for re-use or recycling, where possible, or disposal at a licensed waste handling facility.

At the location of the interface masts, the existing overhead transmission line will be broken and the proposed underground electricity line (c. 270m) will connect the existing overhead line to the electricity substation.

3.8 Underground Electricity Line

The electricity substation will be connected to the permitted Seven Hills Wind Farm grid connection infrastructure via c. 7.5km of 110kV underground electricity line. From the substation, the electricity line will be located within the proposed access track to its junction with the L7551 local road and will then follow the L7551, L7556, L2018, L7731, R362, L2023, and L7636 to its junction with the R363 at Brideswell.

The electricity line will be installed within ducting in an excavated trench of c. 1.3m deep and c. 0.6m wide and pulled through the ducting in sections of c. 750m in length or depending on the length of electricity line required. Cable (electricity line) lengths will be connected at designated 'joint bays' to be constructed along the route. It is estimated that 11 no. joint bays will be required along the route of the underground electricity line; however, the exact number to be constructed will be confirmed as part of the post-consent detailed design process. Joint bays will, insofar as possible, be located within roadside verge or at agricultural access points to minimise the extent of joint bay infrastructure within the paved carriageway of the public road network.

Following the installation of the ducting and joint bays, ground levels will then be made up using appropriate material in accordance with the requirements of EirGrid/ESB Networks and finished/reinstated to the requirements of the Planning Authority (public road) or landowner (private lands). Further, all public roads within which it is proposed to install the underground electricity line will be subject to a fullcarriageway reinstatement (re-surfacing) of the relevant road section thus ensuring that there are no long-term effects on the public road network.

All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials will be stored separately (subsoil and aggregates) for use during the reinstatement of the trench and joint bays or disposed of at an appropriate licensed facility as necessary. The sequence of works is typically as follows:-

- Identify existing underground services prior to excavation;
- Excavate the trench to the required dimensions;
- Place a blinding layer at the base of the trench;
- Place and joint the high-density polyethylene (HDPE) power ducts using ties at 3m intervals;
- Lay in and compact a layer of leanmix concrete around and above ducts and place red marker strips above;
- Install 2 no. HDPE communications cable ducts;
- Lay in and compact an additional layer of leanmix concrete and place further red marker strips above;
- Final backfill layer to include yellow warning tape; and,
- Appropriate reinstatement, as discussed above.

Horizontal Directional Drilling (HDD) will be undertaken at 1 no. location along the underground electricity line. HDD will be undertaken at the intersection of the underground electricity line and the Cross (Roscommon) River and the use of this



methodology will avoid any in-stream works or any direct or indirect effect on the existing bridging structure. Launch and receptor pits will be excavated at either side of the river; a minimum of 15m away from the river; to accommodate the drilling rig. The bore will be at a minimum depth of 2.5m below the bridging structure to ensure that there are no impacts on the structural integrity and stability of the bridges. Following the installation of the ducts, the launch and receptor pits will be fully reinstated. Marker posts will be placed at either side of the road to indicate the location and alignment of the electricity line.

3.9 Construction Waste Management

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical toilets;
- Plastics; and,
- Oils and chemicals.

Waste disposal measures proposed include:-

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, subsoil, concrete, rock, tiles, oils/fuels, metals, electricity cable off-cuts, dry recyclables (e.g. cardboard, plastic, timber);
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left-over materials (e.g. timber off-cuts) and any suitable demolition materials shall be re-used on-site;
- Uncontaminated excavated material (topsoil, subsoil, etc.) will be re-used onsite in preference to importation of clean inert fill;
- If suitable rock is encountered, it will be utilised for infill during construction;
- All waste leaving the site will be transported by licensed contractors and taken to suitably licensed facilities and will be recycled or reused where possible; and,
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

3.10 Construction Employment

It is estimated that up to 40 no. people will be employed during the approximately 15-18 month construction phase. The actual number will depend on the activities being undertaken at any given time and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor appointed by the Developer, but it is likely that the workforce will include labour from the local area.

3.11 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:-

- Articulated trucks (HGVs) to bring initial plant and machinery to site and later to bring electrical equipment and other construction materials;
- Tipper trucks and excavation plant involved in site development and excavation works;
- Miscellaneous vehicles and handling equipment, including vehicles associated with construction workforce.



Effects from construction traffic could include temporarily increased local traffic levels and traffic noise; while disruption is likely to occur during the installation of the underground electricity line. Construction traffic on the local road network and construction works along the electricity line route will be managed in accordance with a Traffic Management Plan and the requirements of Roscommon County Council.

Traffic management measures will be implemented during the construction phase, as follows:-

- Signage on approach roads and at the site entrance giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads, where restrictions have to be put in place (e.g. along the electricity line route). Local access for residents and landowners will be maintained at all times;
- Appropriate arrangements will be implemented for school bus routes and/or other public transport services;
- One way systems will be implemented for construction traffic, where possible, to prevent construction vehicles meeting;
- Speed limits will be strictly enforced;
- A designated person will be appointed to manage access arrangements and act as a point of contact to the public; and,
- All reinstatement works to be carried out in full consultation with Roscommon County Council.

4.0 Environmental Management Measures

4.1 'Designed-In' Measures

The following measures will be implemented, as standard, as part of the construction of the project:-

- Topsoil and subsoil excavated during the construction of the electricity substation and ancillary infrastructure will be appropriately stockpiled and, in so far as is practicable, re-used to reinstate the site. Any excess material arising will be deposited at the dedicated spoil deposition areas;
- Following the completion of construction, the deposition areas will be graded to match the profile of surrounding land, covered with topsoil and reseeded. Works at the spoil deposition areas will be monitored, on a weekly basis during the construction phase and monthly for a 6-month period thereafter, by an appropriately qualified Geotechnical Clerk of Works;
- A 'cut and fill' exercise will be implemented at the electricity substation site whereby excavated material at higher elevations will be excavated and used to make up levels at areas of lower elevation. This process, which accords with best practice construction techniques, will avoid the excavation of significant volumes of soil or the importation of significant volumes of stone aggregates to provide a level compound;
- The substation compound will be surfaced with c. 400mm free-draining crushed stone such that rainwater can percolate to ground thus avoiding significant generation of surface water;
- The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape;



- Wastewater arising from the control building will be stored in a sealed subsurface foul holding-tank and will be removed from site as required by a local licensed waste collector;
- In accordance with Transport Infrastructure Ireland publication DN-GEO-03031 Rural Road Link Design; and having regard to the low traffic volumes utilising the public road and proposed site entrance; a visibility splay of 70m in each direction, taken from a point 2.4m back from the road edge, is deemed appropriate and has been provided in this instance. As a consequence of the provision of the visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone walls;
- Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. Roadside hedgerows will be regularly trimmed (outside of the bird breeding season) to ensure that visibility splays are maintained throughout the operational phase of the proposed development;
- The access track at the electricity substation site will largely be unsealed and constructed of crushed stone material to allow for permeability; however, c. 100m of access track within the electricity substation compound will be finished with concrete (in accordance with EirGrid specifications);
- Some cut/fill in the construction of the access track will be necessary to ensure that horizontal and vertical alignments are suitable to accommodate HGV loads and drainage infrastructure. Where excess material arises from the construction of the access track, it will be utilised in the construction of trackside berms, if required, or permanently stored at the proposed spoil deposition areas;
- Temporary welfare units, including chemical toilets, to be provided at the temporary construction compound for construction staff will be sealed units to ensure that no discharges escape into the local environment. These will be supplied and maintained by a licensed supplier. Potable water (for drinking, food preparation, and hand washing etc.) will be supplied on-site by water dispensers and this will also be sourced and maintained by a licensed supplier;
- The construction compound will be marked out and fenced to prevent encroachment onto non-designated areas. Following the completion of all construction activities, the compound will be decommissioned with all structures removed and fully reinstated. Reinstatement will involve removing crushed stone and underlying geotextile, covering with topsoil and reseeding;
- The temporary construction compound has been located and designed such that all cabins, storage containers, waste management facilities and bunded distance areas will be located а minimum of 50m from all watercourses/drainage ditches in order to minimise the risk of pollution and the discharge of deleterious matter. Stormwater which may arise from the roofs of cabins, containers or from sealed bunds will be passed through an oil interceptor prior to being discharged to the local environment;
- Given the linear nature of the electricity line route, it is likely that a number of small material storage areas will be utilised along the route during the construction phase to minimise the transportation of construction materials (e.g. ducting, electricity line, joint bays, etc.). Such temporary compounds are likely to be located within agricultural farmyards or business premises along the route;
- Joint bays along the route of the underground electricity line will, insofar as possible, be located within roadside verge or at agricultural access points to minimise the extent of joint bay infrastructure within the paved carriageway of the public road network;



- Following the installation of the ducting and joint bays, ground levels will then be made up using appropriate material in accordance with the requirements of EirGrid/ESB Networks and finished/reinstated to the requirements of the Planning Authority (public road) or landowner (private lands). Further, all public roads within which it is proposed to install the underground electricity line will be subject to a full-carriageway reinstatement (re-surfacing) of the relevant road section thus ensuring that there are no long-term effects on the public road network;
- HDD launch and receptor pits will be excavated at either side of the Cross (Roscommon) River; a minimum of 15m away from the river; to accommodate the drilling rig. The bore will be at a minimum depth of 2.5m below the bridging structure to ensure that there are no impacts on the structural integrity and stability of the bridges. Following the installation of the ducts, the launch and receptor pits will be fully reinstated. Marker posts will be placed at either side of the road to indicate the location and alignment of the electricity line;
- All HDD works will be undertaken in strict accordance with best practice methodologies with surface water measures being installed; including implementation of exclusion zones within 15m of the river, installation of double silt fencing, avoidance of any refuelling activities within 100m of the river, bunding of the Clear Bore™ batching, pumping and recycling plants, spill kits being available in the event of an accidental spillage or leakage, and the provision of adequately sized skips for the temporary storage of drilling arisings and drilling flush. All such arisings and flush will be disposed of to a licensed waste management facility;
- At the electricity substation site, a series of embedded best-practice drainage measures have been incorporated within the project design. Firstly, clean water drains will be installed upslope of the works area to intercept incidental surface water runoff and direct it away from the works area to prevent it becoming contaminated. Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain; before water is discharged by a buffered outfall or level spreader at greenfield rates. Water will be discharged from the clean water drains over grassland to provide filtration and to ensure that no silt or sediment is discharged to the drainage network;
- All surface water runoff from works areas, excavations, stockpiles, or from dewatering activities at the electricity substation site will be intercepted by downslope dirty water drains. The dirty water drains will include check dams to limit flow rates to avoid any erosion or scouring of the drains. The drains will direct dirty water to silt traps (also known as silt/settlement/sediment/stilling ponds) where water will be stored for an appropriate period of time such that silt/sediment or suspended material falls to the floor of the silt trap. The treated (clean) water will then be discharged from the silt trap via a buffered outfall or level spreader, at greenfield rates, over grassland to provide a further layer of filtration and treatment;
- Surface water control measures will be implemented as construction progresses through the substation site; however, prior to the commencement of earthworks, temporary silt/sediment control infrastructure (e.g. silt bags and siltbusters) may be installed, as required, until the full range of construction phase measures are installed;
- Following the completion of construction, it is likely that the majority of surface water infrastructure will be maintained to ensure the appropriate drainage of the site during the operational phase; however, some infrastructure, such as that installed at the temporary construction compound, will be decommissioned;



- Stormwater drainage infrastructure will be installed around the electricity substation control building to capture any runoff from roofed or paved areas; while permanent drainage infrastructure will be installed at the perimeter of the electricity substation compound. All stormwater and surface water from the electricity substation compound will be directed to a permanent attenuation pond which will allow for the storage of water until such time as all suspended sediment is removed and the water can be safely discharged. Water will be discharged via a buffered outfall or level spreader over grassland. Additionally, all stormwater and surface water from the substation compound will be passed through an oil/hydrocarbon interceptor to prevent the discharge of any hydrocarbons;
- Surface water discharge rates have been designed to mimic greenfield runoff rates thus avoiding any long term alteration to the hydrological or hydrogeological regime of the substation site;
- In order to assist in the assimilation of the electricity substation into the existing landscape fabric, a series of landscaping proposals have been incorporated into the design of the project and comprise the following:-
 - Bolstering of existing field boundaries;
 - Planting of new hedgerows and trees around the electricity substation;
 - Planting of wild flower or wild grass mixes at infrastructure margins, residual areas of the substation site and atop the western spoil deposition area;
- Hedgerow and tree species to be planted will be native Irish species and will be selected to complement those current found within the local landscape
- Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used;
- The construction phase will be supervised by a range of environmental and engineering specialist personnel; including a PSCS, ECoW, ACoW, and GCoW, among others; who will liaise closely with the EM to monitor and to ensure that all applicable measures are implemented; and,
- Waste will be generated during the operational phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best-practice and all regulations at a licensed facility.

4.2 Population & Human Health

No measures, specific to population and human health, are necessary during the construction phase. Local residents and communities will be protected through the implementation of measures relevant to other topics including the protection of water quality, minimisation of dust emissions, minimisation of noise emissions, and appropriate traffic management procedures.

4.3 Biodiversity

4.3.1 Nature Conservation Sites, Fisheries and Aquatic Ecology

In order to mitigate likely effects during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes.



During the construction phase, all works associated with the construction of the project will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Any groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

4.3.1.1 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only likely to be present during certain months of the year, and may not exist between ~May–November, thus construction proposed between May-November is not likely to affect the turlough. Meanwhile, there is only 1 no. watercourse crossing along the underground electricity line.

The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

Mitigation through earthworks management and site drainage

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.

Management of surface water runoff and subsequent treatment prior to release offsite will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed downgradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;
- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;



- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;
- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change;
- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

<u>Silt Fences</u>

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

<u>Silt Bags</u>

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works



Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

<u>Monitoring</u>

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

4.3.1.2 Surface Watercourses

The primary mitigating factor in relation to downgradient surface water bodies is the distinct lack of surface watercourses which drain the electricity substation site and the surrounding area. The rainfall falling on the site recharges to the underlying groundwater aquifer. There are no small streams (10-501/s) which would typically be seen on upland slopes.

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment. Further details are provided at **Chapter 7**.

4.3.1.3 Accidental Release of Hydrocarbons

Mitigation measures to avoid the release of hydrocarbons at the project site are as follows:-

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;
- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,



 An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan (see Annex 3.4). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

4.3.1.4 Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

4.3.1.5 Release of Cement Based Products

Mitigation by Avoidance

The following mitigation measures are proposed:-

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport



via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);

- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

4.3.1.6 Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- There will be no storage of material/equipment or overnight parking of machinery inside a 15m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative



measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;

- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

4.3.1.7 Karst Features

The following mitigation measures are proposed:-

 Site drainage management will be put in place in order to prevent any poor quality drainage water reaching the turlough during the construction phase. This includes 3 no. layers of silt fencing downgradient of works areas, as well as the general separation of clean and dirty water, while maintaining the overall hydrological regime of rainfall recharge to ground; and,

Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed at **Chapter 7**, will provide a high level of protection to groundwater and surface water quality and ensure that groundwater quality and karst features will not be significantly affected, thus protecting the groundwater quality of the Karstic Bedrock Aquifer.



4.3.2 Habitats

The project footprint does not overlap with any high-value terrestrial habitats and will be located almost entirely within existing roads and improved agricultural grassland. No treelines or hedgerows will be removed.

To avoid widespread disturbance to habitats, access within the project will be restricted to the footprint of the proposed works corridor and no access between different parts of the project will be permitted, except via the proposed works corridor. An Ecological Clerk of Works (ECoW) will be employed throughout the construction phase to ensure that construction activities do not encroach, unnecessarily, into any important habitats.

4.3.3 Invasive Plants

The following will be implemented to avoid the accidental spread of any invasive or non-native species:-

- An invasive species management plan will be developed and implemented. This will include the following general prevention and containment measures and species-specific treatment measures below; and,
- An Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of any invasive and non-native species sensitivities of the project and to undertake pre-construction surveys, enforcing any exclusion zones and mitigation measures as required.

4.3.3.1 General Prevention Measures

- Use of toolbox talks as part of site introduction to workers, including what to look out for and what procedures to follow if invasive species are observed;
- Signs will be used to warn workers of invasive species contamination;
- Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;
- Unwanted material contaminated with invasive species will be transported offsite by an appropriate licenced waste contractor and disposed of at a suitably licenced facility (NRA, 2010); and,
- Good hygiene practices will be adhered to including the removal of build-up of soil on equipment; keeping equipment clean; washing vehicles exiting the site using a pressure washer to prevent the transport of seeds; storing wastewater from washing facilities securely and treating to prevent spread of invasive species; checking footwear and clothing of workers for seeds, fruits or other viable material before leaving the site; any plant material arising from cleaning equipment, footwear and clothing will be carefully disposed of following (NRA, 2010) guidelines in such a manner not to cause the spread of invasive species.

4.3.3.2 General Containment Measures

- A pre-construction walkover survey of the project will be undertaken during the growing season (April to August). This will search for invasive and non-native species, which could change over time. The extent of invasive plant species will be physically marked out; and,
- If any are identified, then appropriate exclusion zone(s) will be implemented. A 1m buffer (except for the named species below) will be used to cordon off invasive species outside the works footprint.

4.3.3.3 Japanese Knotweed



Japanese knotweed code of practice

To assist the Developer and contractors to select the most appropriate treatment option, some excerpts from the Knotweed Code of Practice (Environment Agency, 2013) are reproduced below. The code of practice has been developed by experts in the control of Japanese knotweed and is based on the successes and failures of several Japanese knotweed management plans in the United Kingdom, which is also relevant for Ireland. Therefore, it represents the best available guidance on the different treatment options.

- "Unless an area of Japanese knotweed is likely to have a direct impact on the development, control it in its original location with herbicide over a suitable period of time, usually two to five years;
- Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum;
- Soil containing Japanese knotweed material may be buried on the site where it is produced to ensure that you completely kill it. Bury material at least 5 m deep;
- Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This 'buys time' for treatment that would not be possible where the Japanese knotweed was originally located;
- Due to timing, location, landfill is the only reliable option, but it should be treated as a last resort. Landfill can be expensive and would require haulage, which would increase the risk of Japanese knotweed spreading; and,
- When transporting soil infested with Japanese knotweed to landfill, it is essential to carry out strict hygiene measures. If these standards are not followed, this may result in the spread of this invasive species. Japanese knotweed is a particular problem along transport routes/corridors, where it can interfere with the line of vision and can potentially result in traffic accidents."

Information is also provided by Invasive Species Ireland (ISI) (ISI, 2015) in relation to identification, control and eradication of Japanese knotweed.

Exclusion zone

Prior to the construction phase/excavations at the site, the following bio-security measures will be in place:-

- A 7m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;
- Where part of the exclusion zone encroaches onto an active public access, or beyond a site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary;
- The exclusion zone will be delineated with a secure temporary construction fence, such as herras panels or timber post and netting, and be fitted with appropriate warning/advisory signage;
- Fencing will remain in place for the duration of construction works; and,
- Signs will be placed on the fence to advise site personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force.

Chemical control



The use of physical methods on their own are extremely unlikely to control Japanese knotweed and chemical treatment is recommended.

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with a combination of physical and herbicide control over a period (typically 3-5 years or until no new growth is observed). The control of Japanese knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. To ensure the safety of herbicide applicators and of other public users of the site, it is essential that a competent and qualified person carries out the herbicide treatment. A qualified and experienced contractor will be employed to carry out all treatment work. The contractor will follow the detailed recommendations of the following documents for the control of invasive species and noxious weeds:-

- Chapter 7 and Appendix 3 of the TII Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010);
- Best Practice Management Guidelines for Japanese Knotweed (ISI, 2015); and,
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese knotweed plants identified within the site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese knotweed; however, they may also persist in the soil and/or kill surrounding vegetation.

Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment Agency, 2003) and this is the recommended treatment if knotweed is found within 20m of the Cross [Roscommon] River.

The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within 1-2 years whereas non-persistent herbicides (such as glyphosate) may take over a period of at least 3-years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any regrowth.

Such treatment can take up to 5-years to completely eradicate growth; therefore, further treatment may be required beyond the 3-years. This will be determined by the results of the monitoring. Japanese knotweed does not produce viable seed in Ireland, and therefore seed germination in subsequent years will not be an issue. The optimal period for treatment is May-June and September-October.

4.3.3.4 Montbretia

The following treatment options are recommended by NRA (2010) guidance.

Chemical control

Montbretia can be treated with herbicide during the active growing season. Due to the potential for re-infestation from seeds, corms and/or rhizome fragments, regular monitoring and follow-up treatment, as dictated by the monitoring, will be required over several years. If found near a watercourse crossing, similar bioactive-formulation glyphosate based herbicide treatment is recommended as for Japanese knotweed (see above).

Physical control



Physical control of montbretia is difficult as individual corms easily break from their chains and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried or disposed of to a licensed landfill or incineration facility under licence. The most effective time to remove montbretia is before the flowering/seeding season. The corms are very hardy and are not suitable for composting. Due to the potential for re-infestation from corms, regular follow-up will be required over several years to deal with any re-growth.

4.3.3.5 Snowberry

As snowberry is present within hedgerows in third-party lands, the primary means of preventing spread will be avoidance.

In the event of interaction of works with snowberry, excavation of the entire root system is recommended, in addition to the general prevent and containment measures outlined earlier.

This must be done before the plants' seeds ripen in autumn and plant matter from this process can be disposed of at a licenced landfill site or may be buried on-site up to a depth of >2m.

4.3.4 Birds

To avoid widespread disturbance to birds, access will be restricted to the footprint of the proposed works corridor. Measures proposed above will prevent deterioration of water quality and adverse effects on birds relying on wetland habitats, such as turloughs.

Disturbance is predicted to have the greatest effect on wintering IEF wildfowl and waders that use the turloughs south and southwest of the substation.

The following will be implemented to reduce the possibility of damage and destruction (and disturbance to sensitive species) to occupied bird nests:-

- if site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement survey work will be undertaken to ensure that nest destruction and disturbance is avoided;
- once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase e.g. cover for ground nesting species will be made unsuitable for cutting vegetation or tracking over with an excavator; and,
- a suitably experienced Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of the ornithological sensitivities of the project and to undertake surveys for nesting birds throughout the construction period, and enforcing exclusion areas, as required.

Mitigation measures to avoid disturbance to wintering waders and wildfowl have been developed using the TIDE toolbox (TIDE, 2024), which is a best-practice toolkit that has been developed to avoid disturbance to waders and wildfowl at foraging and roosting locations. The following will be implemented to avoid disturbance to birds during the non-breeding season at the substation location:-

 Most construction (or the most disturbing aspects) at the electricity substation will be undertaken during the breeding season months (April to August inclusive), insofar as possible, to minimise disturbance to non-breeding IEF wildfowl and waders;



- However, as the construction phase is predicted to last 15-18 months, works will be required to be undertaken during the non-breeding season. Prior to the commencement of the non-breeding season (or prior to construction, as appropriate), temporary barriers will be erected to provide acoustic and visual screening of the substation and access track to the substation prior to the non-breeding season, which will remain in place until construction works cease or the end of the non-breeding season (whichever is sooner). The barrier will consist of wooden boarding approximately 5m tall and will face the turloughs to the south and southwest of the substation location. This will reduce the magnitude of high disturbance stimuli (e.g. sudden loud noises, continuous loud noises, workers operating outside of plant and, workers vacating plant), which could otherwise cause disturbance and displacement to birds. The barrier will be erected in such a way that no destruction of existing stonewalls, hedgerows or treelines will occur;
- Where screening cannot be implemented along the access road to the substation farm, construction personnel must stay within their vehicles and ensure that vehicles travel slowly and quietly, without coming to a halt; and,
- Bird monitoring will be undertaken throughout the construction phase during the non-breeding season by a suitability experienced Ecologist. This will be used to check that actions/measures to avoid disturbance are being undertaken correctly and that remedial actions can be implemented if required. The bird monitoring during the non-breeding season will be focused at the turlough locations south and southwest of the substation and will involve conducting fortnightly wader and wildfowl feeding distribution surveys between October to March inclusive. The locations of IEF birds including black-headed gull, common gull, coot, curlew, teal, wigeon, cormorant, great-crested grebe, lesser black-backed gull, mallard, mute swan, lapwing, oystercatcher, tufted duck and whooper swan within 500m of the turloughs will be recorded, as well as any responses to disturbance stimuli.

4.3.5 Terrestrial Mammals (excluding bats)

Measures proposed in **Section 4.3.1** will prevent deterioration of water quality and adverse effects on mammals relying on downstream habitats, such as otter. Habitat features important for mammals will be retained a (e.g. hedgerows and treelines).

A pre-construction walkover survey of the project will be undertaken. This will search for mammal resting/breeding places which could change over time. If any are identified, then appropriate exclusion zone(s) will be implemented and construction activities timed to avoid sensitive periods, such as the breeding season or hibernation, as relevant.

The following will be implemented to reduce the possibility of direct and indirect effects on mammals:-

- limiting constructions works to daylight hours;
- providing exit points for any excavations (e.g. escape planks or spoil runs) so mammals do not become trapped; and,
- if any threatened or legally protected mammals are recorded during the preconstruction walkover survey, the Ecological Clerk of Works make contractors aware of the mammalian sensitivities of the project and to undertake surveys for breeding or resting mammals throughout the construction period, enforcing exclusion areas as required. These are 50m for red squirrel, 100m for pine marten, 150m for otter and 50m for badger. If in the unlikely event that exclusion zones cannot be implemented, advice will be sought from NPWS, and appropriate


mitigation and compensation measures will be put in place and an application will be made to NPWS for a derogation licence if required.

4.3.6 Other Protected Flora

Pre-construction checks will be undertaken for spawning frogs in drainage ditches adjacent to the underground electricity line if construction works are undertaken in February. If found, adults and spawn will be translocated under NPWS licence to suitable alternative locations if present. Pitfall traps and drift fences will be used to capture adult frogs.

Amphibian-proof fencing close to any ponds/pools will be used to prevent frogs or smooth newts from accessing any parts of the project most hazardous to amphibians during the construction phase.

4.4 Land & Soil

4.4.1 Soil, Subsoil and Bedrock Excavation

Mitigation measures at the electricity substation site include:-

- Placement of infrastructure in areas of suitable ground conditions based on detailed site investigation data;
- The soil and subsoil which will be removed during the construction phase will be localised to the proposed infrastructure location;
- The project has been designed to avoid sensitive habitats;
- A minimal volume of soil and subsoil will be excavated and removed to allow for infrastructure works to take place in comparison to the total volume of these materials present on the site;
- In order to minimise erosion during the construction phase, works will not take place during periods of intense or prolonged rainfall (to prevent increased silt laden runoff);
- At the identified spoil deposition areas, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated;
- The spoil deposition areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil is being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil deposition area until the area is full;
- The placement of spoil will be restricted to a maximum height of 2m, subject to confirmation by the Geotechnical Clerk of Works;
- Where practical, the surface of the placed spoil is shaped to allow efficient runoff of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil;
- Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 2
 (h) in the deposition areas and not greater than 1 (v): 1 (h) alongside access tracks;
- Inspections of the spoil deposition areas will be made by the Geotechnical Clerk of Works on a weekly basis during the construction phase and monthly for a 6month period thereafter. The appointed contractor will review work practices at the spoil deposition areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated;



- An interceptor drain will be installed upslope of the spoil deposition areas to divert any surface water away from these areas;
- Silt fences and double silt-fences will be emplaced down-gradient of spoil deposition areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level;
- The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Clerk of Works and vegetated or allowed to vegetate naturally;
- All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Clerk of Works prior to construction; and,
- Spoil deposition areas are at a minimal distance from excavation areas to avoid excessive transport of excavated materials.

Mitigation measures along the underground electricity line include:-

- Soils and subsoils excavated along the underground electricity line will be immediately removed from site to a licensed waste management facility or temporarily stored in covered stock piles along the edge of the road carriageway for removal;
- Some spoil material will be transported and stored at the designated spoil management areas at the electricity substation site;
- All material generated from the excavation of the underground electricity line trench located within the public road corridor will be disposed of in a nearby licensed waste facility to prevent a risk of soil contamination from road structure material (i.e. tarmacadam); and,
- The tarmacadam road surface will be replaced with the same design standard as the surrounding carriageway.

4.4.2 Erosion of Exposed Soil and Subsoil

The following mitigation measures are proposed to prevent the erosion of soil and subsoil at the electricity substation site:-

- Soils and subsoils excavated will be reinstated within the electricity substation site;
- The upper vegetative topsoil layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored spoil within the deposition areas;
- Re-seeding and spreading/planting will also be carried out in the spoil deposition areas;
- Temporary drainage systems will limit runoff impacts during the construction phase; and,
- A detailed Spoil Management Plan will be prepared as part of the Construction & Environmental Management Plan prior to the commencement of development.

The following mitigation measures are proposed to prevent the erosion of soil and subsoil along the underground electricity line:-

- Soil/subsoil removed from the trench will be immediately removed from site to a licensed waste management facility to prevent erosion or temporarily stored in covered stock piles along the edge of the road carriageway for removal;
- Temporary drainage systems will limit runoff impacts during the construction phase; and,



• The underground electricity line will be constructed in a stepwise manner along its length. This will minimise the time any particular section of the underground electricity line trench is open before being reinstated.

4.4.3 Contamination of Soils and Subsoils by leakages, spillages of hydrocarbons or other chemicals

The following measures are proposed to specifically prevent contamination of soils and subsoils:-

- The volume of fuels or oils stored on site will be minimised;
- All fuel and oil will be stored in an appropriately bunded area of sufficient capacity within the temporary construction compound. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor;
- All bunded areas will have 110% capacity of the volume to be stored;
- An oil interceptor will be installed within the surface water drainage system at the electricity substation site during the construction phase to intercept any accidental hydrocarbon spillages;
- From the construction compound, fuel will be transported to the works area by a 4x4, in a double skinned fuel bowser. The fuel bowser, a double-axel custombuilt refuelling trailer will be re-filled at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. The bowser/4x4 jeep will also be fully stocked with fuel absorbent material, pads and spill kits in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with any accidental spillages within the temporary construction compound and during re-fuelling;
- All waste tar material arising from road cuttings (from trenching in public roads) will be removed off-site and disposed of at a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works; and,
- An emergency plan for the construction phase to deal with accidental spillages is enclosed at **Annex 1**. This emergency plan will be further developed by the contractor prior to the commencement of construction.

4.4.4 Ground Instability and Failure

The following measures, which will be implemented during the construction phase of the project, will assist in the management of the geotechnical risks for this site:-

- Appointment of experienced and competent contractors;
- The site will be supervised by experienced and qualified engineering/geotechnical personnel;
- Prevent undercutting of slopes and unsupported excavations;
- Maintain a managed and suitable drainage system;
- Ensure construction method statements are followed or where agreed modified/ developed; and,



• Prepare, revise and amend a Geotechnical Risk Register as construction progresses.

4.5 Water

4.5.1 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

4.5.1.1 Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only present during certain months of the year, and does not exist between ~May–November, thus construction proposed between May-November will not affect the turlough.

The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

4.5.1.2 Mitigation by Design

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.

Management of surface water runoff and subsequent treatment prior to release offsite will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed downgradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;
- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;
- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;



- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change
- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

<u>Silt Fences</u>

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

<u>Silt Bags</u>

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works

Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in



drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Weather monitoring is a key input to the successful management of the drainage and treatment system during the construction of the substation. This, at a minimum, will involve 24-hour advance meteorological forecasting linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 5-year storm event), planned responses should be undertaken. These responses will involve control measures including the cessation of construction until the storm event has passed over and flood flows have subsided. Dedicated construction personnel should be assigned to monitor the weather.

<u>Monitoring</u>

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

Settlement ponds will require inspected and cleaning when necessary. This will be carried out under low or no flow conditions so as not to contaminate the clean effluent from the pond. The water level would first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment would then be removed by a mechanical excavator and disposed of in areas designated for the deposition of spoil.

4.5.1.3 Underground Electricity Line

No in-stream works are required at the crossing location. Mitigation measures which are outlined above will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse.

Furthermore, working near watercourses along the underground electricity line during or after intense or prolonged rainfall events will be avoided.

4.5.2 Groundwater Flows and Levels due to Alteration of Recharge Rates

Due to the characteristics of the project, no mitigation measures are required in relation to the maintenance of recharge rates.

4.5.3 Groundwater Levels due to Excavation Works

Due to the characteristics of the project and the receiving environment, it is assessed that no mitigation measures are necessary regarding groundwater levels.

Given the shallow depth of the underground electricity line, it is assessed that no mitigation measures are required regarding groundwater levels.



4.5.4 Surface Watercourses

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment.

4.5.5 Accidental Release of Hydrocarbons

Mitigation measures to avoid the release of hydrocarbons at the project site are as follows:

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;
- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,

An emergency plan for the construction phase to deal with accidental spillages is enclosed at **Annex 1**. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

4.5.6 Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,

No water will be sourced on the site, nor will any wastewater be discharged to the site.

4.5.7 Release of Cement-Based Products

4.5.7.1 Mitigation by Avoidance

The following mitigation measures are proposed:-



- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

4.5.7.2 Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);
- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

4.5.8 Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;



- There will be no storage of material/equipment or overnight parking of machinery inside a 15m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-



- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

4.5.9 Karst Features

The following mitigation measures are proposed:-

- Site drainage management will be put in place in order to prevent any poor quality drainage water reaching the turlough during the construction phase. This includes 3 no. layers of silt fencing downgradient of works areas, as well as the general separation of clean and dirty water, while maintaining the overall hydrological regime of rainfall recharge to ground; and,
- Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed above, will provide a high level of protection to groundwater and surface water quality and ensure that groundwater quality and karst features will not be significantly affected, thus protecting the groundwater quality of the Karstic Bedrock Aquifer.

4.5.10 WFD Status

Strict mitigation measures in relation to the protection of surface and groundwaters are outlined above. The implementation of these mitigation measures during the construction phase of the project will ensure the qualitative and quantitative status of the receiving groundwaters and surface waters will not be altered by the project.

4.5.11 Designated Sites

Mitigation measures have been outlined above which will ensure the protection of groundwater quality and quantity leaving the project site. These mitigation measures include:-

- Site specific drainage design ensuring all water recharges to ground and mimics the existing hydrological regime;
- Protection of groundwater from cement-based materials; and,
- Protection of groundwater from the potential release of silt and hydrocarbons.

Furthermore, mitigation for the protection of surface water quality along the underground electricity line associated with the directional drilling is detailed at **Section 4.5.8**.



4.5.12 Groundwater Supplies

Mitigation measures have been outlined above which will ensure the protection of groundwater quality and quantity leaving the project site. These mitigation measures include:-

- Site specific drainage design ensuring all water recharges to ground and mimics the existing hydrological regime;
- Protection of groundwater from cement-based materials; and,
- Protection of groundwater from the potential release of silt and hydrocarbons.

4.6 Air Quality & Climate

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of an outline Dust Minimisation Plan. A detailed Dust Minimisation Plan will be formulated prior to the construction phase of the project, and will include the following measures:-

- The on-site access track and public roads in the vicinity of the project site shall be regularly cleaned to remove mud, aggregates and debris and maintained as appropriate. All road sweepers shall be water assisted;
- If the access track has the potential to give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions;
- In the event of dust nuisance occurring outside the site boundary, movement of materials will be immediately terminated, and satisfactory procedures implemented to rectify the problem before the resumption of operations;
- If issues persist and the above measures are not satisfactorily controlling dust emissions, a wheel washing system with rumble grids to dislodge accumulated dust and mud prior to leaving the site should be installed;
- During movement of materials off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and,
- The Dust Minimisation Plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

4.7 Landscape

Aside from standard construction stage measures to minimise land and vegetation disturbance (such as delineating the works area) and dust emissions (through damping down of access tracks if necessary), no specific landscape and visual mitigation measures are to be implemented. The appropriate management and reinstatement of excavations promptly will ensure that any adverse effects caused, for example, at the site entrance or along the route of the underground electricity line, are minimised insofar as possible.



Similarly, the progressive reinstatement and landscaping of the site will remediate any short-term adverse effects on the local landscape. As part of the reinstatement and landscaping process, the planting of hedgerows will also be completed at the electricity substation site entrance.

4.8 Cultural Heritage

Archaeological, architectural and cultural heritage resources will be protected through the following mitigation and monitoring measures:-

- Archaeological monitoring of all excavations associated with construction of the electricity substation shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring;
- Archaeological monitoring of all excavations associated with construction of the underground electricity line shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring;
- Archaeological monitoring of all excavations at townland and parish boundaries shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring; and,
- Written and photographic records will be created of any townland and parish boundaries that may be impacted on. The written and photographic records will be created in advance of excavations commencing on site.

Given its proximity to a Recorded Monument (standing stone, which no longer survives above-ground), it is recommended that the micrositing of infrastructure should not be considered at the site of the electricity substation should it result in infrastructure moving closer to the site of the Recorded Monument.

4.9 Noise & Vibration

4.9.1 Noise

The contractors involved in the construction phase will be obliged, under contract, to undertake specific noise abatement measures and comply with the recommendations of BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. The following list of measures will be implemented, as relevant, to ensure compliance with the relevant construction noise criteria:-

- No plant or machinery will be permitted to cause a public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use



and all ancillary pneumatic tools shall be fitted with suitable silencers;

- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, which may be required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen;
- During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed at Chapter 11 of the EIAR using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise; and,
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 07:00 and 19:00 Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays (unless in the event of an emergency), with no operations on Sundays or public holidays.

Based on assessment of the geological composition of the site, it is concluded that rock-breaking will not be required. In the unlikely event that rock breaking is necessary, the following measures will be implemented to mitigate noise emissions:-

- Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency;
- Ensure all air lines are sealed;
- Use a dampened breaking bit to eliminate a 'ringing' sound; and,
- Erect an acoustic screen around breaking activities. Where possible, line of sight between top of machine and reception point should be obscured.

4.9.2 Vibration

Vibration from construction activities shall be limited to the values set out at **Chapter** 11 of the EIAR. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage these limits may need to be reduced by up to 50%.

Given the substantial distances between locations where vibration may be generated and the nearest sensitive locations, no significant effect is likely to be experienced. Therefore, no mitigation measures are proposed.

4.10 Transport & Access

In order to ensure the avoidance of significant effects and reduce the predicted magnitude of effects to the greatest possible extent, a suite of mitigation measures are available which will reduce any likely effects during the construction phase. The following mitigation measures will be implemented:-

• A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Planning Authority prior to the commencement of development. The Traffic Management Plan shall include inter alia confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;



- Appropriate traffic management; including maintenance of local access and pedestrian access (where safe to do so); shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan;
- Construction phase traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00-13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours, for example in the event of an emergency, which would necessitate traffic movements. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- Due to the transient nature of the underground electricity line works, rolling road closures will be implemented. Traffic restrictions shall be kept to minimum duration and extent;
- All reasonable steps shall be taken to ensure that national and regional routes are used to transport all materials to the site, insofar as is possible;
- Prior to, and post, construction; pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures. Following the completion of the preconstruction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken, while any deterioration of carriageways or structures identified in the postconstruction survey shall be put right at the expense of the developer and to the satisfaction of the relevant local authority;
- Appropriate and adequate signage shall be provided at all entrances providing access, safety and warning information;
- At the site entrance leading to the electricity substation, roadside hedgerows shall be trimmed prior to the commencement of construction to ensure that visibility splays are provided in advance of the delivery of construction materials;
- Sufficient car parking spaces will be available at the temporary construction compound during the construction phase. Additionally, during construction of the underground electricity line, it is likely that agricultural premises will be used for the temporary storage of materials (e.g. ducting, cabling, etc.) and for the parking of construction plant, machinery, and work vehicles (cars, vans, etc.). No parking of cars by persons associated with the project will be permitted on any part of the public road that is not closed to traffic. All staff will be instructed to ensure that private entrances remain unobscured (particularly along the electricity line route);
- A dry wheel washing facility will be provided, as necessary, to prevent any debris being transferred from electricity substation site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the project site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;
- All works within the public road corridor (i.e. underground electricity line) shall be undertaken in consultation with, and agreed in advance with, the relevant local authority and only following receipt of all necessary licences, permits and consents;



- Where possible, joint bays will be installed within roadside verges or at field entrances;
- Road sweeping, particularly along the underground electricity line route, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions;
- Speed limit compliance will be emphasised to all staff and contractors prior to the commencement of construction during site induction, and will be strictly enforced throughout the construction phase;
- Following the installation of the electricity line ducting, the trench will be backfilled with appropriate material and temporarily reinstated. Following the installation of the underground electricity line, all public roads within which it is proposed to install the underground electricity line will be subject to a full-width carriageway reinstatement (re-surfacing) of the relevant road section. Road reinstatement specifications and methodologies will be agreed with Roscommon County Council prior to the commencement of development and as part of the road opening licencing process;
- Maximum axle loadings shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);
- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and Roscommon County Council; and,
- The electricity substation site and active underground electricity line works area shall be closed, and strictly secured, to the public during the construction phase.

4.11 Waste Management

The contractor shall ensure that all waste generated at the project site is managed in an appropriate manner. The precise methods to be implemented are detailed in the accompanying Waste Management Plan (see **Annex 2**) which shall ensure that waste is managed in accordance with all relevant legislation, best practice methods, and in accordance with the waste management priority hierarchy.

Excavated spoil material, which also constitutes 'waste', shall be managed in accordance with the provisions of the accompanying Spoil Management Plan (**Annex 3**; prepared by MWP Engineering & Environmental Consultants). Only material which cannot be re-used for reinstatement or landscaping shall be removed from the project site and disposed of at an approved waste management facility.

5.0 Implementation of Environmental Management Measures

In the first instance, the construction phase of the project shall be undertaken in strict compliance with all measures set out in the EIAR and NIS; unless where revised or where required to be revised in order to ensure compliance which a condition of planning consent. All relevant conditions of consent shall be inserted at **Table 1** below.

Planning Conditions			
Condition No.	Content	Relevance to Construction Phase (Yes/No)	



Table 1: Planning Conditions

This CEMP; which will be further developed prior to the commencement of construction; all associated documentation, construction management plans, and construction method statements shall be prepared to ensure strict accordance with each of the measures of the EIAR, NIS, and conditions of consent. As stated at **Section 1.4** above, it will be the responsibility of the EM to ensure coordination between this CEMP, all associated construction management plans & method statements, and the requirements set out in relation to the project.

6.0 Communication Plan

Given the multitude of stakeholders to be involved in the construction phase of the project, a clear and concise communications plan will be implemented to ensure that all matters arising are appropriately reported and recorded. The Communications Plan, which will be developed by the contractor, will include a reporting strategy including, but not limited to, the following personnel:-

- Energia Renewables ROI Limited Project Manager;
- Contractor Project Manager;
- Energia Renewables ROI Limited Project Supervisor Construction Phase (PSCS);
- Contractor Site Foreman;
- Environmental Manager;
- Ecological Clerk of Works;
- Geotechnical Clerk of Works; and,
- Archaeological Clerk of Works.

Additionally, Energia Renewables ROI Limited shall appoint a dedicated Community Liaison Officer (CLO) who shall be responsible for engaging with members of the local community regarding the provision of project updates, etc., and shall also be responsible for relaying any matters raised to the project team.

A list of project contacts, to be developed prior to the commencement of construction and included within the detailed CEMP, shall be made available to all construction staff while a copy shall also be provided at the site offices.

7.0 Staff Training & Environmental Awareness

Only staff who have received appropriate training and have the necessary safety training/certification shall be permitted on-site.

All construction phase personnel will receive environmental awareness information as part of their initial site induction. The extent of their induction shall be tailored to the scope of their work; however, as a minimum, all environmental protection matters will be addressed in full. This will ensure that staff are familiar with environmental obligations associated with the construction process and the procedures and measures to be implemented. Staff will also be advised of the likely effects of any noncompliance with the relevant environmental measure.

As described at **Section 1.4**, the EM shall provide regular environmental updates to personnel and shall advise of any improvements which can be implemented.

Tool box talks will be held by the EM, or other relevant personnel at the commencement of each day or at the commencement of new activities. The aims of the tool box talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements will be identified and discussed. Additionally, any non-compliance with a measures in this



CEMP will also be discussed with the aim of avoiding a re-occurrence of the same non-compliance.

8.0 Emergency Response Procedures

Prior to the commencement of construction, the contractor shall prepare a comprehensive emergency response procedure to be implemented by on-site personnel. This on-site procedure shall be incorporated within the Environmental & Emergency Response Plan (**Annex 1**) to ensure that appropriate procedures are in place to manage any incident and report same to the relevant stakeholders.

9.0 Recording & Reporting

Over the course of the construction phase, a significant volume of reporting will be undertaken to record the activities, methodologies, and measures implemented during the construction phase. With regards to environmental recording, the following is a non-exhaustive list of reports/records which are likely to be appended to the CEMP as the construction phase progresses:-

- Site Sign-In Records;
- Weekly Environmental Reports;
- Monthly Environmental Reports;
- Site Visual Inspection Checklists;
- Environmental Audits;
- Ecological Survey Reports;
- Water Quality Monitoring Reports;
- Archaeological Monitoring Reports;
- Geotechnical Monitoring Reports;
- Traffic Management Plans;
- Waste management documentation;
- All relevant licences, consents, and permits;
- All correspondence (internal and external) regarding environmental matters; and,
- Staff Training Records.

10.0 Compliance & Review Procedures

10.1 Site Inspections & Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Contractor Project Manager, PSCS, Contractor Site Foreman, EM, and ECoW to ensure all environmental controls, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in accordance with this CEMP and all other relevant documentation.

10.2 Auditing

The contractor will be responsible for ensuring that all construction staff are aware of the requirement to, and understand the importance of, strictly implementing the procedures of the CEMP. Environmental audits will be undertaken during the construction phase of the project. In contrast to monitoring and inspection activities, audits are designed to identify the underlying causes of non-compliances and not to merely detect the non-compliance itself.



Moreover, audits are the means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the contractor or by external personnel acting on their behalf. The impartiality and objectivity of the audit process is crucial in the identification of improvements to the activities being undertaken at the project site. Environmental audits will be scheduled and conducted at regular intervals to determine whether the CEMP is being appropriately implemented. The findings of the audits will be provided to the Energia Renewables ROI Limited Project Manager, Contractor Project Manager, PSCS, EM, and ECoW.

A sample Environmental Audit is included at **Annex 1**.

10.3 Environmental Compliance

As has been set out in the preceding sections, construction activities will be continuously and rigorously assessed to ensure that works are undertaken in accordance with the provisions of the detailed CEMP (to be prepared prior to construction). Where an environmental 'event/occurrence' has been identified, the following definitions shall apply:-

- Near-Miss: An event which has not resulted in an adverse environmental effect but which, if not addressed, could re-occur and result in adverse effects;
- Incident: An event which has occurred and which, if un-controlled, could result in substantial effects; however, on-site measures/procedures avoided such effects;
- Exceedance Event: Where an event has resulted in identifiable adverse effects which exceed the appropriate limit value (e.g. a deterioration of downstream water quality below acceptable limits). An exceedance event usually triggers the cessation of particular activities until an investigation has been completed and additional measures implemented; and,
- Non-Compliance: The identification of an un-agreed deviation from prescribed procedures/measures set out in this CEMP.

10.4 Corrective Actions

A corrective action relates to the implementation of revised measures/procedures to rectify an identified environmental matter/concern/issue. Corrective actions will be implemented by the Contractor Project Manager, as advised by the PSCS and EM,

Corrective actions may be required as a consequence of:-

- Environmental Audits;
- Environmental Inspections; Environmental Monitoring;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required. A Corrective Action Notice will describe the cause and effect of the environmental issue/concern and will detail the recommended corrective action to be implemented.

If an environmental matter/concern/issue arises which requires immediate intervention; direct communications between the Contractor Project Manager, PSCS and EM will be conducted. A Corrective Action Notice will be completed subsequently.

Annex 1 – Environmental & Emergency Response Plan





Moyvannan Electricity Substation

Planning-Stage Construction & Environmental Management Plan

Environmental & Emergency Response Plan

Energia Renewables ROI Limited

Galetech Energy Services Clondargan, Stradone, Co. Cavan Ireland Telephone +353 (0)49 555 5050 www.galetechenergyservices.com



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1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Environmental and Emergency Response Plan (EERP) which should be instigated if an emergency or environmental incident occurs either within the project site or elsewhere linked to the construction of the project.

1.1 Purpose of this Report

Many construction and industrial sites have the potential to cause environmental harm which could pose threat to public health, water supplies and wildlife in the event of an environmental incident. The purpose of this report is to outline how, in the event of an emergency, impacts on humans and the local environment can be limited through quick action.

This EERP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every contractor or sub-contractor at the site.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction & Environmental Management Plan (CEMP) for the Moyvannan Electricity Substation. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

It contains details of:-

- Who should be contacted in an emergency;
- Procedures to be followed in an emergency; and
- Staff responsibilities in an emergency.

1.2 Environmental Incident

This EERP should be implemented once there has been an emergency or environmental incident on site or elsewhere linked to the construction of the Moyvannan Electricity Substation. Incidents can be a discharge to air, land or water that could cause environmental damage. Causes of environmental incidents on site include:-

- Land Slide;
- Vandalism;
- Fire;
- Leaking plant or equipment;
- Containment Failure;
- Overfilling of containment vessels;
- Discharge of raw or partially treated effluent;
- Wind-blown waste, litter or dust;
- Flooding on site;
- Leaking Portaloo;
- Fuel drips or spills during refuelling;
- Leak from fuel or chemical containers;
- Failure of pumps and pipelines; and
- Contaminated water or sediment/silt entering a waster course or drain.

Any of these incidents could affect drainage systems, surface waters, ecosystems, groundwater and soil. The production of toxic fumes and airborne pollutants could affect air quality which may damage human health, wild and domestic animals and ecosystems.



1.3 Reference Documents

The production of this EERP has been supported by current legislation and will be accounted for in the further development of the appointed contractor's detailed CEMP.

Other guidance documents have been used to develop this EERP; including a Planning-Stage Construction & Environmental Management Plan, Waste Management Plan, Spoil Management Plan and Stormwater Management Plan.

2.0 Requirements of an EERP

This EERP provides guidance for environmental incidents and includes:-

- Summaries of local environmental sensitivities;
- An outline of the construction works and sources to relevant existing environmental plans;
- Key mapping reference points for the site;
- Contact information for key external bodies and emergency response numbers who will assist in the event of an emergency;
- An identification of key staff and 24-hour contact details for those who will assist in the event of an emergency;
- An identification of Inventory of Pollution Prevention Equipment;
- Details of an Inventory of Chemical Products and Waste Inventory on Site*;
- Details of reporting requirements;
- Details of staff who are trained in the use of spill kits and booms etc.;
- Procedures to be followed in the event of an emergency and an identification of those responsible for re-positioning and moving the plant; and
- A widely available summary sheet for operatives that outlines the key procedures in the event of an emergency.

3.0 Description of the Project

Energia Renewables ROI Limited intends to construct the Moyvannan Electricity Substation which will consist of:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the Athlone-Lanesborough overhead transmission line and the provision of 2 no. interface masts;
- Approximately 7.5km of underground electricity line between the electricity substation and the permitted Seven Hills Wind Farm grid connection infrastructure; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The entirety of the project is located within the administrative area of County Roscommon; while electrical equipment suppliers, construction material suppliers and candidate quarries which may supply aggregates are located nationwide.

As well as the reference documents listed in **Section 1.3**, various environmental reports have been prepared for the development including:-

- Environmental Impact Assessment Report (Galetech Energy Services);
- Population & Human Health Chapter (Galetech Energy Services);
- Biodiversity Chapter (SLR Consulting);



- Land & Soil Chapter (Hydro Environmental Services);
- Water Chapter (Hydro Environmental Services);
- Material Assets [Transport & Access] (Galetech Energy Services); and
- Natura Impact Statement (SLR Consulting).

4.0 Incident and Hazard Reporting

To ensure that all environmental incidents or hazards are accurately recorded, a reporting system has been developed. The logging of environmental incident reports will ensure that regular revisions and reviews can be made. In the event of an accident/incident, a blank environmental incident report has been attached on the last page of this report that includes details of all non-compliance and corrective actions carried out as a result of any incidents.

5.0 Waste Disposal after Environmental Incidences

In the event of a pollution incident where a spill kit etc. may be used, operatives must dispose of the used equipment by placing them into a sealed bag or container. Used equipment will then be removed from site by a licensed waste contractor to a licensed waste facility.

6.0 Site Induction and Toolbox Talks

It is crucial that all contractors, sub-contractors and staff on site are fully familiar with this EERP. Toolbox talks will be regularly given to the workforce on the aspects of health and safety of this project and, during these talks, they will receive regular reminders of the importance of not only the local environment but of the necessary environmental controls that are in place on site.

7.0 Summary Sheet for Machinery & Plant Operators

This summary sheet is for all site personnel. A laminated copy will be kept on all site vehicles/machinery.

7.1 Procedures for an Incident

The following procedures are a guide when dealing with incidents. To ensure health and safety for yourself and others, this health and safety guidance should be followed at all times alongside applying common sense:-

- 1. Identify the source of the spillage and cut off source if possible through closing a valve or righting container etc.;
- 2. Discontinue all work on site and all operatives will assist in placing spill mats correctly on affected area. Immediately contact Site Manager/main contact;
- 3. Identify the spillage route. If spillage is in close proximity to a watercourse (drainage/ditch/river), divert spillage away from the watercourse through the use of absorbent materials from the spill kit;
- 4. If a watercourse is at risk of contamination from suspended solids from a slope failure, do the following:
 - a. Place straws bales wrapped in geotextile or sand/gravel bags with geotextile curtains immediately in the watercourse(s) at regular intervals downstream from the incident. These sand/straw bags and bales will be removed and replaced with stone filters once water quality is stabilized;
 - b. Stone check dams faced with a layer of geotextile will be constructed at critical points along the watercourse; and



- c. Small sumps will be formed intermittently between the check dams to reduce the amount of suspended solids contained in the water;
- 5. If there has been an oil spill in the watercourse, do the following:
 - a. Place flexible absorbent booms across the watercourse, ahead of the contamination within a quiet stretch of water;
 - b. Place absorbent cushions in the water immediately upstream of these booms as well as downstream of the booms; and
 - c. Remove and replace saturated absorbent material as required. Please ensure removed cushions are placed in sealed polythene bags/containers and disposed of by the principal waste contractor;
- 6. Notify all parties in the order listed overleaf. Notification should be made by one member of staff whilst remaining staff present deal with the spill;
- 7. Dig up all contaminated ground as soon as possible. All contaminated materials should be placed in sealed polythene bags/containers and disposed of appropriately by a licensed waste contractor; and
- 8. Complete required record of incident and response into reporting system.

8.0 Communication Plan

A detailed Communication Plan will be provided by the Contactor, in liaison with relevant stakeholders, and will be included in the updated EERP prior to the commencement of construction. An outline Communication Plan is set out below.







8.1 Environmental Response Plan

Incident Response Plan for the Moyvannan Electricity Substation Based on template provided in GPP 21 – Guidance for Pollution Prevention		
Site Address: Moyvannan, Feamore, Lisbaun, Carrownolan, Carrowncloghan, Carrowkeeny, Ardmullan, Curraghboy, Gortnasythe, Derryglad, Eskerbaun, and Brideswell, Co Roscommon	Coordinates: Map references:	
Official Company Address: Energia Renewables ROI Limited, The Generali Building, Blanchardstown Retail Park, Blanchardstown, Dublin 15 D15 Y2TH		
Key Holders for site (Name and Contact numbers):		
Overview of the activities on site: Include number of employees at different times of the day:		
Daylight hours:		
Dusk to Dawn		
Weekend Dusk to Dawn:		
Bank Holidays:		
Description of surrounding area:		
Date and Version of the plan:	Name & position of person responsible for compiling/approving the plan:	
Review date:	Date of next exercise:	
Objectives of the plan:		
List of external organisations consulted in the prep	aration of this plan with contact details:	
Distribution list of who has received this plan and which version: Please note that it is recommended that you review and revise this plan regularly		

8.2 External Contacts

External Contacts		
Contact	Office Hours	Out of Office
Emergency Services (Fire/Garda/Ambulance)	999 or 112	999 or 112
Local Garda Station	Athlone: 090 649 2600	999 or 112
Local Hospital: Roscommon University Hospital	090 662 6200	999 or 112
Environment Section Roscommon County Council Áras an Chontae Roscommon County Roscommon F42 VR98	090 663 7100	
EPA Regional Office The Civic Centre Church Street Athlone County Westmeath N37 P2T5	090 647 5722	
Inland Fisheries Ireland	01 8842600	1890 347 424 (24 hours)
ESB	01 8529534	
Telecommunications – Eircom/Eir	1800 475475	

8.3 Internal Contacts

Internal Contacts		
Names and position of staff authorised and trainers to activate and co-ordinate the plan. Staff to be contacted if needed to move or evacuate the site		
Other Staff:		
Managing Director		
Site Manager		
Environmental Manager		

8.4 Chemical Product & Waste Inventory

Chemical Pr	Chemical Product & Waste Inventory					
Trade name/ substance	Solid/liquid/gas or powder	UN number	Max amount	Location marked on site plan	Type of Containment	Relevant health & Environmental properties

8.5 Pollution Prevention Equipment Inventory

Pollution Prevention Equipment Inventory (On/Off-Site Resources)			
Туре	Location	Amount	Staff contact



8.6 Site Environmental Incident Report Form

Site:		Date:	
Time:		Weather:	
Report By:		Position:	
Energia Renewables ROI Limited personnel present:		Position:	
Contractor personnel present:		Position:	
Description of Incident:			
Date of Report Complet	ion:		

Item Spilled:	
Estimate of Volume of Spillage:	

List of actions followed once incident was noted	Time:	Correc	ctive Actior Action:	ı	Ву:
Who first observed incident?					
First action					
Next action					
Time Pollution Hotline was contacted					
Other					
Item Questio	ns		Yes	No	Corrective Action

Details of Clean-Up contractor or how contamination was removed from site:

Details of how this could be avoided in future:	
Details of review of internal procedures as result of this incident:	



				Action:	By:	
1. Miscellaneous						
1.01	Does the contractor carry out regular internal environment audits on the site? Are recommendations recorded and is corrective action monitored?					
1.02	Have any environment incidents occurred and have these been reported as per on site procedure?					
1.03	Does the site induction contain a section on environmental requirements, including spill procedures, and is this communicated effectively?					
2. Land						
2.01	Are areas of hard standing (excluding bunded and refuelling areas) appropriately drained?					
2.02	Have local roads been inspected and cleaned where necessary?					
2.03	Has all test pitting and soil stripping been monitored by an archaeologist?					
2.04	Have all site clearance works been checked by an ecologist prior to works?					
3. Materials ar	nd Equipment					
3.01	Is there knowledge of the IFI Guidelines on protection of Fisheries During Construction Works in and Adjacent to Waters (2016) and OPW Environmental Guidance: Drainage Maintenance & Construction (2019)					
3.02	Are transformers/generators located in secondary containment bunds?					
3.03	Are all bunds capable of containing 110% of the volume of the largest container?					
3.04	Is refuelling carried out in a designated refuelling bay?					
3.05	Does all site drainage on hard standing drain to an oil interceptor?					
3.06	Is the designated area for oil, fuel and chemical storage appropriately sited (i.e. on hard standing at least 10m from a watercourse)?					



3.07	Are there procedures in place to monitor bund integrity and manage bund rainwater levels? Are these followed and recorded?				
3.08	Is there awareness that oil or residue from contaminated water removed from bunds should be disposed of as special waste and not discharged to land or the water environment? (oil absorbent materials (pads etc.) should be used first)				
3.09	Are all drums and mobile plant (e.g. generators) placed on drip tray more than 10m from any watercourse?				
3.10	Is all plant maintained in a good state of leaks? Are there records of this?				
3.11	Are there adequate spill kits available and stored in close proximity to potential risks?				
3.12	Are all refuelling browsers double skinned, locked when not in use, and in a good state of repair?				
3.13	Is there evidence of unmanaged/unrecorded fuel/oil spillages on site?				
3.14	Are dry or wet wheel washing facilities fully operational and effective?				
3.15	If wet wheel washing facilities are required, are these closed systems with no discharge to the water environment?				
3.16	Are there laboratory certificates (accredited by the Irish National Accreditation Board) to confirm that imported material stone aggregate brought onto site is free from any contamination?				
4. Noise, Dust & Light					
4.01	Are there facilities to dampen stockpiles and site working areas/roads to suppress dust?				
4.02	Are vehicles carrying loose material sheeted at all times?				
4.03	Are construction works, or deliveries of materials to and from the department, audible at noise sensitive premises?				



				1	
4.04	Has all external construction lighting received the approval of the planning authority?				
5. Waste					
5.01	Is the site tidy and free from litter?				
5.02	Is there evidence of waste beyond the site boundary?				
5.03	Is waste segregated and kept securely in containers in clearly designated areas?				
5.04	Does all waste leaving the site have the appropriate duty of care paperwork?				
5.05	Is all waste leaving the site being taken to an appropriately licensed site?				
5.06	Does all special/hazardous waste (e.g. oil contaminated soils, waste oil) have the appropriate Special Waste Consignment Note?				
5.07	ls material re-used/recycled on site where possible?				
5.08	Are waste management practices in line with the site waste management plan?				
5.09	Are relevant Waste Management Exemptions in place for use of waste on site (e.g. use of waste concrete to create foundation sub-base)?				
5.10	Is there any evidence of burning on site?				
5.11	Is there any evidence of unlicensed burial of waste?				
6. Water					
6.01	Do all discharges to land or watercourses have appropriate authorization from Local Authorities/IFI?				
6.02	Do all watercourses engineering (bank protection, crossing etc.) have the appropriate authorization from Local Authorities/ IFI?				
6.03	Do any abstractions from a watercourse or groundwater body have the appropriate authorization from Local Authorities/ IFI?				
6.04	Has confirmation for the SUDS design for access roads been gained from Local Authorities/ IFI?				



6.05	Are cut-off ditches installed on the uphill side of the working area to avoid contaminated surface water run-off?		
6.06	Has vegetation removal/clearance of the site been minimized to avoid unnecessary areas of bare- ground?		
6.07	Is adequate treatment (e.g. settlement tank/lagoons/discharge to land) provided to prevent silt contaminated water entering watercourses and groundwater?		
6.08	Has vegetation removal/clearance of the site been minimized to avoid unnecessary areas of bare- ground?		
6.09	Have buffer-strips been left between working area and watercourses?		
6.10	Is plant operating in the watercourse?		
6.11	Have all culverts been installed at the base of stockpiles situated within close proximity to watercourses?		
6.12	Have silt fences been installed at the base of stockpiles situated within close proximity to watercourses?		
6.13	Are there adequate controls on site construction roads to minimize sediment runoff into watercourses (in particular, are the adequate flow attention measures within surface drain?)		
6.14	Are there any sign of decaying straw bales in watercourses? (this could lead to organic pollution of the watercourse)		
6.15	Are silt traps regularly maintained?		
6.16	Has ease of maintenance been considered in the design of permanent drainage features?		
6.17	Is there evidence of contamination of any watercourse (e.g. with oil, sediment, concrete, waste) in the vicinity of the works?		



				1	
6.18	Is monitoring of potential impacts on watercourses carried out on a regular basis and fully recorded?				
6.19	Are dewatering operations being carried out in such a way to minimize sediment contamination?				
6.20	Is drainage and run off in concrete batching areas adequate?				
6.21	Are adequate pollution prevention measures considered and put in place during concrete pours?				
7. Landscape					
7.01	Have earthworks been designed to promote successful re-instatement of vegetation?				
7.02	Are reinstatement and restoration works being implemented in a timely manner as per the requirements of the Contract?				
8. Ecology					
8.01	Have storage sites (soil, plant etc.) been sited on areas of lower quality habitat where possible?				
8.02	Have buffer zones been constructed and maintained around designated protected species exclusion areas (e.g. red squirrel dreys, water vole habitats, otter holts, badger holts etc.)?				
8.03	Have toolbox talks on the subject of ecology and environmental responsibilities on site been delivered? Have attendance records been maintained for these?				
9. Documentation Check					
9.01	Start-up meeting record				
9.02	Full contacts list in CEMP				
9.03	Induction records				
9.04	Pollution Prevention Measures Register				
9.05	Geotechnical Risk Register				
9.06	Weekly meeting minutes				
9.07	Records of environmental checks and routine monitoring of mitigation measures				



9.08	Water Quality Monitoring Results		
9.09	Safety and Environmental Awareness Reports (SEARs). Filed and entered in database?		
9.10	Safety and Environmental Audit Reports for the site. (If yes, insert date of last audit)		
9.11	Contractor's Environmental Plans (or Construction Method Statements)		

Annex 2 – Waste Management Plan




Moyvannan Electricity Substation

Planning-Stage Construction & Environmental Management Plan

Waste Management Plan

Energia Renewables ROI Limited

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1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Waste Management Plan (WMP) to detail the measures to be implemented for the control, management and monitoring of waste associated with the Moyvannan Electricity Substation.

1.1 Purpose of this Report

The objective of this WMP is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The WMP shall be implemented throughout the construction phase of the development to ensure that:-

- All site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials;
- All waste materials are segregated into different waste factions and stored onsite in a managed and dedicated waste storage area; and
- All waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated waste management regulations.

1.2 Scope & Requirements

This WMP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every contractor or sub-contractor at the site. The contractor will continually oversee changes to this document and will work alongside the Environmental Manager (EM) prior to any work commencing.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction & Environmental Management Plan (CEMP) for the Moyvannan Electricity Substation. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

1.3 Waste Policies & Legislation

The Department of the Communications, Climate Action & Environment published A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025 in 2020. One of its guiding principles is to minimise waste and, therefore, it is key that the development has an efficient waste management plan in place.

The European Union (Waste Directive) (Amendment) Regulations 2016 ('the Regulations') imply a duty on all waste producers to take measures to apply the waste hierarchy priority order. In these Regulations, the 'Act of 1996' refers to the Waste Management Act 1996 (No. 10 of 1996) and 'Principal Regulations' refers to the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011). The 'Waste Directive' refers to Directive 2008/98/EC of the European Parliament.

The Waste Management Priority Hierarchy, which the developer is obligated to apply in the management of waste, is as follows:-





Figure 1: Waste Management Hierarchy

The waste management hierarchy shown above applies to all waste, including hazardous waste. The diagram conveys that above all, the prevention of waste production is the top priority.

The PCB/PCT Directive (Directive 96/59/ EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls) deals with the disposal of certain hazardous chemicals that represent a particular threat to the environment and to human health.

The European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) (Amendment) (No. 2) Regulations 2017 (S.I No. 282 of 2017) shall be adhered to in the case of transportation to and from the site of any dangerous goods.

The contractor, in accordance with the abovementioned Directives, is legally required to:-

- Prevent waste disposal constituting a public nuisance through excessive noise levels or unpleasant odours, or to degrade places of special natural interest;
- Prohibit the dumping or uncontrolled disposal of waste;
- Ensure that the disposal and recovery of waste does not present a risk to water, air, soil, plants and animals;
- Ensure that waste treatment operations are licensed;
- Prepare a Waste Management Plan;
- Require waste collectors to have special authorisation and to keep records; and,
- Ensure that the waste which cannot be prevented or recovered is disposed of without causing environmental pollution.



The EU Integrated Pollution Prevention and Control (IPPC) Directive (Directive 96/61/EC) provides for a permit system for activities including waste management. In adherence with this Directive, the contractor must:-

- Be in possession of a waste permit for waste disposal; and
- Be prepared at all times for inspection regarding monitoring of waste activities.

1.4 Reference Documents

The production of this WMDP has been supported by best practice manuals, including the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of the Environment, Heritage and Local Government, 2006).

Other guidance documents have been used to develop this WMP; including a Planning-Stage Construction & Environmental Management Plan, Spoil Management Plan, Stormwater Management Plan, and Environmental & Emergency Response Plan.

2.0 Requirements of a WMP

There are four stages to be followed in the management of waste:-

- Planning;
- Implementation;
- Monitor; and,
- Review.

2.1 Planning

During the planning/design/development stages of the Moyvannan Electricity Substation, the nature of the site has been accounted for as well as the environmental considerations and the design of the project. Insightful planning at the early stages will help minimise the quantity of waste produced.

2.2 Implementation

The detailed WMP, to be prepared prior to construction, will implement the management of the following:-

- A brief of waste types expected to be produced;
- Estimates of quantum of each type of waste expected to be produced;
- An explanation of how the contractor aims to minimise the different waste types produced prior to any activity that generates this waste; and
- Procedures for identification of the waste management actions proposed for each different waste type, including re-using, recycling, recovery and disposal (as per the waste hierarchy priorities).

All workers will be fully briefed of waste management procedures and aware of their requirements under the WMP. All site visitors will be briefed on appropriate waste storage and disposal units. Littering will not be tolerated and all personnel will have a duty to challenge those who do not comply with WMP procedures.



2.3 Monitoring

2.3.1 Checks and Records

All stores on site of oil, fuel and chemicals should be visually inspected on a regular basis, especially during extreme weather conditions. Visual inspections will reveal evidence of leaks, spills or contamination.

Records of all visual checks must be maintained and be made available upon request for inspection. The topic of waste management will be regularly discussed during team meetings and, as required, waste management practices should be continually revised.

2.3.2 Waste Inventory

A waste inventory should be continually updated and will include a list of all waste materials leaving the site for disposal as well as the name of the appropriately licensed operator and intended disposal facility. A waste inventory will be added to this plan by the contractor.

2.3.3 Monitoring of WMP

The contractor will appoint the EM to implement and monitor the WMP. The WMP should include an inventory of the types of estimates of the waste to be produced on site. The aim will be to keep the volumes of waste produced below the estimates of waste to be produced. The EM will ensure that a waste audit is carried out every 6-months.

2.4 Review

Upon completion of the construction phase, a waste management review will be undertaken. The aim will be to measure compliance with the WMP objectives and to consider lessons learnt. The review will be carried out by the EM in conjunction with the contractor.

3.0 General Waste Management Principles

- All personnel will be made aware of the objectives of this CDWMP and their responsibilities to minimise the generation of waste and, where it arises, to ensure its appropriate management;
- The generation of waste products will be minimised insofar as possible;
- Appropriate management, storage and disposal procedures will prevent pollution in compliance with legislation;
- All waste storage receptacles shall be secured within the development site;
- All waste receptacles shall be maintained in good condition;
- No waste receptacles shall be stored within 10m of any surface water feature;
- For general waste, wheelie bins should be selected or, where required, covered skips should be obtained;
- All waste to be transported off-site shall only be removed by a licenced waste carrier. Local waste carriers and disposal facilities will be selected where possible;
- Maintain appropriate waste records. Such records must detail:-
 - An adequate description of the waste;
 - Where the waste came from;



- The appropriate code from the List of Wastes Regulations for waste (commonly referred to as the EWC code);
- Information on the quantity and nature of the waste and how it is contained;
- Names and addresses of the transferor (the person currently in control of the waste) and the transferee (usually either a registered waste carrier or a waste management license holder (waste manager);
- The Standard Industry Classification (SIC) CODE (2007 or 2003 for hazardous waste only) of the business from where the waste was received;
- Where applicable, indicate that the waste hierarchy has been complied with;
- The place, date and time of transfer of the waste. If using a season ticket, the period for which it is valid (i.e., valid from dd/mm/yyyy to dd/mm/yyyy); and
- If the waste is being taken to landfill the transfer note must also contain details of any treatments or processes that have already been applied;
- Waste records will be stored for a period of 3-years. Where records are provided through an online portal, access to the portal shall be maintained by the relevant contractor;
- Only trained operatives should handle hazardous substances. All stored hazardous waste will be clearly labelled;
- No hazardous waste shall be removed from site in the absence of all appropriate documentation;
- No storage of hydrocarbons or any toxic waste chemicals should occur within 50m of a watercourse/drainage ditch;
- All associated hazardous waste residuals (including used oil spill kits), such as oil, solvents, used absorbent materials on minor oil spills, glue and solvent based paint containers will be stored within appropriately covered skips prior to removal by a suitable local authority or EPA approved waste management contractor for off-site treatment/recycling/disposal;
- Waste storage areas will be clearly located and made known to all operatives;
- Oil waste shall be stored in a double skinned tank. However, if a double skinned tank is not available, the oil waste will be bagged and stored in a secure storage vessel with secondary containment in the form of a drip tray or bund. The oil waste shall then be removed from site by a specialist contractor;
- Oily wastes, such as rags and spill absorption material, shall be placed in a bag and stored within a secure container within secondary containment which is capable of ensuring no spilled or collected oil waste escapes. The oil wastes shall then be removed from site by a specialist contractor;
- Obsolete electronic equipment, e.g., computers and associated accessories shall be labelled as WEEE (waste electrical and electronic equipment) and stored safely for a maximum of 12-months prior to sending for recycling;
- All waste will be transported from the site as soon as practicable to prevent overfilling of waste containers; and,
- Frequency of Checks: the contractor will ensure that all storage facilities are checked on a weekly basis. The checklist for completion is attached below.

Waste Checklist		
Waste area checked	Date Checked	Checked By
General office waste		
Bowser		
Portaloo		
Excavated soil		



Washings	
Concrete	
Oil	
Hazardous Waste	

4.0 Typical Waste Streams

4.1 Waste Inventory

The typical waste arising during the construction of the project is provided below. This inventory will be further expanded upon by the contractor prior to the commencement of construction.

Waste Item	EWC	Disposal Method
Re-use		
Non-contaminated spoil arising from groundworks (e.g., topsoil, subsoil, vegetation, stone aggregates, concrete, etc.)	170107 & 170504	Re-use locally within the site for reinstatement or landscaping
Wood Pallets	150103	Return to supplier
Recyclable		
Aluminium Cans	150104	To recycling centre
Cardboard	150101	To recycling centre
Plastic Cups	200139	To recycling centre
Metals	020110	To appropriate recycling centre
Glass (bottles/containers)	200102	To recycling centre
Packaging (general)	150106	To recycling centre
Paper (general)	200101	To recycling centre
Plastics (general)	150102	To recycling centre
Plastics (bottlers, containers, etc.)	200139	To recycling centre
Polystyrene	200104	To recycling centre
Wood/Timber packaging (e.g., crates)	150103	To recycling centre
Disposal		
Food Waste	200108	Disposal by local contractor
General Waste	200301	Disposal by local contractor
Foul Waste	190805	Collection by specialist contractor
Aerosol Cans	160504	Disposal by local contractor
Diesel (hazardous waste)	130701	Collection by specialist contractor
Greases (hazardous waste)	130899	Collection by specialist contractor
Oily water mix from bunds/sumps (hazardous waste)	130507	Collection by specialist contractor
Insulating Oils with PCB contamination (hazardous waste)	130301	Collection by specialist contractor
Synthetic Oils (hazardous waste)	130310	Collection by specialist contractor



Other Oils (hazardous waste)	130203	Collection by specialist contractor
Oil Drums (hazardous waste)	150110 & 150104	Collection by specialist contractor

4.2 Management of Waste

All waste will be segregated and securely stored at the temporary construction compound, in skips and receptacles, which will be covered to protect the contents from the weather. A licensed operator will collect and transfer the skips/receptacles of both recyclable and non-recyclable wastes as they are filled. Where this is not practicable, or where the quantity of waste is small, the contractor will remove the waste to his yard on a daily basis for onward disposal.

A list of licensed operators will be identified provided below.

Permit Number	Name of Permit Holder	Address of Waste Facility	Type of Waste Permitted

Annex 3 – Spoil Management Plan





SPOIL MANAGEMENT PLAN

MOYVANNAN ELECTRICITY SUBSTATION

ENERGIA RENEWABLES ROI LIMITED

August 2024



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Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
24154	MWP-XX-XX-RP-C-6008	P01	26.07.2024	РС	CMcL	BS	S3
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1. Introduction

Malachy Walsh & Partners Ltd. (MWP) were appointed by Energia Renewables ROI Limited to compile a Spoil Management Plan (SMP) for the Moyvannan Electricity Substation ("The Project") in County Roscommon. The site location is shown in Figure 1-2 & Figure 1-2.

The proposed underground electricity line and 110kV electricity substation is associated with the Seven Hills Wind Farm which was granted planning permission by An Bord Pleanála in November 2023.

The Project is located approximately 8km northwest of Athlone town. For the purposes of this Spoil Management Plan, there are two areas to the site:

- 1. 110kV electricity substation to EirGrid standards located in the townland of Moyvannan, Co. Roscommon.
- 2. 110kV underground electricity line located within in public road corridor.



Figure 1-1 Moyvannan Electricity Substation Location Map





Figure 1-2 Moyvannan Electricity Substation and Electricity Line Location Map



2. Purpose of Spoil Management Plan

The purpose of this Spoil Management Plan is to describe how it is planned to construct the Project in a manner that ensures the landscape is not adversely impacted as a result of the Project and that site management practices are carried out to complete the development safely and in the interest of orderly development.

The plan also sets out a methodology to prevent:

- 1. Soil excavated during the construction phase from being stock-piled in an uncontrolled way on site following the completion of construction works.
- 2. Adverse local effects on sensitive habitats.
- 3. Adverse effects from sediment run-off.

The aim is to construct the Project in a manner that facilitates regeneration of natural habitats at locations affected by construction works and will minimise the damage incurred on sensitive habitats. The stages of the spoil management process comprise:

- 1. Appropriate handling of excavated soil,
- 2. Management of existing habitats,
- 3. Rehabilitation of excavated areas

3. Anticipated Ground Conditions and Anticipated Spoil Types

3.1 Electricity Substation

Ground Investigation Ireland Ltd. (GII) carried out an intrusive ground investigation at the electricity substation site between August and October 2023. This information is presented in their Ground Investigation Report for this scheme (Report Number 12953-06-23 Rev A).

The following sequence of strata was encountered during the site investigation works, and generally comprised of:

- Topsoil.
- Cohesive Deposits.
- Granular Deposits.
- Weathered Bedrock.
- Bedrock.

The level at which bedrock was encountered is deeper than the proposed substation platform/compound level. Therefore, excavations in rock are not anticipated. No peat was encountered in the ground investigation at the substation. Therefore, the anticipated spoil at the substation site is likely to consist of topsoil and glacial deposits only.



3.2 110kV Underground Electricity Line

The online maps provided on the Geological Survey of Ireland (GSI) website were consulted to identify the anticipated ground conditions along the route of the underground electricity line.

It has been noted on Geological Survey of Ireland maps that there is a section of peat mapped along the route at the location indicated in Figure 3-1. The length of the section of electricity line mapped in peat is approximately 700m. All peat underneath the trench will be excavated. Peat probes were completed in the fields adjacent to the road through this area. Peat depths less than 250mm were recorded. The road is raised approximately 1.2m above the surrounding fields in this area, therefore it is likely that the excavation depths will be approximately 1.5m in this area to ensure the electricity line is not sitting on peat.

GPR survey was conducted in April 2024 to further investigate this. This survey has verified that there is natural soil present as close as 0.4m below the road surface but the report produced by Precision Utility Mapping also notes:

"Regarding the presence of Peat, radar results have allowed the identification of natural soil, which is most likely composed mainly of sand, silt, and clay (fine grained material). It should be noted that, GPR images alone cannot guarantee with certainty the origin of the materials being investigated."

A small allowance for peat has been allowed for in the material volume calculations for this scheme based on the peat probes.

Based on the above, the anticipated spoil along the route of the electricity line is likely to consist of pavement material, glacial deposits and possibly a small quantity of peat.



Figure 3-1 Proposed 110kV Grid Route in Public Road in Peat Area



4. Spoil Management Basis Statement

4.1 Excavated Spoil Management

Spoil will invariably be generated during excavations for the access track, electricity substation compound, temporary construction compound, structural foundations and trenching for the electricity line as well as developing silt controls and drainage systems. Minimisation of the production of this spoil is to be treated as a high priority, but it is nevertheless accepted that there will be generation of excess spoil in the form of a mixture of topsoil, mineral soil and glacial till.

4.1.1 Electricity Substation

Two types of soil are generated during excavation in the substation site: glacial soils and topsoil. These spoil types need to be treated separately. Glacial soils and topsoil are to be separated during excavation and these two types of spoil will be disposed of generally as follows:

- Glacial soils will be deposited directly on top of other glacial soils. This will require the removal of topsoil
 where present to facilitate the process. The glacial soils will be either placed permanently in the
 dedicated spoil deposition areas or stockpiled temporarily for reuse in fill areas of the site should soil
 stabilisation be carried out or in the landscaping/reinstatement of the site.
- Topsoil can be disposed of on top of glacial soils or on top of existing topsoil if present. It will be stored separately to the glacial soils for reuse within the scheme.

It is proposed that only material required for landscaping, soils stabilisation or reinstatement will be stockpiled adjacent temporarily. The remainder of the excavated spoil should be transported directly from the excavation for disposal within the proposed deposition areas.

4.1.2 Underground Electricity Line

Three types of soil are generated during excavation of the grid in public road; glacial soils, pavement material and possibly a small quantity of peat. These spoil types will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction of the underground electricity line.



4.2 Permanent Disposal of Excavated Spoil

4.2.1 Electricity Substation

The excavated material from the electricity substation site will either be permanently stored in designated storage areas or reused on site in the reinstatement of the site or in fill areas if soil is stabilised.

Deposition Areas

- The deposition areas will be bunded on all downslope sides to prevent material slippage from the deposition area. All bunds will be of adequate strength to be capable of retaining the spoil stored within each bund.
- Any point source drainage from disposal areas will empty into a series of silt control measures designed in accordance with the surface water management plan.
- Water build-up within deposition areas will not be permitted.
- Desiccation of excavated spoil is to be avoided. Topping of deposition areas with 'scraw' from excavations will reduce the risk of desiccation and enhance the re-vegetation process.
- Glacial soils will be deposited at the base of any disposition area with topsoil deposited as the surface layer.
- Upon completion of each storage area, the surface of the deposited spoil will be profiled to a shallow gradient and vegetated with grass other native vegetation.

The management of excavated material will involve the following:

- Excavated spoil shall be stored separately; this will prevent mixing of materials and facilitate reuse or soil stabilisation afterwards.
- All materials which require storage will be stockpiled at a safe angle specified by a suitably qualified engineer to ensure their stability. Material will be secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system.
- If necessary, mineral soils will be covered while stored to minimise run-off.
- Sediment management systems, such as silt fencing, will be provided around the proposed deposition areas where necessary. Drainage systems will also be utilised in mineral storage areas where necessary.

4.2.2 Underground Electricity Line

Spoil excavated from the electricity line route will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction of the underground electricity line.



4.3 Temporary Storage of Excavated Spoil

No permanent stockpiles will be left on site after the completion of the construction phase works for the electricity substation site and the underground electricity line.

4.3.1 Electricity Substation

Following completion of construction, all remaining stockpiles are to be removed for permanent disposal at the proposed 2 no. deposition areas within the site.

Any materials excavated during the construction phase which are to be used in the site reinstatement and landscaping or soil stabilisation process shall, in the first instance, be stored on site in an environmentally safe manner that will not result in the pollution of waters or the smothering of ecologically sensitive habitats.

The following principles will be adhered to when considering the temporary storage of excavated materials.

- Spoil disposal will take place within close proximity to the point of excavation.
- Preparation of the spoil disposal site will involve the removal of the topsoil which will be maintained for re-use during restoration operations.
- Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1.5m in temporary stockpiles.
- Where glacial spoil is to be temporarily stored adjacent to excavations the existing topsoil layer will first be harvested and stored separately. Upon removal of glacial spoil, the topsoil will be reinstated, and the top mat of vegetation replaced.
- The exact location of each temporary spoil storage area will be confirmed on consultation with the geotechnical engineer.
- Once reinstatement is complete, the disposal sites will be re-vegetated with the "top mat" removed at the commencement of disposal operations.
- Upon commencement of the restoration phase, guidance from a suitably qualified environmental professional will be sought to confirm the methodology and programme.

It is proposed that any temporary onsite stockpiles of soil shall be removed and utilised in the site reinstatement programme to infill any excavated areas which will then be mounded and capped with sod prior to the completion of works.

4.3.2 Underground Electricity Line

Spoil excavated from the route in public roads will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction.

Material excavated from the trenches along the route in the public road will be loaded onto trucks immediately following excavation as much as is reasonably practicable. Temporary stockpiling will be kept to a minimum due to the limited available working space within the works area (which will be subject to traffic management measures). When temporary stockpiling is unavoidable, the material excavated from the trenches and joint bays will be stored adjacent to the trench or joint bay. Temporary stockpiles along the route will be in situ for as minimal amount of time as is reasonably practicable.



4.4 Reinstatement

Reinstatement works will commence at an early stage of construction. Such reinstatement will occur following the completion of individual sections of work, such as the completion of a section of access track. Ongoing restorative programming facilitates the immediate relocation of material from one area under construction to another completed area and in doing so can limit the requirement for temporary storage of material on site.

Areas which could benefit from reinstatement with topsoil include any exposed areas surrounding substation platform/compound excavations, margins of access tracks, temporary compound areas, obsolete drainage channels and any other areas left exposed by the construction works.

Excess stone and spoil which is unsuitable as a vegetation layer shall be placed in the deposition areas. These areas will be covered with topsoil to allow vegetative growth post construction.

The electricity line route will be repaved in accordance with the requirements of the local authority following completion of the installation works.

4.5 Control Measures

The following generalised control measures will be enforced during construction:

- No storage of excavated material other than in areas selected for such activities.
- Temporary storage will be within the development footprint.
- Exclusion zones delineating the working corridor will be installed around all working areas using post and rope fences. No activity will be permitted beyond this fence.
- Minimise length of unsupported excavations.
- Water build up in excavations will be avoided.
- Temporary excavations will not be left unsupported for extended periods.
- Upslope cut-off drains will be installed in advance of construction.
- Existing drainage patterns will be maintained as far as is practicable.
- Deviation from the agreed work methodology must be approved by a suitably qualified environmental professional or site geotechnical engineer.
- Where suitable material is available, it will be used for the immediate backfilling of any excavations.

4.6 Inspection of Earthworks and Stockpiles

Inspections of earthworks and stockpiles is an important requirement of the spoil management plan. Inspections of stockpiles and temporary earthworks shall be carried out on a regular basis. Inspections should take place at least once per week and after periods of rainfall. The visual inspections should include inspection of the following:

- the drainage system around stockpiles and earthworks for signs of excessive sedimentation
- the stockpiles for signs of ponding, cracking, budging or concentrated runoff
- the geometry of the stockpiles for signs of settlement or movement
- the material on the face of the stockpile for signs of loss of fines

Should issues with any of the above be noted, remediation measures may be required. These could include covering the stockpiles, adding silt fences around the stockpiles or reprofiling the stockpiles.



4.7 Role of Environmental Manager

An environmental manager will be appointed for the construction phase of the development. As part of this role, the environmental manager will conduct the following works in relation to spoil management:

- Mark ecological constraints on the working areas and route corridors, in consultation with the Geotechnical/Civil Designer as necessary,
- Agree proposals for temporarily side casting and temporary storage areas as development proceeds,
- Agree methodology for stripping existing vegetation and locations where material is to be deposited,
- Agree timing of restoration and reinstatement,
- Monitor the condition of stockpiles.

Annex 4 – Stormwater Management Plan





STORMWATER MANAGEMENT PLAN

MOYVANNAN ELECTRICITY SUBSTATION

ENERGIA RENEWABLES ROI LIMITED

August 2024



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1. Introduction

Malachy Walsh & Partners Ltd. (MWP) were appointed by Energia Renewables ROI Limited to provide planninglevel engineering services for the civil/structural design of a 110kV electricity substation and 110kV underground electricity line. The project, known as the Moyvannan Electricity Substation is located in Co. Roscommon, approximately 8km northwest of Athlone town. The two primary design areas are:

- 1. 110kV Electricity Substation to EirGrid standards located in the townland of Moyvannan, Co. Roscommon.
- 2. 110kV underground electricity line located within in public road corridor.

This report describes both the construction stage stormwater management plan and the operational stage stormwater management plan. An example maintenance and inspection plan is also provided. The Electricity Substation and grid route are both discussed.

2. Site Description

The electricity substation and electricity line is associated with the Seven Hills Wind Farm which was granted planning permission by An Bord Pleanála in November 2023. The permitted wind farm development is shown below in Figure 2-1. The electricity line and electricity substation are shown in Figure 2-2. The electricity substation drainage and water service layout can be found in Appendix 1.



Figure 2-1 Seven Hills Wind Farm Location Map





Figure 2-2 Moyvannan Electricity Substation Location Map

3. Construction Stage

The proposed site drainage system was designed to ensure that the proposal will not change the existing flow regime across the site, will not deteriorate water quality and will safeguard the existing water quality status of the catchment from runoff.

A fundamental principle of the drainage design is that clean water flowing in the upstream catchment, including overland flow and flow in existing drains, is allowed to bypass the works areas without being contaminated by silt from the works. This will be achieved by intercepting the clean water and conveying it to the downstream side of the works areas either by piping it or diverting it by means of new drains or earth mounds.

This process will cause the normally dispersed flow to be concentrated at specific discharge points downstream of the works. Predominantly, intercepted runoff will be diverted to the nearest existing drain or stream. Where existing drains are not available, dispersed outflow will be used. In order to disperse this flow, each such clean water drain will be terminated in a discharge channel running parallel to the ground contours that will function as a weir to disperse the flow over a wider area of vegetation. An alternative method is to allow the water to discharge through perforated pipes running parallel to the ground contours. Both of these methods will prevent erosion of the ground surface and will attenuate the flow rate to the downstream receiving waters. The specific drainage measures to be used at each location are shown on the drainage drawings included with the EIAR.

Dirty water is generated predominantly during construction. The dirty water is generated through the movement of soil material around the site and the breaking down of the road surface under sustained loading from construction traffic. Silt removal from dirty water runoff will be either by filtration or by means of settlement ponds as described below.

Separating the clean and dirty water will minimise the volume of water requiring treatment. The dirty water from the works areas will be collected in a separate drainage system and treated by removing the suspended solids before exiting the site. Dirty water drains will be provided on both sides of the access track and along the periphery



of the electricity substation compound, spoil deposition areas and the temporary site construction compound. Dirty water drains collect all incident rainwater that falls on the infrastructure.



Figure 3-1 Separation of clean and dirty water drainage on a substation site

The treatment system will consist of a series of settlement ponds at designated locations throughout the site. The outflow from the treatment system will be dispersed over vegetation in the same manner as the clean water dispersion and will become diluted through contact with the clean water runoff in the buffer areas before percolating to the ground.



Figure 3-2 Typical clean and dirty water drainage on a substation site



The clean water interceptor drains are positioned upslope to prevent any mixing of the clean and dirty water. The outflow from these drains is then piped under the access track at suitable intervals and at low points depending on the site topography.

3.1 Karst and Discharge Methodology

The drainage philosophy proposed for the site is that the flow from the impermeable features such as the roof, paved hardstanding, bunds, stabilised soil and plinths would be collected in an independent storm sewer system and attenuated before being discharged at a greenfield runoff rate. This discharge point would be located at a precast concrete headwall within the fill slope for the compound. The discharge would flow over a rip-rap apron to dissipate any energies in the runoff and reduce the velocity before it is discharged over the natural vegetation to minimise the potential for erosion at the discharge point. The provision of sump manholes and petrol interceptors would serve to minimise the potential for sediment to be present in the runoff. The vegetation between the discharge point and the turlough would serve to act as a natural filter to minimise any potential limited sediment further.

3.2 Inspection and Maintenance

The drainage and treatment system for the proposed electricity substation must be managed and monitored at all times and particularly after heavy rainfall events during the construction stage. The drainage and treatment system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to prevent water pollution. An inspection and maintenance program should be designed by the contractor and dedicated construction personnel assigned to manage this program. A checklist of the inspection and maintenance control measures should be developed by the contractor and records kept of inspections and maintenance works. These drainage controls should be kept in place during the operational stage of the electricity substation until the vegetation is re-established.

This checklist would include the following :

- Condition of silt traps and settlement ponds
- Removal of silt from settlement ponds
- Erosion concerns
- Blockages of cross-drains

3.3 Collection

The substation site is away from existing watercourses which leaves minimal risk of siltation of watercourses during the course of the works in this area of the site. Working near watercourses will be required along the electricity line route. No instream works are proposed on mapped watercourse. Working near water courses along the route during or after intense or prolonged rainfall events will be avoided and work will cease entirely near watercourses when it is evident that there is a risk that pollution could occur. All construction method statements will be developed in consultation with Inland Fisheries Ireland and in accordance with the details in the CEMP.



3.4 Treatment

Contaminated runoff can be generated on the site access track, construction compound and substation compound areas and is mainly due to excavation for the infrastructure or movement of delivery vehicles and onsite traffic. Drains carrying construction site runoff will be diverted into settlement ponds that reduce flow velocities, allowing silt to settle and reducing sediment loading. A modular approach has been adopted for the design of the settlement ponds which have been sized to cater for a catchment area of 1,200m² works areas.

The settlement ponds have been designed as a three-stage tiered system and this has been proven to work effectively on construction sites. The three-stage system also facilitates effective cleaning with minimal contamination of water exiting the pond.

The treatment process consists of primary, secondary, and tertiary treatment as follows:

- The *primary treatment* consists of a three-stage settlement pond with an over-topping weir at each stage. The first chamber will remove most of the sediment load, while the remaining two chambers will remove most of the remaining load.
- Before the water is released onto the existing ground surface, it passes through a *secondary treatment* system in the form of a graded gravel filter bed.
- The outflow from each interceptor is dispersed across a wide area of vegetation so that the velocity is minimised, and the vegetation can filter out the residual sediment. This is the final or *tertiary* stage of the treatment process. Existing rills and collector drains within the tertiary treatment area are blocked off to prevent the concentration of the flow.

Each sediment treatment unit has been micro-sited using the contour maps and aerial photos to avail of any locally level areas and to ensure that the outflow is spread over as much vegetation as possible.

Settlement ponds will require inspection and cleaning when necessary. This will be carried out under low or zero flow conditions so as not to contaminate the clean effluent from the pond. The water level would first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment would then be removed by a mechanical excavator and disposed of in areas designated for the deposition of spoil. Settlement ponds will require perimeter fencing and signage to ensure that there are no health and safety risks.

Figure 3-3 shows a well-constructed and maintained tiered settlement pond. This example is in an upland environment with a significant ground surface slope and operates efficiently if it is well maintained.





Figure 3-3 Multi-tiered settlement pond with stone filter

The effluent from each settlement pond will discharge to an open channel, 8 to 10 metres in length, running parallel to the ground contours. This will form a weir that will overflow on its downhill side and disperse the flow across the existing vegetation.

3.5 Attenuation

The creation of impermeable areas within a development site has the effect of increasing rates of runoff into the downstream drainage system and this may increase flood risk and flood severity downstream. This applies particularly to urban areas that drain to closed pipe systems which do not have the capacity to cater to increased hydraulic loads.. The Project is located within a large rural catchment with an open drainage system. The footprint of the impermeable areas and the associated increase in runoff rate is very small in the context of the catchment size and therefore represents a negligible increase in downstream flood risk. However, it is proposed to provide some attenuation in order to limit the flow rate into the construction stage settlement ponds during high-intensity storm events so that they do not become overloaded. This will also attenuate the flow during the operational stage.

During the construction stage, all runoff from the infrastructure areas will be routed through settlement ponds downstream. The outflow from the settlement ponds will be released in a controlled and diffuse manner onto the vegetation. Therefore, the proposal will not increase the magnitude of the hydrograph peak and will not increase flood levels downstream.



3.6 Weather monitoring

Weather monitoring is a key input to the successful management of the drainage and treatment system during the construction of the substation. This, at a minimum, will involve 24-hour advance meteorological forecasting linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 5-year storm event), planned responses should be undertaken. These responses will involve control measures including the cessation of construction until the storm event has passed over and flood flows have subsided. Dedicated construction personnel should be assigned to monitor the weather.

3.7 Water quality control measures

Additional infrastructure and measures used to control water quality are described in the following sub-sections.

3.7.1 Minimise exposed areas

The area of exposed ground shall be kept to a minimum by maintaining where possible existing vegetation that would otherwise be subject to erosion. The clearing of topsoil shall be delayed until just before construction begins rather than stripping the entire site months in advance, particularly during access track construction.

3.7.2 Establish vegetation

Exposed areas of the site will need to be re-vegetated either by natural regeneration or by reseeding. Natural regeneration relies on the colonisation of bare ground by native species from adjacent habitats. For this method, a roughened surface will be provided that can trap seeds and soil to provide initial regeneration areas.

3.7.3 Access track construction and maintenance

On-site experience in substation construction has shown that the single most effective method of reducing the volume of sediment created by construction is the immediate surfacing of all service tracks with high-quality, hard-wearing crushed aggregate graded transversely to one or both sides. In this regard, imported stone shall be provided as a finished surface. This significantly reduces the level of suspended solids in the stormwater runoff.

The access track surface can become contaminated with clay or other silty material during construction. Track cleaning will, therefore, need to be undertaken regularly during wet weather to reduce the volume of sediment runoff to the treatment system. This is normally achieved by scraping the surface with the front bucket of an excavator and disposing of the material at designated locations within the site.

3.7.4 Check dams

Check dams will be placed at regular intervals, based on gradient, along all drains to provide flow attenuation, slow down runoff to promote settlement and reduce scour and erosion. They will be placed at appropriate intervals and heights, depending on the drain gradient, to allow small pools to develop behind them. These will contain a clean 100 mm to 150 mm stone material.



4. Operational Stage

Upon completion of the construction stage, the volume of on-site traffic will be negligible and the particular risk of sediment runoff will be mitigated. The operational stage of the project has a dedicated stormwater system that has been designed to collect stormwater from the substation platform, direct it to the attenuation system and discharge to over land.

4.1 Collection

An additional stormwater piped network will be built during the construction stage and will be used in the operational stage to collect the stormwater from the impermeable areas of the substation site. Runoff from the track and other works areas will continue to be directed to the settlement ponds, which will be left in place after the construction stage. Check dams within the drainage channels will remain in place. The retention of this part of the drainage infrastructure will ensure that runoff continues to be attenuated and dispersed across existing vegetation before recharge into the ground. Inspection and maintenance remain significant and any failures should be quickly identified and repaired to prevent water pollution.

4.2 Hydrocarbon Interceptor

An interceptor is located upstream of the attenuation system that is designed to prevent hydrocarbons, such as petrol and oil, from entering the attenuation system. As stormwater flows through the interceptor, it is directed through a series of chambers that slow the flow, allowing lighter hydrocarbons to rise to the surface while sediment and debris settle to the bottom. During heavy rainfall, the velocity of the stormwater can be high and also carry a significant number of contaminants. Petrol interceptors are designed to provide stormwater settlement, thus providing time for the separation process to effectively isolate harmful hydrocarbons and other pollutants. This controlled storage also helps to regulate the flow of stormwater, preventing sudden surges that could overwhelm the attenuation pond. This ensures that only cleaner water, free from harmful hydrocarbons, enters the attenuation pond, thereby protecting the environment.

4.3 Attenuation System

The attenuation system is designed to attenuate 1/100 year storm event from the impermeable areas of the substation and control stormwater runoff. The attenuation system temporarily stores stormwater and gradually release it into the local drainage system at the rate of the greenfield rates. The attenuation system reduces flooding within the substation and mitigates the risk of downstream flooding. In addition to flood control, attenuation ponds can improve water quality by further allowing sediments and pollutants to settle before the water is discharged.

4.4 Discharge

The discharge from the attenuation pond will be directed away from sensitive areas. The stormwater is discharged to a precast headwall & riprap to ground. The headwall and riprap mitigate environmental damage through erosion to the existing vegetation.

The riprap will be placed after the precast headwall and before the existing ground. The riprap consist of a layer of loose stone or gravel that acts as an energy dissipator, reducing the velocity of the stormwater as it exits the headwall. By spreading out the flow and absorbing its energy, the rip-rap apron minimises erosion and helps to



protect the surrounding landscape. The system manages the stormwater quality & quantity and ensures that stormwater is effectively filtered, safely dispersed, and prevented from causing environmental.



Figure 4-1 Example Overland Flow Headwall and Rip-Rap (From Marshalls.co.uk)


5. Maintenance Plan and Schedule for Storm Drainage Infrastructure

An important element of the stormwater management plan in regular inspection and maintenance. All elements of the drainage system should be inspected following a major storm event. Maintenance should be carrying out in tandem with the specification outlined by the manufacturer of various drainage system products and be conducted to whichever is the most onerous. When carrying out maintenance, it is essential that a record of inspection and maintenance on all elements is kept and updated when required. A proposed template to record the maintenance and inspections conducted on the site can be found in Section 5.5

5.1 Operation & Maintenance requirements for attenuation storage system as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the items in the table below should be carried out.

Maintenance Schedule	Required Action	Typical Frequency
	Inspect and identify areas that are not	Monthly for 3 months.
	operating correctly. Take action where	Yearly thereafter.
	required	
	Remove debris from catchment surface.	Monthly
	(where it may cause risk to	
	performance.)	
	For systems where rainfall infiltrates into	Annually
Regular Maintenance	the tank from above, check surface of	
	filter for blockage by sediment, algae or	
	other matter; remove and replace	
	surface infiltration medium as	
	necessary.	
	Remove sediment from pre-treatment	Annually, or as required
	structures, isolation rows, and/ or	
	internal forebays	
Remedial Maintenance	Repair/rehabilitate inlets, outlet,	As required.
	overflows and vents	
	Inspect/check all inlets, outlets, vents	Annually & following
Monitoring	and overflows to ensure that they are in	large storms
	good condition and operating as	
	designed	
	Survey inside of system for sediment	Every 6 months or as
	build-up and remove if necessary	required.

Table 5-1 Attenuation Storage system Maintenance Schedule

5.2 Operation & Maintenance requirements for silt traps as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 5-2 Silt Trap Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency	
Pouting Maintonance	Inspection	Monthly	
Routine Maintenance	Litter/debris removal	Monthly or as required	
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months	
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required	

5.3 Operation & Maintenance requirements for hydro brakes as per CIRIA C753 - SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Maintenance Schedule	Required Action	Typical Frequency	
	Inspection	Monthly	
Routine Maintenance	Litter/debris removal	Monthly or as required	
Occasional Maintenance	Sediment removal – silt stores	Every 6 months	
	should be emptied		
Remedial Maintenance	Repair (as a result of damage or	amage or As required	
	vandalism)		

Table 5-3 Hydro Brakes Maintenance Schedule

5.4 External drainage system - Drainage adjacent to access track

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 5-4 External Drainage System Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency	
Pouting Maintonance	Inspection	Monthly	
	Litter/debris removal	Monthly or as required	
Occasional Maintenance	Sediment removal – silt stores	es Every 6 months	
	should be emptied		
Remedial Maintenance	Repair (as a result of damage or	As required	
	vandalism)		



5.5 **Proposed Maintenance and Inspection Schedule Record Sheet**

A template for recording maintenance and inspections is provided in Table 5-5

Date	Item Inspected/ Maintained	Inspection/ Maintenance Type	Comment on condition of Item prior to the Works and detail of what works were performed	Inspected/Maintained by:

Table 5-5 Example Maintenance and Inspection Record Sheet

