

TOBIN

Lissinagroagh Wind Farm,
Co. Leitrim
Natura Impact Statement

Ireland
FuturEenergy

BUILT ON KNOWLEDGE

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1. INTRODUCTION

TOBIN was commissioned by FuturEnergy Ireland to prepare a report to inform the Stage 2 Natura Impact Statement (NIS) for Appropriate Assessment (AA) for submission to An Coimisiún Pleanála as part of a planning application for the proposed Lissinagroagh Wind Farm in Co. Leitrim and all associated infrastructure ('the Proposed Project').

1.1 OVERVIEW DESCRIPTION OF THE PROPOSED PROJECT

A detailed description of the Proposed Project is provided in the Appropriate Assessment Screening Report (TOBIN, 2026) Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, see Section 2.3).

The Proposed Project comprises:

- A proposed wind farm comprising fourteen (14) wind turbines and other ancillary infrastructure including access tracks and drainage;
- An on-site 110kV electrical substation and underground Grid Connection Route (GCR), to connect the wind farm to the National Grid at the existing ESNB Srananagh substation in Co. Sligo;
- A proposed Turbine Delivery Route (TDR) comprising accommodations along the public road network between Killybegs, Co. Donegal and the proposed Wind Farm Site to facilitate turbine and construction material delivery.

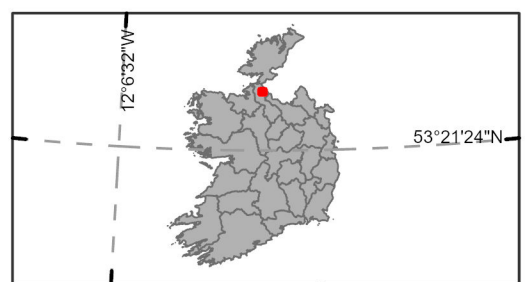
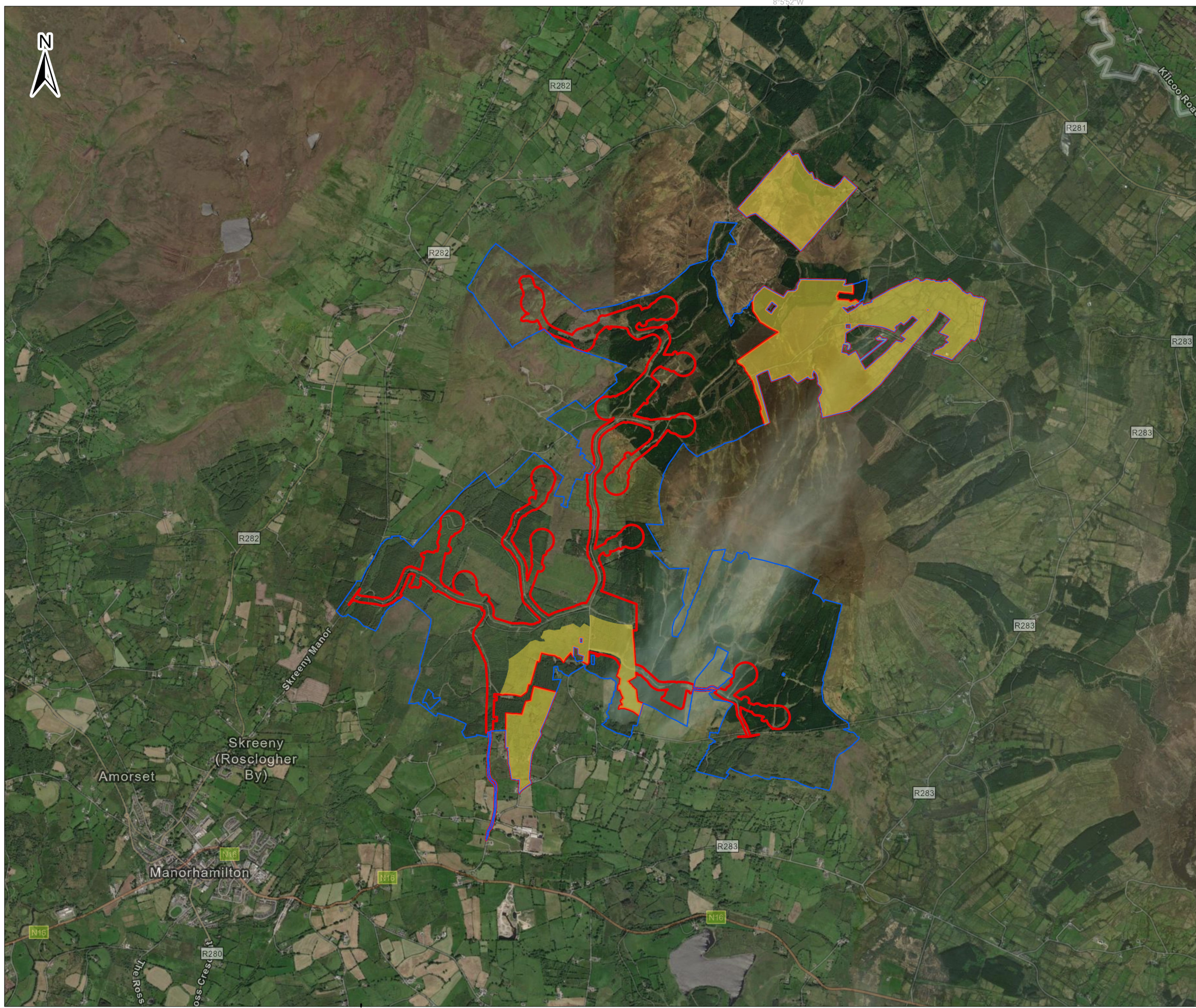
References to the Proposed Project in the EIAR relate to the entire project (i.e. wind farm, on-site substation, GCR, temporary/permanent accommodations along the TDR). The definitions of the following terms will provide clarity throughout the report:

- The proposed Wind Farm Site refers only to the site of the wind farm as delineated by the Red Line Boundary in Figure 1. It does not include the GCR and TDR.
- The proposed Wind Farm Site includes 11 watercourse crossings which will be executed using 10 clear span bridges and one bottomless culvert extension.
- The Survey Area for the proposed Wind Farm Site is delineated by the Blue Line Boundary in Figure 1, and was determined through land ownership folios. It is of relevance to the baseline environment discussed in this chapter.
- The Points of Interest (POIs) along the TDR refers to locations where accommodations are proposed to allow the delivery of oversize loads, such as where vegetation clearance is required, as shown in Figure 2.
- The GCR relates to the route for the proposed underground cable between the onsite substation and the existing Srananagh substation near Sligo, as shown in Figure 3.
- The proposed GCR involves two off-road HDD watercourse crossings.



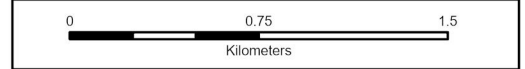
The project design, layout and construction methodologies are presented in full in Appropriate Assessment Screening Report (TOBIN, 2026) Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, see Section 2.5 and 2.6.





Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands



Spatial Reference
 Datum: IRENET95
 EPSG: 2157

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A	19/02/2026	First issue	S.P	S.R

Client: **FuturEnergy Ireland**

Project: **Lissinagroagh Wind Farm**

Title: **Figure 1:
 Proposed Wind Farm Site, Survey Area
 of the proposed Wind Farm Site,
 and Enhancement Lands**

Scale @ A3: 1:30,000

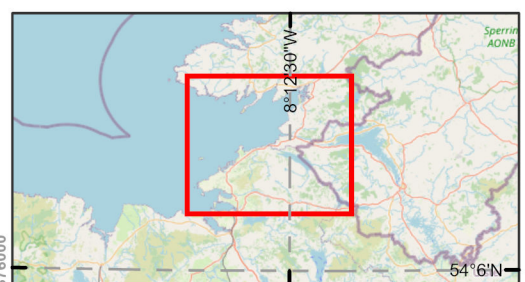
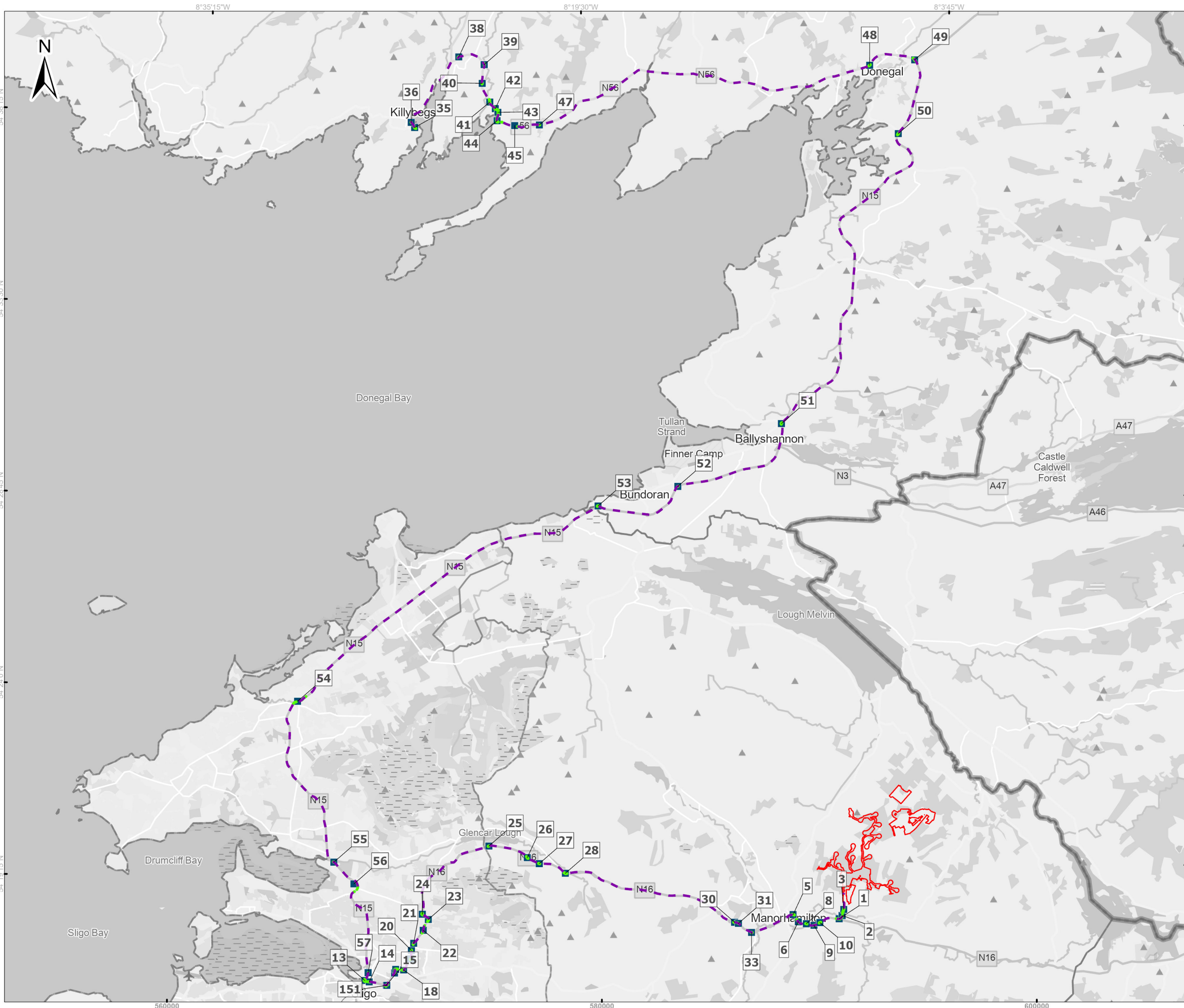
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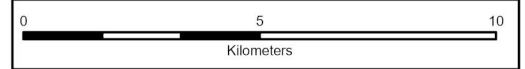
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Legend

- proposed Wind Farm Site
- Turbine Delivery Route
- TDR
- Point of Interest - Locations



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FuturaEnergy Ireland

Project:

Lissinagroagh Wind Farm

Title:

Figure 2:
Turbine Delivery Route from Killybegs,
Co Donegal to the proposed
Wind Farm Site Co. Leitrim

Scale @ A3: 1:160,000

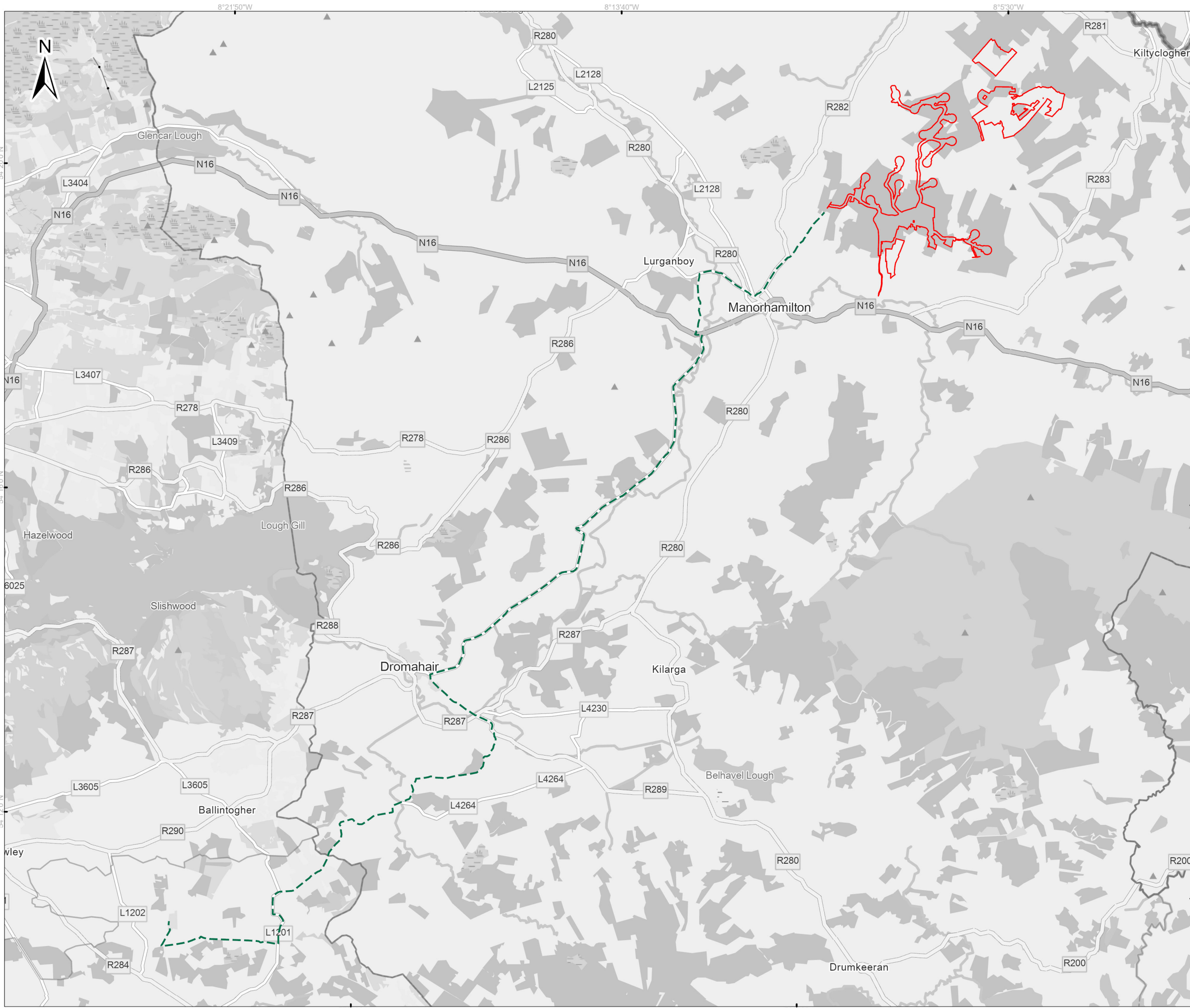
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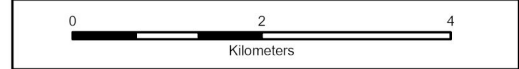
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Legend

- proposed Wind Farm Site
- Grid Connection Route



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Client:

FuturaEnergy Ireland

Project:

Lissinagroagh Wind Farm

Title:

**Figure 3:
 Grid Connection Route from the
 proposed Wind Farm Site Co. Leitrim to
 Sranagh Substation Co. Sligo**

Scale @ A3: 1:80,000

Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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1.2 DESCRIPTION OF THE PROPOSED WIND FARM SITE

A detailed description of the Proposed Project is provided in Appropriate Assessment Screening Report (TOBIN, 2026) Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, see Section 2.3), see Section 2.4 Proposed Project Location.

1.3 PURPOSE OF THIS REPORT

The purpose of this report is to provide supporting information to assist the competent authority, in this case An Coimisiún Pleanála, to carry out an Appropriate Assessment to determine if the Proposed Project is likely to result in adverse effects on the integrity of European sites¹, in view of their conservation objectives, either individually or in-combination with other plans or projects. This Natura Impact Statement should be read in conjunction with the appended Appropriate Assessment Screening Report, which contains a summary of fieldwork undertaken to inform the assessment hereunder (see Section 4 in Appropriate Assessment Screening Report (TOBIN, 2026).

1.4 RELEVANT LEGISLATION

As listed in Section 1.4 of the Appropriate Assessment Screening Report, the main pieces of relevant legislation are as follows:

- The Habitats Directive 92/43/EEC as amended;
- The Birds Directive 2009/147/EC as amended;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended); and,
- Planning and Development Act 2000 (as amended) - PART XAB.

¹ Natura 2000 sites, Special Areas of Conservation and Special Protection Areas, are referred to as European Sites in the [Planning and Development Acts 2000 – 2025](#) and [European Communities \(Birds and Natural Habitats\) Regulations 2011 – 2022 \(Unofficial Consolidation-Updated to 28 July 2022\)](#).



2. METHODS

The approach taken in preparing this document complies with standard methods and best practice guidance, as listed below:

- European Commission (European Commission, 2000). Communication from the Commission on the Precautionary Principle;
- European Commission (European Commission, 2006). Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg;
- European Commission (European Commission, 2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission;
- European Commission (European Commission, 2013) Interpretation Manual of European Union Habitats. Version EUR 28;
- European Commission (European Commission, 2019) Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC;
- European Commission (European Commission, 2021a). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- European Commission (European Commission, 2021b). Guidance document on the strict protection of animal species of Community interest under the Habitats Directive. Publications Office of the European Union, Luxembourg;
- Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government (DoEHLG, 2010);
- Applications for Approval for Local Authority Developments made to An Bord Pleanála under 177AE of the Planning and Development Act, 2000, as amended (Appropriate Assessment) – Guidelines for Local Authorities (An Bord Pleanála, 2013);
- Fossitt (2000). A Guide to Habitats in Ireland. The Heritage Council, Kilkenny; and
- Office of the Planning Regulator (OPR, 2021). Appropriate Assessment Screening for Development Management.

2.1 NATURA IMPACT STATEMENT (NIS)

Section 2 of the Appropriate Assessment Screening report details the methods, definition of relevant terms, Zone of Influence (Zol) of the Proposed Project and consultation responses.

The approach to preparing the NIS is summarised as follows:

- Describe how the Proposed Project will affect the key species and key habitats of the European sites;
- Describe how the integrity of European sites is likely to be affected by the Proposed Project;
- Describe what measures are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of the European sites; and



- Consider findings and determine if potential for adverse effects on European sites remains after such measures have been implemented and in-combination with other plans and projects.

Section 3 of the Appropriate Assessment Screening Report details a description of the Proposed Project.

2.2 PROJECT TEAM

This report was prepared by TOBIN Senior Ecologist Meadhbh Costigan (M.Sc.). Further credentials of TOBIN ecologists and third-party specialists who carried out the field surveys for baseline information are provided in Section 2.3 of the Appropriate Assessment Screening Report (TOBIN, 2026).



3. OVERVIEW OF POTENTIAL LIKELY SIGNIFICANT EFFECTS

Section 7 of the Appropriate Assessment Screening Report summarises the potential for likely significant effects on European sites, in light of conservation objectives. In summary, the potential impacts on SACs and SPAs within the Zol of the Proposed Project consist of:

- Habitat loss;
- Alteration of groundwater flow;
- Contamination of groundwater bodies;
- Sedimentation/contamination of surface waterbodies;
- Disturbance/displacement of QI/SCI species;
- Collision Risk to SCI species from Wind Turbines; and,
- Spread of invasive alien species.

Habitat Loss

The construction phase of the GCR will result in the loss of 10m of Hedgerow (WL1) habitat within the boundaries of Lough Gill SAC to facilitate the proposed temporary launch pit at HDD Site 1. A further 0.01ha of (Mixed) broadleaved woodland (WD1) c. 70m beyond the boundary of Lough Gill SAC in Miltown Forest Recreation Area. This habitat may be of value for commuting and/or resting European otter, which is a QI species for the SAC. As a result, there is potential for likely significant effects on the QI species European otter resulting from habitat loss and associated disturbance/displacement. There will be no further loss of habitat along the GCR during the operation or decommissioning phases.

There is no potential for likely significant effects on the integrity of the SAC as a result of the direct loss of habitat (c. 17m of hedgerow along the N4) at POI 13 along the TDR, which is partially located within Cummeen Strand/Drumcliff bay SAC.

Alteration of Groundwater Flow

The construction phase of the proposed Wind Farm Site has the potential to impact groundwater flow through dewatering at turbine hardstand locations and borrow pits within karstified aquifers. As such, there is potential for likely significant effects on the following European sites in light of the relevant conservation objectives:

- Arroo Mountain SAC;
- Ben Bulbin, Gleniff and Glenade SAC;
- Glenade Lough SAC;
- Lough Gill SAC.

There is no potential for alteration of groundwater flow during the construction, operation or decommissioning phase of the GCR or TDR.

Contamination of Groundwater

The construction phase of the proposed Wind Farm Site has the potential to impact groundwater due to the presence of karstic features and karstified aquifers in the Survey Area of the proposed Wind Farm site. As such, there is potential for likely significant effects on the following European sites in light of the relevant conservation objectives:

- Arroo Mountain SAC;



- Ben Bulben, Gleniff and Glenade SAC;
- Glenade Lough SAC.

There is no potential for the contamination of groundwater bodies during the construction, operation or decommissioning phase of the GCR or TDR.

Sedimentation/Contamination of Surface Water

The release of sediment laden water or otherwise polluted surface water has the potential to reduce water quality in the watercourses draining the Proposed Project that discharge into the European sites. As such, there is potential for likely significant effects on the following European sites in light of the relevant conservation objectives:

- Ballysadare Bay SAC;
- Ballysadare Bay SPA;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI);
- Unshin River SAC;
- Cummeen Strand SPA;
- Donegal Bay SPA; and,
- Drumcliff Bay SPA.

There is potential for likely significant effects as a result of sedimentation and/or pollution of watercourses during the construction, operational and decommissioning phases of the proposed Wind Farm Site. For the GCR the potential for likely significant effects as a result of sedimentation and/or pollution is limited to the construction phase where trenching is taking place along the public roads network within 50m of watercourses. The proposed vegetation removal at the HDD Site 1 and 2 to accommodate the launch pits is located >50m from all watercourses. As such, there is no potential for likely significant effects associated with siltation/contamination of watercourses as a result of HDD site 1 and 2.

For the TDR the potential for likely significant effects as a result of sedimentation and/or pollution of watercourses is limited to the construction and decommissioning phases.

Disturbance/Displacement of QI/SCI species

The potential for likely significant effects as a result of disturbance/displacement to QI/SCI species is limited to the construction phase along the GCR. For the TDR, the potential for likely significant effects as a result of disturbance/displacement to QI/SCI species is identified during the construction and decommissioning phases. There is no potential for disturbance/displacement of QI/SCI species as a result of the proposed Wind Farm Site during any phase of the Proposed Project. As such, there is potential for likely significant effects on the following European sites in light of the relevant conservation objectives for QI/SCI species:

- Ben Bulben, Gleniff and Glenade SAC;
- Lough Gill SAC;



- Cummeen Strand SPA;
- Donegal Bay SPA; and,
- Drumcliff Bay SPA.

Collision Risk to SCI species from Wind Turbines

Both of the SCI species listed for Lough Derg (Donegal) SPA, Lesser black-backed gull and Herring gull have been observed within the proposed Wind Farm Site. Based on this evidence there is potential for collision risk during the operational phase of the proposed Wind Farm Site.

None of the SCI species listed for the other SPAs assessed above were regularly recorded functionally using the lands within the proposed Wind Farm Site in the last 5 years of survey data. As such, there is no potential for likely significant effects as a result of collision risk for the listed SCI species and the overall integrity of the following SPAs;

- Ballysadare Bay SPA;
- Cummeen Strand SPA;
- Donegal Bay SPA;
- Drumcliff Bay SPA;
- Sligo/Leitrim Uplands SPA; and,
- Pettigoe Plateau SPA NI.

Spread of Invasive Alien Species

There is potential for the spread of invasive alien species within the GCR from proposed works along the GCR, specifically the Third Schedule (S.I. No. 477/2011) as listed species Japanese knotweed, Himalayan balsam, and *Rhododendron ponticum*, as stands of these species have already been identified at several locations along the GCR during field surveys. This constitutes potential for the spread of invasive alien species within Lough Gill SAC. The potential spread of invasive species to Lough Gill SAC is limited to the construction phase where proposed trenching works will take place along the proposed GCR. There is no potential for the spread of invasive species to Lough Gill SAC during the operation or decommissioning phase of the Proposed Project as the grid cable will be left in-situ and as such no further works are scheduled along the GCR.



4. CONCLUSION OF THE APPROPRIATE ASSESSMENT SCREENING REPORT

An Appropriate Assessment Screening Report (TOBIN, 2026) was prepared by TOBIN, on behalf of the applicant. The conclusion of the AA Screening Report is as follows:

“Likely significant effects on the European sites within the Zol of the Proposed Project, individually or in combination with other plans and projects, cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites. This conclusion has been reached without taking any mitigation measures into account. Therefore, it is considered that the Proposed Project should progress to the next stage of the appropriate assessment process to determine if it will adversely affect the integrity of thirteen European sites and to propose mitigation.

We therefore submit that the competent authority, in this case An Coimisiún Pleanála, can determine that an Appropriate Assessment is required for the following European sites:

- *Arroo Mountain SAC;*
- *Ballysadare Bay SAC;*
- *Ballysadare Bay SPA;*
- *Ben Bulbin, Gleniff and Glenade SAC;*
- *Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;*
- *Cummeen Strand SPA;*
- *Donegal Bay SPA;*
- *Drumcliff Bay SPA;*
- *Glenade Lough SAC;*
- *Lough Derg (Donegal) SPA;*
- *Lough Gill SAC;*
- *Lough Melvin SAC;*
- *Lough Melvin SAC (NI); and,*
- *Unshin River SAC.”*



5. NATURA IMPACT STATEMENT

The Natura Impact Statement herein sets out the potential adverse effects of the Proposed Project (either alone or in-combination with other projects or plans) on the integrity of the European sites, which have been 'screened in'. The potential for adverse effects on the integrity of the European sites is determined with respect to the conservation objectives of the sites and to their structure and function. The focus is on demonstrating whether or not, with supporting evidence and proposed mitigation, there will be adverse effects on the integrity of the following European sites, should the Proposed Project proceed:

- Arroo Mountain SAC;
- Ballysadare Bay SAC;
- Ballysadare Bay SPA;
- Ben Bulben, Gleniff and Glenade SAC;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Cummeen Strand SPA;
- Donegal Bay SPA;
- Drumcliff Bay SPA;
- Glenade Lough SAC;
- Lough Derg (Donegal) SPA;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI); and,
- Unshin River SAC.

5.1 ASSESSMENT OF THE EFFECTS OF THE PROJECT ON THE INTEGRITY OF EUROPEAN SITES

5.1.1 Potential for Adverse Effects

The Proposed Project has the potential for adverse effects on QI/SCI species and/or the overall integrity of the following European sites:

- Arroo Mountain SAC;
- Ballysadare Bay SAC;
- Ballysadare Bay SPA;
- Ben Bulben, Gleniff and Glenade SAC;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Cummeen Strand SPA;
- Donegal Bay SPA;
- Drumcliff Bay SPA;
- Glenade Lough SAC;



- Lough Derg (Donegal) SPA;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI); and,
- Unshin River SAC.

The QI/SCI species and habitats likely to be affected in the aforementioned European sites are discussed below. These findings are summarised in tabular format in Appendix A-I, with specific reference to the attributes and targets which define the Conservation Objectives of the listed European sites.

5.1.1.1 *Arroo Mountain SAC*

The construction phase of the proposed Wind Farm Site, specifically the site excavations along the western site entrance towards the nearby substation and construction compound as well as the internal haul roads to T11 and T3, constitute a source of potential contamination of the Glencar and Glenaniff GWBs. As the Glencar and Glenaniff GWBs encompass Arroo Mountain SAC, this constitutes a pathway for potential adverse effects on groundwater dependent receptors within the SAC.

Site excavations will increase the vulnerability of the underlying aquifer to pollution through either a complete loss of overburden where cuttings are into the bedrock or by reducing the overburden depth and thus increasing the vulnerability for contaminated drainage (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4). Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table and the attenuating capacity of the geological deposits through which the water travels (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4).

At T3 the Glenanniff GWB is considered to have extreme vulnerability (Figure 5). Similarly, the Glencar GWB at the western site entrance is considered to have extreme vulnerability (Figure 5). The groundwater vulnerability of the Glencar GWB is considered moderate at T11 and the nearby substation. Groundwater vulnerability at the nearby construction compound is considered low.

Groundwater flow through karst areas is extremely complex and difficult to predict (2004a). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (2004a). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (2004a). This constitutes potential for adverse effects on ground water dependant QI habitats through groundwater contamination associated with site excavation works at T3 and the road cuttings associated with the western site entrance, as well as T11 and the nearby substation and construction compound.

Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.4.5.2). Dewatering to accommodate construction activities at T3 and T11 has potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats.

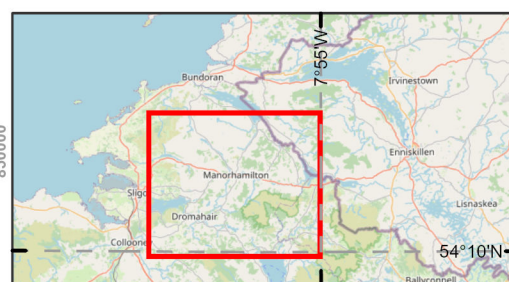
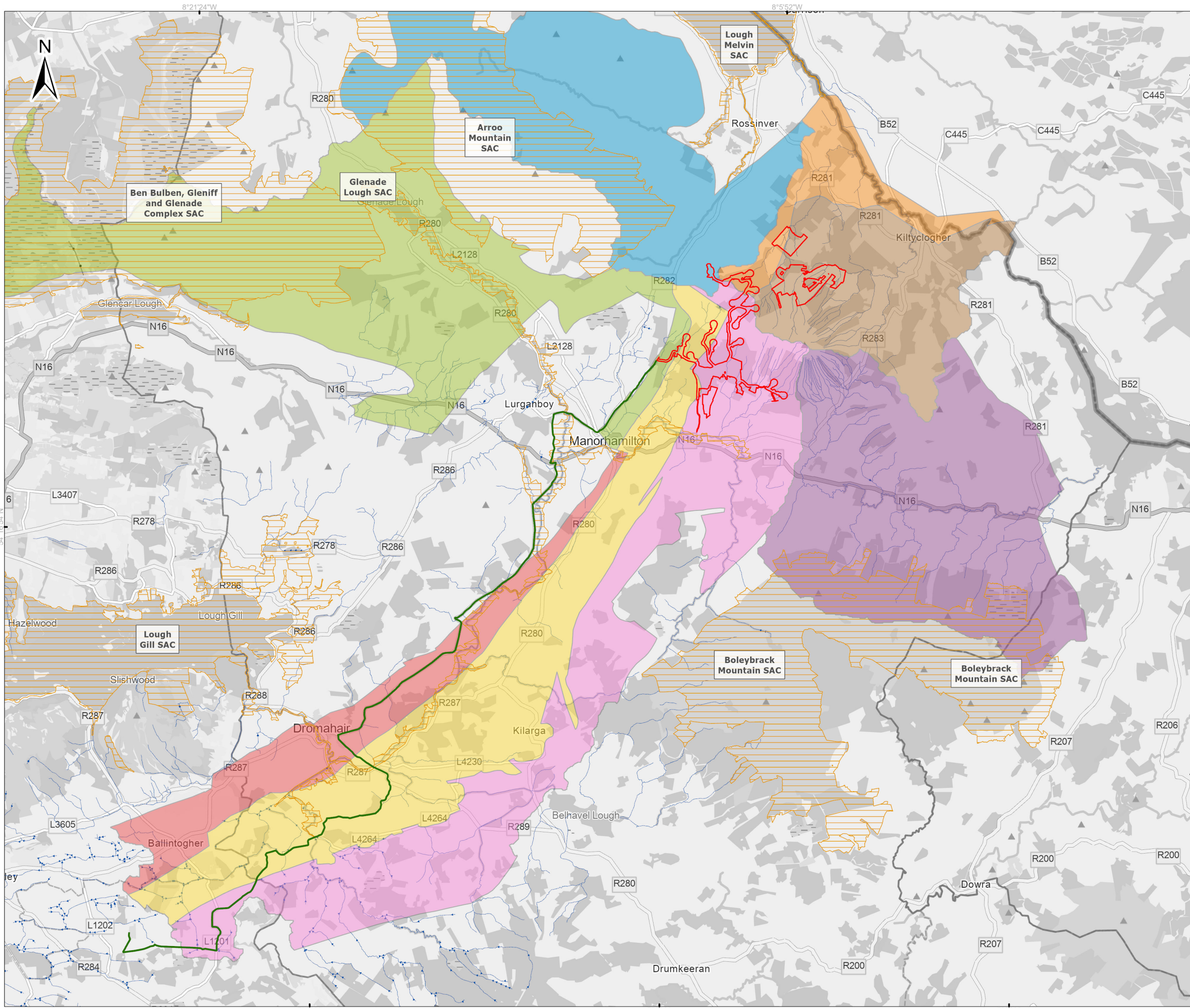


As such, there is potential for adverse effects on the QI habitats for Arroo Mountain SAC which are groundwater dependent during the construction phase, as a result of alterations to groundwater quality and flow, namely (NPWS, 2016c);

- 7220 Petrifying springs with tufa formation (Cratoneurion);
- 4010 Northern Atlantic wet heaths with *Erica tetralix*; and,
- 7130 Blanket bogs (* if active bog).

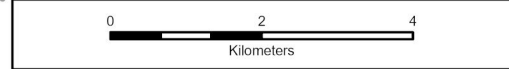
No site excavations or excavation works are scheduled during the operational phase. All roads and turbine hardstands will remain in-situ during the decommissioning phase. As such, there is no potential adverse effects on Arroo Mountain SAC as a result of for groundwater contamination during the operational and decommissioning phases.





Legend

- proposed Wind Farm Site
- Grid Connection Route
- Special Areas of Conservation (SACs)
- WFD - River Water Bodies
- WFD - Groundwater Bodies
- Ballintougher
- Glenaniff
- Glencar
- Glenfarne
- Kilcoo
- Killarga
- Killarga South
- Kiltyclogher



Spatial Reference
 Datum: IRENET95
 EPSG: 2157

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A	19/02/2026	First issue	S.P	S.R
Rev	Date	Description	By	Chkd.

Client: **FuturEnergy Ireland**

Project: **Lissinagroagh Wind Farm**

Title: **Figure 4:
 Survey Area for the
 proposed Wind Farm Site
 with ground water bodies
 and Special Areas of Conservation**

Scale @ A3: 1:100,000

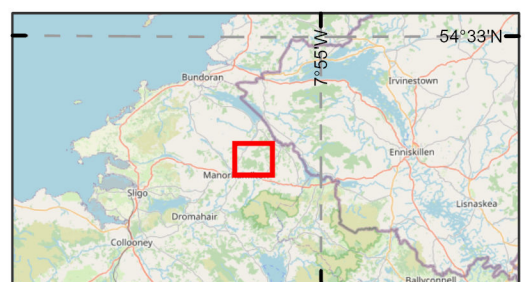
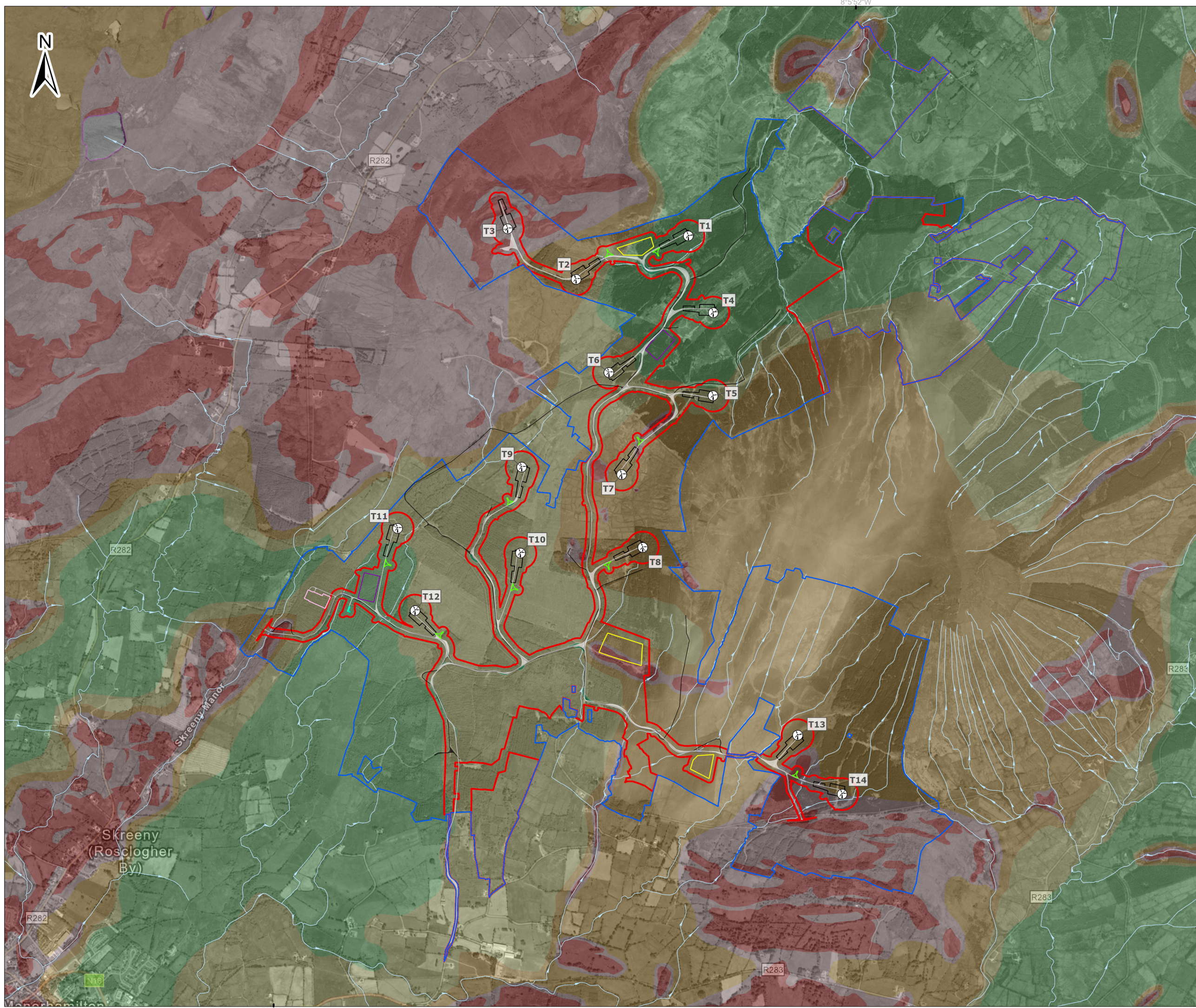
Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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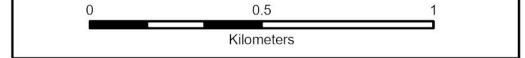
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Map Ref: 10955-006.NIS-EU.S-GWB-TOB-A Draft: **A**



- Legend**
- proposed Wind Farm Site
 - Survey Area of the proposed Wind Farm Site
 - Turbine Locations
- Site layout**
- Construction Compound
 - Borrow Pits
 - Clear Span Bridge
 - Existing Roads
 - Hardstands
 - Internal Haul Road
 - Met Mast Location
 - Oversail Area
 - Turning Bays
 - La_Substation
- Groundwater vulnerability**
- Rock at or near Surface or Karst
 - Extreme
 - High
 - Moderate
 - Low
 - Water
 - WFD - River Water Bodies



Spatial Reference
 Datum: IRENET95
 EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	20/02/2026	First issue	K.K	S.R

Client:

Project:
 Lissinagroagh Wind Farm

Title:
 Figure 5:
 Groundwater vulnerability of the Survey Area of the Proposed Wind Farm Site

Scale @ A3: 1:22,000

Prepared by: K.Kale Checked by: S.Ryan Date: February 2026

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Map Ref: 10955-001.NIS-GRD.V-P.App.BO-TOB-A Draft: A

5.1.1.1.1 [7220] Petrifying springs with tufa formation (Cratoneurion)

Within Arroo Mountain SAC, the overall area of the priority Annex I habitat type 7220* Petrifying springs with tufa formation (Cratoneurion) is 0.9ha (NPWS, 2016d). The highest concentration of occupied polygons is in the extreme west of the SAC (NPWS, 2016d), with some occurrence closer to the Application Site Boundary of the proposed Wind Farm Site (4.7km at closest distance) (NPWS, 2016d). Water chemistry is currently unknown for springs in this SAC, but characteristically, petrifying spring water has high values for pH, alkalinity and dissolved calcium and is oligotrophic (NPWS, 2016d).

Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025). Contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site has potential to have adverse effects on several attributes which determine the conservation condition of Annex I habitat type 7220 Petrifying springs as presented in Table 8-1, namely;

- Habitat area;
- Habitat distribution;
- Hydrological regime;
- Water quality; and,
- Vegetation composition.

Irish petrifying springs are highly specialised habitats which rely on permanent irrigation from groundwater (NPWS, 2025b). They are usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). The bryophytes *Palustriella commutata* and *Cratoneuron filicinum* are diagnostic of petrifying springs and are found in this habitat in the SAC (NPWS, 2016d). It is likely these specialist species would be highly susceptible to changes in water quality and flow and by extension an accidental contamination event and/or drawdown of the water table. This has potential to lead to changes in vegetation composition, and in a worst-case scenario, the loss of habitat area/distribution.

No site excavations or dewatering are proposed for the operational and decommissioning phase.

As such, potential contamination from site excavations and dewatering during the construction phase constitutes potential for **adverse effects on the integrity of Arroo Mountain SAC** by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).

5.1.1.1.2 [4010] Northern Atlantic Wet Heath with *Erica tetralix*

The total current area of the Annex I habitat type Northern Atlantic Wet Heath with *Erica tetralix* is 304.4ha, covering 7.7% of the SAC (NPWS, 2016d). A total of 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin *et al*/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment results.

According to best practice guidelines on 'A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive', the Annex I habitat type 4010 Northern Atlantic Wet Heath with *Erica tetralix* is only considered as groundwater



dependent where it occurs at a groundwater discharge zone (EPA, 2010). The seepage of groundwater to the surface results in a flush which are classified as distinct vegetation communities within the National Survey of Upland Habitats (Perrin *et al.* 2014). Consequently, it is only at these localised flushes within the wider wet heath habitat where contaminated groundwater has the potential to impact the conservation objectives of the Annex I habitat within the SAC. As flushes have not been mapped within the SAC, it is assumed they occur within the Annex I habitat type 4010 Northern Atlantic Wet Heath with *Erica tetralix* and adverse effects are limited to these locations.

Contamination of Glenaniff and Glencar GWBs and/or drawdown of the water table through site excavations in the west of the proposed Wind Farm Site, has potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 4010 Northern Atlantic Wet Heath with *Erica tetralix* as presented in Table 8-1, namely;

- Habitat area;
- Habitat distribution;
- Community diversity;
- Vegetation composition: cross-leaved heath;
- Vegetation composition: positive indicator species;
- Vegetation composition: lichens and bryophytes;
- Vegetation composition: ericoid species and crowberry;
- Vegetation composition: dwarf shrub species;
- Vegetation composition: negative indicator species;
- Vegetation composition: native trees and shrubs;
- Vegetation composition: bracken;
- Vegetation composition: soft rush;
- Vegetation structure: *Sphagnum* condition; and,
- Physical structure: disturbed bare ground.

In summary, there is potential for changes in vegetation composition/structure within flushes following alteration of groundwater flow and/or where contaminated water discharges into the Annex I habitat type 4010 Northern Atlantic Wet Heath with *Erica tetralix*, with reduction in habitat area/distribution being a worst-case scenario.

No site excavations or dewatering are proposed for the operational and decommissioning phase.

As such, potential groundwater contamination and/or alterations to groundwater flow from site excavations during the construction phase constitutes a potential for **adverse effects on the integrity of Arroo Mountain SAC**, during the construction phase by undermining the conservation objectives for the Annex I habitat type 4010 Northern Atlantic Wet Heath with *Erica tetralix*.



5.1.1.1.3 [7130] Blanket bogs (* if active bog)

The total current area of Annex I habitat type 7130 Blanket bog is 2174.9ha (54.8% of the SAC). This comprises 2096.3ha of priority Annex I habitat type 7130* Blanket bog (active) and 78.6ha of the non-priority Annex I habitat type 7130 Blanket bog (inactive) (NPWS, 2016d).

According to best practice guidelines on *A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive*, the Annex I habitat 7130 Blanket bogs (* if active bog) is only considered a groundwater dependent where it occurs at a groundwater discharge zone (EPA, 2010). The seepage of groundwater to the surface results in a flush, and flushes are classified as distinct vegetation communities within the National Survey of Upland Habitats (Perrin *et al.* 2014). Consequently, it is only at these localised flushes within the wider blanket bog habitat where contaminated groundwater has the potential to impact the conservation objectives of the Annex I habitat within the SAC. As flushes have not been mapped within the SAC, it is assumed they occur within the Annex I habitat 7130 Blanket bogs (* if active bog) and adverse effects are limited to these locations.

Contamination of Glenaniff and Glencar GWBs and/or alteration of groundwater flow through site excavations and associated dewatering in the west of the proposed Wind Farm Site has potential to have adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 7130 Blanket bog (*if active) as presented in Table 8-1, namely;

- Habitat area;
- Habitat distribution;
- Ecosystem function: peat formation;
- Community diversity;
- Vegetation composition: positive indicator species;
- Vegetation composition: lichens and bryophytes ;
- Vegetation composition: potential dominant species;
- Vegetation composition: negative indicator species;
- Vegetation composition: non native species;
- Vegetation composition: native trees and shrubs;
- Vegetation structure: *Sphagnum* condition;
- Physical structure: disturbed bare ground; and,
- Physical structure: erosion.

In summary, there is potential for changes in vegetation composition/structure within flushes following alteration of groundwater flow and/or where the contaminated water discharges into the Annex I habitat type 7130 Blanket bog, with reduction in habitat area/distribution and bare ground/peat erosion being worst-case outcomes.

No site excavations or dewatering are proposed for the operational and decommissioning phase.

As such, potential contamination from site excavations during the construction phase constitutes potential for **adverse effects on the integrity of Arroo Mountain SAC**, during the



construction phase by undermining the conservation objectives for the Annex I habitat type 7130 Blanket bog (*if active).

5.1.1.2 *Ballysadare Bay SAC*

The construction phase of the proposed GCR has the potential to negatively impact the water quality status of Ballysadare Bay SAC, as proposed trenching along the public road is within 50m of the Ballygrania (EPA Code: 35_741), which forms part of the WFD river waterbody Unshin_040. Following a period of heavy rainfall there is potential for contaminants or sediment to be washed into the waterbodies, in the absence of mitigation. This constitutes potential for adverse effects on European sites, such as Ballysadare Bay SAC located c. 17km downstream. Due to the separation distances involved and the limited extent of the works along the GCR, it is unlikely adverse effects on the integrity of the SAC will arise. However, adverse effects are considered here following a precautionary approach.

The proposed GCR has the potential to result in adverse effects on the QIs of Ballysadare Bay SAC, specifically those occurring within the estuary and which are sensitive to water quality, including (NPWS, 2013b):

- 1130 Estuaries;
- 1140 Mudflats and sandflats not covered by seawater at low tide; and,
- 1365 Harbour Seal.

There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.

5.1.1.2.1 [1130] Estuaries

The proposed GCR has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which lead downstream to Ballysadare Estuary. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 1130 Estuaries as presented in Table 8-2, namely;

- Community extent;
- Community structure: *Zostera* density; and,
- Community distribution.

Adverse effects on the extent, distribution and structure of the aquatic plant communities would constitute an **adverse effect on the integrity of Ballysadare Bay SAC**, during the construction phase by undermining the conservation objective for this Annex I habitat type.

5.1.1.2.2 [1140] Mudflats and sandflats not covered by seawater at low tide

The proposed GCR has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which lead downstream to Ballysadare Estuary. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 1140 Mudflats and sandflats not covered by seawater at low tide as presented in Table 8-2, namely;

- Community extent;



- Community structure: *Zostera* density; and,
- Community distribution.

Adverse effects on the extent, distribution and structure of the *Zostera* dominated community would constitute an **adverse effect on the integrity of Ballysadare Bay SAC**, during the construction phase by undermining the conservation objective for this Annex I habitat type.

5.1.1.2.3 [1365] Harbour Seal

Ballysadare Bay SAC is located 8.9km north-west of the proposed GCR at nearest distance. As such, there is no potential for adverse effects on the attributes which determine the conservation condition of the Annex II species Harbour seal, as detailed in Table 8-2.

5.1.1.3 Ballysadare Bay SPA

None of the SCI species listed below were recorded within the proposed Wind Farm Site in the last 5 years of survey data (TOBIN, 2026). Therefore, no ecological connectivity exists between the SPA and the proposed Wind Farm Site.

The construction phase of the proposed GCR, has the potential to release sediment and/or contaminants into nearby watercourses. As Ballysadare Bay SPA occurs downstream of this watercourse, this constitutes potential for adverse effects on good water quality dependent receptors within the SPA.

The SCIs/QI for this SPA are (NPWS, 2013b):

- [A046] Light-bellied Brent goose (*Branta bernicla hrota*);
- [A141] Grey plover (*Pluvialis squatarola*);
- [A149] Dunlin (*Calidris alpina alpina*);
- [A157] Bar-tailed godwit (*Limosa lapponica*);
- [A162] Redshank (*Tringa tetanus*); and,
- [A999] Wetlands.

There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.

5.1.1.3.1 [A046] Light-bellied brent goose (*Branta bernicla hrota*)

This SPA contains extensive intertidal flats where the vascular plants Eelgrass (*Zostera marina*) and Beaked Tasselweed (*Ruppia maritima*) occur (NPWS, 2010a). These habitats provide an important food resource for herbivorous wildfowl, including Light-bellied Brent Goose.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the proposed GCR has the potential to adversely affect several attributes that determine the conservation condition of this SCI species, as presented in Table 8-3, namely;

- Population trend; and,
- Distribution



Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. If they were to occur during the construction phase, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.3.2 [A141] Grey plover (*Pluvialis squatarola*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2010a). These habitats provide an important food resource for wintering waterfowl, including Grey plover, as well as important roosting sites.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the proposed GCR has the potential to adversely affect several attributes that determine the conservation condition of this SCI species, as presented in Table 8-3, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. If they were to occur during the construction phase, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.3.3 [A149] Dunlin (*Calidris alpina alpina*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2010a). These habitats provide an important food resource for wintering waterfowl, including Dunlin, as well as important roosting sites.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the proposed GCR has the potential to adversely affect several attributes that determine the conservation condition of this SCI species, as presented in Table 8-3, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. If they were to occur during the construction phase, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.3.4 [A157] Bar-tailed godwit (*Limosa lapponica*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2010a). These habitats provide an important food resource for wintering waterfowl, including Bar-tailed godwit, as well as important roosting sites.



In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the proposed GCR has the potential to adversely affect several attributes that determine the conservation condition of this SCI species, as presented in Table 8-3, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. If they were to occur during the construction phase, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.3.5 [A162] Redshank (*Tringa tetanus*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2010a). These habitats provide an important food resource for wintering waterfowl, including Redshank, as well as important roosting sites.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the proposed GCR has the potential to adversely affect several attributes that determine the conservation condition of this SCI species, as presented in Table 8-3, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. If they were to occur during the construction phase, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.3.6 [A999] Wetlands

This SPA contains extensive intertidal sand and mudflats. The flats support good populations of macro-invertebrates which are important food items for wintering waterfowl. Common species present include the polychaete worms *Hediste diversicolor*, *Arenicola marina*, *Lanice conchilega* and *Nephtys hombergii*, and the bivalves *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*. Also present on the intertidal flats are the vascular plants Eelgrass (*Zostera marina*) and Beaked Tasselweed (*Ruppia maritima*), which provide food for herbivorous wildfowl. Well-developed salt marshes, which provide roosting sites for birds at high tide, occur at several locations around the bay. The sandy beaches around the Strandhill peninsula are used by roosting birds (NPWS, 2010a).

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with trenching activities required for the construction of the GCR has the potential to adversely affect the attributes that determine the conservation condition of this QI habitat, as presented in Table 8-3, namely;

- Habitat area.



Such effects could lead to a reduction in the area of these habitats and, if they were to occur during the construction phase, **would constitute an adverse effect on the integrity of the affected European site in view of its conservation objectives.**

5.1.1.4 Ben Bulben, Gleniff and Glenade SAC

The construction phase of the proposed Wind Farm Site, specifically the site excavations along the western site entrance towards the nearby substation and construction compound as well as the turbine hardstand at T11, constitute a source of potential contamination of the Glencar GWB. The Glencar GWB also encompasses the Ben Bulben, Gleniff and Glenade SAC and as such, this constitutes a pathway for potential adverse effects on groundwater dependent receptors within the SAC.

Site excavations will increase the vulnerability of the underlying aquifer to pollution through either a complete loss of overburden where cuttings are into the bedrock or by reducing the overburden depth and thus increasing the vulnerability for contaminated drainage (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4). Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table, and the attenuating capacity of the geological deposits through which the water travels (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4).

The Glencar GWB at the western site entrance is considered to have extreme vulnerability (Figure 5). The groundwater vulnerability of the Glencar GWB at T11 and the nearby substation is considered moderate and the groundwater vulnerability at the nearby construction compound is considered low.

Groundwater flow through karst areas is extremely complex and difficult to predict (2004b). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (2004b). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (2004b). This constitutes potential for adverse effects on ground water dependant QI habitats through groundwater contamination associated with site excavation works at T11 as well as the site entrance, substation, and construction compound, all located to the south-west of T11.

Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.4.5.2). Dewatering to accommodate construction activities at T11, has the potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats.

As such, there is potential for adverse effects on the QI habitats for the SAC which are groundwater dependent as a result alterations to groundwater quality and flow, namely (NPWS, 2021a);

- 7220 Petrifying springs with tufa formation (Cratoneurion);
- 7230 Alkaline fens;
- 4010 Northern Atlantic wet heaths with *Erica tetralix*;
- 7130 Blanket bogs (* if active bog);
- 7140 Transition mires and quaking bogs; and,



- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.

5.1.1.4.1 [7220] Petrifying springs with tufa formation (Cratoneurion)

Petrifying springs are associated with discharging calcium-saturated water, which upon contact with the atmosphere release carbon dioxide to the air producing a precipitate of calcium carbonate in the form of marl or 'tufa', deposits (NPWS, 2021a). The total extent of the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion) within the SAC is 2.6ha (NPWS, 2021a). The highest concentration of mapped springs is along the northern boundary of the SAC, with the closet spring to the proposed Wind Farm Site at a distance of 8.5km which is located in the extreme east of the SAC (NPWS, 2021a).

Petrifying springs depend on a permanent supply of water (NPWS, 2021a). Dewatering at T11 has the potential to cause groundwater drawdown and alter groundwater flow paths within the karstified aquifer. Groundwater vulnerability at this T11 has been classified as moderate. This constitutes potential for adverse effects on the QI habitat.

Water chemistry is currently unknown for springs in this SAC, but characteristically, petrifying spring water has high values for pH, alkalinity and dissolved calcium and is oligotrophic (NPWS, 2016d). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). This constitutes potential for adverse effects on the QI habitat.

Dewatering associated with construction activities at T11 and contamination of the Glencar GWBs through site excavations at T11, as well as the nearby substation, construction compound, and western site entrance, constitute potential for adverse effects on several attributes which determine the conservation condition of Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion) as presented in Table 8-4, namely;

- Habitat area;
- Habitat distribution;
- Hydrological regime: height of water table; and,
- Physical structure: tufa formation;
- Vegetation composition: community diversity;
- Vegetation composition: positive indicator species;
- Vegetation composition: negative indicator species;
- Vegetation structure: sward height; and,
- Indicators of local distinctiveness.

Irish petrifying springs are highly specialised habitats, that are usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). Several bryophyte species of conservation interest have been identified within the QI habitat within the SAC (Table 8-4). It is likely these specialist species would be highly susceptible to changes in water quality and and by extension an accidental contamination event. As such, there is potential for adverse effects on vegetation composition, vegetation structure as well as indicators of local distinctiveness.

Similarly, these species are likely to be susceptible to the effects of dewatering, namely lowering of the water table and alterations to ground water flow. As such, there is potential for adverse



effects on hydrological regime, physical structure, resulting in changes to vegetation composition, vegetation structure and indicators of local distinctiveness, and under a worst-case scenario loss of habitat area and distribution.

No dewatering or site excavations will take place during the operational and decommissioning phase.

As such, dewatering at T11 as well as potential contamination from site excavations at T11 as well as the nearby substation, construction compound, and western site entrance, constitutes potential for **adverse effects on the integrity of Ben Bulbin, Gleniff and Glenade SAC** by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).

5.1.1.4.2 [7230] Alkaline fens

The Annex I habitat type 7230 Alkaline fens occupies 22.7ha, covering only 0.4% of the SAC (NPWS, 2021a). The Annex I habitat type 7230 Alkaline fens occur across the SAC on lower slopes, most frequently below the cliffs at Annacoona (NPWS, 2021a). Four different alkaline fen vegetation communities were identified within the SAC (NPWS, 2021a).

Dewatering at T11 as well as potential contamination of the Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound and the western site entrance, all have potential to reduce the groundwater quality and flow discharging into the QI habitat, leading to adverse effects on several attributes which determine the conservation condition of Annex I habitat type 7230 Alkaline fens as presented in Table 8-4, namely;

- Habitat area;
- Habitat distribution ;
- Ecosystem function: peat formation;
- Ecosystem function: water quality;
- Community diversity;
- Vegetation composition: positive indicator species (brown mosses);
- Vegetation composition: positive indicator species (vascular plants);
- Vegetation composition: cover of positive indicator species;
- Vegetation composition: negative indicator species;
- Vegetation composition: native trees and shrubs;
- Vegetation composition: soft rush and common reed cover;
- Vegetation structure: height;
- Physical structure: disturbed bare ground.

As wetland species, specialist fen flora is likely susceptible to changes in water quality and by extension an accidental contamination event. Similarly, fen flora is susceptible to the effects of dewatering, namely the lowering of the water table and alteration of ground water flows. As such, there is potential for adverse effects on the above listed attributes which define the favourable conservation status of the Annex I habitat type 7230 Alkaline fens., with a worst-case, scenario involving habitat loss within the SAC.



No dewatering or site excavations will take place during the operational and decommissioning phase.

As such, dewatering at T11 and potential contamination of the groundwater body from site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, constitutes potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC** during the construction phase by undermining the conservation objectives for the Annex I habitat type 7230 Alkaline fens.

5.1.1.4.3 [4010] Northern Atlantic wet heaths with *Erica tetralix*

The separation distance from the QI habitat to the proposed Wind Farm Site at nearest distance is 8.4km. The total current area of the Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* within the SAC is 44.4ha, covering 0.7% of the SAC (NPWS, 2021a). Flushes are the only component of wet heath habitat considered to be groundwater dependent (EPA, 2010). As such it is the flushes within the wet heath habitat which are at potential risk in the unlikely event of contamination of the Glencar GWB and/or dewatering associated with construction activities at T11.

Dewatering at T11 and contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, all constitute potential for adverse effects on several attributes which determine the conservation condition of Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* as presented in Table 8-4, namely;

- Habitat area;
- Community diversity;
- Vegetation composition: cross-leaved heath;
- Vegetation composition: positive indicator species;
- Vegetation composition: lichens and bryophytes;
- Vegetation composition: ericoid species and crowberry;
- Vegetation composition: dwarf shrub species ;
- Vegetation composition: negative indicator species;
- Vegetation composition: native trees and shrubs;
- Vegetation composition: bracken;
- Vegetation composition: soft rush; and,
- Physical structure: disturbed bare ground.

As wetland species, specialist peatland flora is likely susceptible to changes in water quality and by extension an accidental contamination event. Similarly, peatland flora is susceptible to the effects of dewatering, namely the lowering of the water table and alteration of ground water flows. As such, there is potential for adverse effects on the above listed attributes which define the favourable conservation status of the Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix*, with a worst-case, scenario involving habitat loss within the SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.



As such, dewatering at T11 and contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, all constitute the potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC** during the construction phase of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix*.

5.1.1.4.4 [7130] Blanket bogs (* if active bog)

The total area of the Annex I habitat type Blanket bog (* if active) in the Ben Bulben, Gleniff and Glenade Complex SAC is 2,134.5ha, which comprises 35.6% of the SAC (NPWS, 2021a). This total figure comprises 2,083.5ha of active blanket bog and 51.0ha of inactive blanket bog (NPWS, 2021a). Flushes are the only component of blanket bogs which are considered to be groundwater dependent (EPA, 2010). As such it is the area of flushes within blanket bog which are at potential risk following the unlikely event of contamination of the Glencar GWB.

Dewatering at T11 and potential contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and the western site entrance, all have potential to have adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 7130 Blanket bog (*if active) as presented in Table 8-4, namely;

- Habitat area;
- Habitat distribution;
- Ecosystem function: peat formation;
- Community diversity;
- Vegetation composition: positive indicator species;
- Vegetation composition: lichens and bryophytes ;
- Vegetation composition: potential dominant species;
- Vegetation composition: negative indicator species;
- Vegetation composition: non-native species;
- Vegetation composition: native trees and shrubs;
- Vegetation structure: *Sphagnum* condition;
- Physical structure: disturbed bare ground; and
- Physical structure: erosion.

As wetland species, specialist peatland flora is likely susceptible to changes in water quality and by extension an accidental contamination event. Similarly, peatland flora is susceptible to the effects of dewatering, namely the lowering of the water table and alteration of ground water flows. As such, there is potential for adverse effects on the above listed attributes which define the favourable conservation status of the Annex I habitat type 7130 Blanket bog (*if active), with a worst-case, scenario involving habitat loss within the SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.



As such, dewatering at T11 and contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, all constitute the potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC** during the construction phase of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type Blanket bog (* if active).

5.1.1.4.5 [7140] Transition mires and quaking bogs

The total area of the Annex I habitat type 7140 Transition mires and quaking bogs in the Ben Bulben, Gleniff and Glenade Complex SAC is 4.1ha, covering only c.0.1% of the total land area within the SAC (NPWS, 2021a). The distribution of the Annex I habitat type 7140 Transition mires and quaking bogs is located throughout the SAC (NPWS, 2021a) and is located c. 8.4km from the proposed Wind Farm Site at nearest distance. The Annex I habitat type 7140 Transition mires and quaking bogs is considered a groundwater dependent habitat (EPA, 2010).

Dewatering at T11 and potential contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and the western site entrance, all have potential to have adverse effects on several attributes which determine the conservation condition of the conservation condition of the Annex I habitat type 7140 Transition mires and quaking bogs as presented in Table 8-4, namely;

- Habitat area;
- Habitat distribution;
- Community diversity;
- Vegetation composition: number of positive indicator species;
- Vegetation composition: number of core positive indicator species (number);
- Vegetation composition: cover of positive indicator species (percentage);
- Vegetation composition: negative indicator species;
- Vegetation composition: height; and,
- Physical structure: disturbed bare ground.

The specialist flora associated with the Annex I habitat type 7140 Transition mires and quaking bogs is likely susceptible to changes in water quality and by extension an accidental contamination event. Similarly, the flora is likely susceptible to the effects of dewatering, namely the lowering of the water table and alteration of ground water flows. As such, there is potential for adverse effects on the above listed attributes which define the favourable conservation status of the Annex I habitat type 7140 Transition mires and quaking bogs, with a worst-case, scenario involving habitat loss within the SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.

As such, dewatering at T11 and contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, all constitute the potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC**, during the construction phase of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type 7140 Transition mires and quaking bogs.



5.1.1.4.6 [6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

The distribution of Annex I habitat type 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels is widespread across the SAC, with the habitat being 8.9km at nearest distance to the proposed Wind Farm Site. Two vegetation communities representing the Annex I habitat type were identified within this SAC, namely TH2 - *Cochlearia pyrenaica* tall herb vegetation and TH3 - *Sedum rosea-Angelica sylvestris* tall herb vegetation (NPWS, 2021a).

Dewatering at T11 and potential contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and the western site entrance, all have potential to have adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels as presented in Table 8-4, namely;

- Habitat area;
- Habitat distribution;
- Community diversity;
- Vegetation composition: number of core positive indicator species (number);
- Vegetation composition: cover of positive indicator species (percentage);
- Vegetation structure: height/flowering; and
- Physical structure: disturbed bare ground.

The specialist flora associated with the Annex I habitat type 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels is likely susceptible to changes in water quality and by extension an accidental contamination event. Similarly, the flora is likely susceptible to the effects of dewatering, namely the lowering of the water table and alteration of ground water flows. As such, there is potential for adverse effects on the above listed attributes which define the favourable conservation status of the Annex I habitat type 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, with a worst-case, scenario involving habitat loss within the SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.

As such, dewatering at T11 and contamination of the Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance, all constitute the potential for **adverse effects on the integrity of Ben Bulbin, Gleniff and Glenade SAC**, during the construction phase of the Proposed Project by undermining the conservation objectives for the Annex I habitat type 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.

5.1.1.4.7 [1355] European Otter

The proposed Wind Farm Site is located 13.8km west of the SAC, at nearest distance. Contamination of the Glencar GWB through site excavations in the west of the proposed Wind Farm Site have the potential to impact the water quality of Glencar Lake, which in turn may



impact a single attribute which determines the conservation condition of the Annex II species 1355 European otter as presented in Table 8-4, namely;

- Fish biomass available.

No site excavations will take place during the operational and decommissioning phase. As such, potential contamination from site excavations constitutes a potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC**, during the construction phase of the Proposed Project by undermining the conservation objectives for the Annex II species 1355 European otter.

Along the TDR, POI 25 is located c. 137m from the boundary of Ben Bulben, Gleniff and Glenade SAC at nearest distance. A short section (c. 10m) of Hedgerow (WL1) bordering the public road network will be trimmed to accommodate an over sail area.

In the absence of mitigation, there is potential for this vegetation removal to result in disturbance and/or displacement of European otter as a result of the proposed works. Best practice guidance on *The Treatment of Otters Prior to the Construction of National Road Schemes*, prohibits construction works within 20-150m of otter breeding/resting places (NRA, 2008a) due to the potential for disturbance. As such, there is potential for adverse effects on the distribution of the species temporarily as the vegetation removal is taking place as the European otter use Hedgerow (WL1) habitat for locating couches/holts. As POI 25 is located c. 137m from the boundaries of the SAC inclusive of the protected WFD river waterbody Drumcliff_010 watercourse, there is potential that any European otter within the area is part of the SAC population. Noise, vibration, lighting, and human activity, have the potential to temporarily disturb/displace European otter within the SAC, particularly during dawn and dusk when the species is most active.

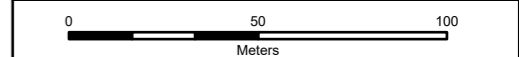
This constitutes potential adverse effects on two attributes which determine the conservation condition of the Annex II species European otter Table 8-4, namely;

- Distribution; and,
- Couching sites and holts.

In the absence of mitigation, disturbance constitutes potential for **adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC**, during the construction and decommissioning phases of the Proposed Project by undermining the conservation objectives for the Annex II species 1355 European otter.



- Legend**
- Point of Interest - Locations
 - TDR: works areas
 - Oversail
 - Special Areas of Conservation (SACs)
 - WFD - River Water Bodies



Spatial Reference
 Datum: IRENET95
 EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	19/02/2026	First issue	S.P	S.R

Client:

Project:
 Lissinagroagh Wind Farm

Title:
 Figure 6:
 Location of POI 25 and
 Ben Bulben, Glenaniff
 and Glenade SAC

Scale @ A3: 1:2,000

Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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Map Ref: 10955-008.NIS-SACs-POI25-TOB-A Draft: A

54°20'12"N

574400

842800

5.1.1.5 Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC

Hydrological connectivity exists between Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Proposed Project via the *Sligo* which is part of the WFD river waterbody Garavogue_010 (EPA Code: 35S23). The *Sligo* passes under the public road N-15, and discharges into the SAC, 0m from POI 13 along the TDR (Figure 7).

The vegetation clearance associated with the over run at POI 13 involves the removal of topsoil. The vegetation removal within the over sail area involves the removal of c. 0.01ha of Scrub (WS1) and c. 17m of Hedgerow (WL1), but no topsoil. There is no potential loss of QI habitats within the SAC as a result of this habitat loss.

In the absence of mitigation there is potential for adverse effects on the integrity of the SAC as a result of siltation. The potential for an accidental spillage or leakage of contaminants from machinery and/or vehicles is considered potential for adverse effects, although the likelihood is low. In the absence of mitigation there is potential for adverse effects on the integrity of the SAC through contamination of the watercourse.

The QIs for the SAC which have potential for adverse effects as a result of the siltation associated with the over run and/or an accidental contamination event at POI 13 along the TDR are:

- Estuaries [1130];
- Mudflats and sandflats not covered by seawater at low tide [1140];
- Sea Lamprey (*Petromyzon marinus*) [1095];
- River Lamprey (*Lampetra fluviatilis*) [1099]; and,
- Harbour Seal (*Phoca vitulina*) [1365].





- Legend**
- Point of Interest - Locations
 - TDR: works areas
 - Overrun
 - Oversail
 - Special Areas of Conservation (SACs)
 - WFD - River Water Bodies



Spatial Reference		Copyrights:	
Datum: IRENET95		Sources: Esri, TomTom, Garmin, FAO,	
EPSG: 2157		NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community,	

Rev	Date	Description	By	Chkd.
A	19/02/2026	First issue	S.P	S.R

Client: **FuturEnergy Ireland**

Project: **Lissinagroagh Wind Farm**

Title: **Figure 7:
Cummeen Strand/Drumcliff Bay SAC and POI 13**

Scale @ A3: 1:2,000

Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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Map Ref: 10955-007.NIS-SACs-POI13-TOB-A Draft: **A**

54°16'43"N

836600

568800

5.1.1.5.1 [1130] Estuaries

Within Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC there is an estimated total of 1258 ha of the Annex I habitat type 1130 Estuaries (NPWS, 2024a). The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to the SAC.

Siltation/contamination of the surface waters constitute a pathway for potential adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 1130 Estuaries as presented in Table 8-5, namely;

- Community extent;
- Community structure: *Zostera* density;
- Community structure: *Mytilus edulis* density; and,
- Community distribution.

As such, siltation/contamination from the removal of topsoil at POI 13 constitutes potential for **adverse effects on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC**, during the construction and decommissioning phases of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type 1130 Estuaries.

5.1.1.5.2 [1140] Mudflats and sandflats not covered by seawater at low tide

Within Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC there is an estimated total of 2288 ha of the Annex I habitat type Annex I habitat type 1140 Mudflats and sandflats not covered by seawater at low tide (NPWS, 2024a). The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary.

Siltation/contamination of the surface waters constitute a pathway for potential adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 1140 Mudflats and sandflats not covered by seawater at low tide as presented in Table 8-5, namely;

- Community extent;
- Community structure: *Zostera* density (presence/absence);
- Community structure: *Zostera* density (shoots/m²);
- Community structure: *Mytilus edulis* density; and,
- Community distribution.

As such, siltation/contamination from the removal of topsoil at POI 13 constitutes potential for **adverse effects on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC**, during the construction and decommissioning phases of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type 1140 Mudflats and sandflats not covered by seawater at low tide.

5.1.1.5.3 [1095] Sea Lamprey (*Petromyzon marinus*)

For Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC there is only one attribute listed in the conservation objectives for the Annex II species 1095 Sea lamprey, as presented in Table 8-5, namely;



- Distribution: extent of anadromy.

No instream works will take place within waterbodies (*Sligo*) hydrologically connected to Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC. As such, there is no potential for the Proposed Project to inhibit estuary accessibility for lamprey. There is **no pathway for potential adverse effects** on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC through the attributes which define the conservation condition for the Annex II species 1095 Sea lamprey.

5.1.1.5.4 [1099] River Lamprey (*Lampetra fluviatilis*)

For Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC there is only one attribute listed in the conservation objectives for the Annex II species 1099 River lamprey, as presented in Table 8-5, namely;

- Distribution: extent of anadromy.

No instream works will take place within waterbodies (*Sligo*) hydrologically connected to Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC. As such, there is no potential for the Proposed Project to inhibit estuary accessibility for lamprey. There is **no pathway for potential adverse effects** on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC through the attributes which define the conservation condition for the Annex II species 1099 River lamprey.

5.1.1.5.5 [1365] Harbour Seal (*Phoca vitulina*)

Whilst proposed accommodations along the TDR at POI 13 will occur 0m from the SAC boundary, the removal of trees and vegetation is not considered to pose a risk of disturbance to the Annex II species 1365 Harbour seal.

The busy junction along the N15 provides a baseline of human activity to which seals are likely accustomed. Harbour seals are most vulnerable to disturbance when they haul out of the water most typically during the breeding season (May-July) (NPWS, 2024b). There are no known resting haul out sites within Sligo Harbour, where PO1 13 is located (NPWS, 2024b). All mapped haul out sites are located within Drumcliff Bay c. 4.8km to the north (NPWS, 2024b). As there are no know haul out sites in the vicinity of POI 13, there is no potential pathway for the Proposed Project to disturb the Annex II species 1365 Harbour seal.

The attributes which define the conservation condition for the Annex II species 1365 Harbour seal are presented in Table 8-5, namely;

- Access to suitable habitat;
- Breeding behaviour;
- Moulting behaviour;
- Resting behaviour;
- Disturbance.

There is **no potential adverse effects** on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC through the attributes which define the conservation condition for the Annex II species Annex II species 1365 Harbour seal.



5.1.1.6 Cummeen Strand SPA

Accommodations associated with the over sail and over run areas at POI 13 along the TDR, will involve the removal of vegetation and topsoil. These activities have the potential to result in the release of sediment and/or contaminants to nearby watercourses and/or cause disturbance to SCI species within the SPA.

As Cummeen Strand SPA is located downstream of POI 21 with hydrological connectivity via the Willsborough Stream_010 and in close proximity to POI 13 (approximately 20m), potential exists for adverse effects on receptors within the SPA that are sensitive to changes in water quality and/or sensitive to disturbance. The SCIs of Cummeen Strand SPA are:

- [A046] Light-bellied Brent Goose (*Branta bernicla hrota*);
- [A130] Oystercatcher (*Haematopus ostralegus*);
- [A162] Redshank (*Tringa totanus*); and,
- [A999] Wetland.

Works along the TDR will take place during the construction and decommissioning phase to facilitate the delivery of abnormal indivisible loads.

5.1.1.6.1 [A046] Light-bellied Brent Goose (*Branta bernicla hrota*)

This species is known to be highly sensitive to noise and visual disturbance, with reported disturbance distances ranging from approximately 105m to 205m, depending on the nature and intensity of the stimulus (Cutts *et al.*, 2013). In areas where Light-bellied brent geese are quarry species, the range at which they react to stimuli increases to 350m (Cutts *et al.*, 2013). As such, mitigation measures are generally advised if Light-bellied brent geese are within 400m of high-level visual disturbance (Cutts *et al.*, 2013). Due to the sensitivity of the species, they are unlikely to be found in areas with high levels of general disturbance (Cutts *et al.*, 2013). As the N4/N15 provides a high baseline level of disturbance from daily traffic, it is likely that Light-bellied brent geese do not forage and roost within 350m to 400m of POI 13.

It follows then that there is **no potential for disturbance events associated with POI 13 to result in adverse effects on Light-bellied brent geese nor the overall integrity of Cummeen Strand SPA in view of the conservation objectives.**

This SPA contains extensive intertidal flats where beds of eelgrass (*Zostera spp.*) provide an important food resource for herbivorous wildfowl, including Light-bellied brent geese (NPWS, 2014a). In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, effects associated with over sail and over run areas required for the construction of the TDR, have the potential to result in the degradation of supporting marine habitats for SCI species. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. This constitutes adverse effects on the attributes that determine the conservation condition of this SCI species, as presented in Table 8-6, namely;

- Population trend; and,
- Distribution.

Such effects should they occur during the construction and decommissioning phases of the Proposed Project, could result in a reduction in the availability, area, or distribution of suitable



habitat, or lead to the displacement of SCI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA.

In the absence of mitigation, the proposed accommodations at POI 13 **constitute potential for adverse effects on Light-bellied brent geese and the overall integrity of the Cummeen Strand SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.6.2 [A130] Oystercatcher (*Haematopus ostralegus*)

Oystercatcher is considered relatively tolerant of moderate to high levels of visual disturbance and will habituate to ongoing activity (Cutts *et al.*, 2013). At locations with on-going disturbance, such as a typical estuary, flushing distances range from 25m to 200m (Cutts *et al.*, 2013). For agricultural vehicles, the flushing threshold is 60m, and this figure is assumed to be synonymous with that for construction plant (Cutts *et al.*, 2013). Oystercatcher has been observed within 1km of POI 13 (AASR, Table 10).

POI 13 is located along the N4/N15, where baseline disturbance levels are high due to traffic along the national road network. This suggests any oystercatcher foraging and/or roosting in proximity of the N4/N15 are habituated to baseline levels of disturbance. The proposed clearance of vegetation and topsoil at POI 13 to facilitate the delivery of an abnormal indivisible loads along the TDR, is highly localised. No works will take place within the intertidal sand and mudflats as all works are restricted to the road network.

It follows then that there is **no potential for disturbance events associated with POI 13 to result in adverse effects on Oystercatcher nor adverse effects on the overall integrity of Cummeen Strand SPA in view of the conservation objectives**.

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2014a). These habitats provide key foraging and roosting areas for SCI species, including oystercatcher.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, and/or disturbance or displacement effects associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this SCI species, as presented in Table 8-6, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA, during the construction and decommissioning phases of the Proposed Project. In the absence of mitigation, the proposed accommodations at POI 13 **constitute potential for adverse effects on oystercatcher and the overall integrity of the SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.



5.1.1.6.3 [A162] Redshank (*Tringa totanus*)

Redshank are very tolerant of moderate to high levels of disturbance and the species habituates to works rapidly (Cutts *et al.*, 2013). The species will forage <50m from construction plant (Cutts *et al.*, 2013).

POI 13 is located along the N4/N15, where baseline disturbance levels are high due to traffic along the national road network. This suggests any Redshank foraging in proximity of the N4/N15 are habituated to high baseline disturbance events. Indeed, Redshank has been observed within 1km of POI 13 (AASR, Table 10).

The proposed clearance of vegetation and topsoil at POI 13 to facilitate the delivery of an abnormal indivisible loads along the TDR, is highly localised. No works will take place within the intertidal sand and mudflats as all works are restricted to the road network. This suggests any Redshank foraging/roosting in proximity of the N4/N15 are habituated to baseline disturbance levels.

It follows then that there is **no potential for disturbance events associated with POI 13 to result in adverse effects on Redshank nor adverse effects on the overall integrity of the Cummeen Strand SPA in view of the conservation objectives.**

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2014a). These habitats provide key foraging and roosting areas for SCI species, including Redshank. In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, and/or disturbance or displacement effects associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this qualifying interest species, as presented in Table 8-6, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA, during the construction and decommissioning phases of the Proposed Project. In the absence of mitigation, the proposed accommodations at POI 13 **constitute potential for adverse effects on the Redshank and the overall integrity of Cummeen Strand SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.6.4 [A999] Wetlands

At this SPA during low tide, extensive sand and mud flats are exposed. These support a diverse macro-invertebrate fauna which provides the main food supply for the wintering waterfowl. Invertebrate species such as Lugworm (*Arenicola marina*), Ragworm (*Hediste diversicolor*), Cockles (*Cerastoderma edule*), Sand Mason (*Lanice conchilega*), Baltic Tellin (*Macoma balthica*), Spire Shell (*Hydrobia ulvae*) and Mussels (*Mytilus edulis*) are frequent. Of particular note is the presence of eelgrass (*Zostera noltii* and *Z. angustifolia*) beds, which provide a valuable food stock for herbivorous wildfowl. The estuarine and intertidal flat habitats are of conservation significance and are listed on Annex I of the E.U. Habitats Directive. Areas of salt marsh fringe the bay in places and provide roosting sites for birds during the high tide periods (NPWS 2014a).



In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this QI habitat, as presented in Table 8-6, namely;

- Habitat area.

Such effects should they occur during the construction and decommissioning phases of the Proposed Project, could lead to a reduction in the area of these habitats and, if this were to occur, **would constitute an adverse effect on the integrity of Cummeen Strand SPA in view of the conservation objectives.**

5.1.1.6.5 [A046] Light-bellied Brent Goose (*Branta bernicla hrota*)

This SPA contains extensive intertidal flats where beds of Eelgrass (*Zostera noltii* and *Z. angustifolia*) occur (NPWS, 2014a). These habitats provide an important food resource for herbivorous wildfowl, including Light-bellied Brent Goose.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, and/or disturbance or displacement effects associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this SCI species, as presented in Table 8-6, namely;

- Population trend; and,
- Distribution.

Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas, during the construction and decommissioning phases of the Proposed Project. This could, in turn, affect population trends or spatial distribution within the SPA and **would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.6.6 [A130] Oystercatcher (*Haematopus ostralegus*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2014a). These habitats provide key foraging and roosting areas for SCI species, including Oystercatcher.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, and/or disturbance or displacement effects associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this SCI species, as presented in Table 8-6, namely;

- Population trend; and,
- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA, during the construction and decommissioning phases of the Proposed Project. If they were to occur, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**



5.1.1.6.7 [A162] Redshank (*Tringa totanus*)

This SPA contains extensive intertidal sand and mudflats which support good populations of macro-invertebrates which are important food items for wintering waterfowl (NPWS, 2014a). These habitats provide key foraging and roosting areas for SCI species, including Redshank.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, and/or disturbance or displacement effects associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this qualifying interest species, as presented in Table 8-6, namely;

Population trend; and,

- Distribution.

Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA, during the construction and decommissioning phases of the Proposed Project. If they were to occur, **these effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.**

5.1.1.6.8 [A999] Wetlands

At this SPA during low tide, extensive sand and mud flats are exposed. These support a diverse macro-invertebrate fauna which provides the main food supply for the wintering waterfowl. Invertebrate species such as Lugworm (*Arenicola marina*), Ragworm (*Hediste diversicolor*), Cockles (*Cerastoderma edule*), Sand Mason (*Lanice conchilega*), Baltic Tellin (*Macoma balthica*), Spire Shell (*Hydrobia ulvae*) and Mussels (*Mytilus edulis*) are frequent. Of particular note is the presence of eelgrass (*Zostera noltii* and *Z. angustifolia*) beds, which provide a valuable food stock for herbivorous wildfowl. The estuarine and intertidal flat habitats are of conservation significance and are listed on Annex I of the E.U. Habitats Directive. Areas of salt marsh fringe the bay in places and provide roosting sites for birds during the high tide periods (NPWS 2014a).

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this QI habitat, as presented in Table 8-6, namely;

- Habitat area.

Such effects should they occur during the construction and decommissioning phases of the Proposed Project, could lead to a reduction in the area of these habitats and, if this were to occur, **would constitute an adverse effect on the integrity of the affected European site in view of its conservation objectives.**

5.1.1.7 Donegal Bay SPA

Donegal Bay SPA is located in close proximity to POI 53 (approximately 300m), as such potential exists for adverse effects on receptors within the SPA that are sensitive to disturbance.

In addition, the proposed accommodations in the over run areas at POI 50, 51, 52, and 53 will involve the removal of topsoil. There is downstream hydrological connectivity with the SPA and POI 50, 51, 52, and 53 via the Clarcarricknagun_010, Abbey_010, Bradoge_020, and



Drowes_010 respectively. As the Donegal Bay SPA is located downstream of the identified watercourses, potential exists for adverse effects on receptors within the SPA that are sensitive to changes in water quality.

The SCIs of the Donegal Bay SPA are:

- [A003] Great Northern Diver (*Gavia immer*);
- [A046] Light-bellied Brent Goose (*Branta bernicla hrota*);
- [A065] Common Scoter (*Melanitta nigra*);
- [A144] Sanderling (*Calidris alba*); and,
- [A999] Wetlands.

Proposed accommodations along the TDR will take place during the construction and decommissioning phase to facilitate the delivery of abnormal indivisible loads. No proposed accommodations are scheduled along the TDR during the operational phase.

5.1.1.7.1 [A003] Great Northern Diver (*Gavia immer*)

Donegal Bay SPA hosts an internationally important wintering population of Great northern diver and is consistently one of the top sites in the country for this species (NPWS, 2010b). No records of Great northern diver exist within 1km of POI 53 (AASR, Table 10).

Great northern diver is known to exhibit a medium to high sensitivity to disturbance during the non-breeding season, with reported disturbance distances ranging from approximately 100m to 350m, depending on the nature and intensity of the stimulus (Goodship and Furness, 2022). Frequent disturbance events have the potential to lead to energetic expenditure with potential for adverse effects on overwinter survival for the species (Goodship and Furness, 2022). POI 53 is located approximately 300m from the boundary of the SPA at nearest distance, which puts SPA within the potential Zol for the proposed accommodations.

Along Irish coastal waters, during the nonbreeding season Great northern diver is tolerant of marine activity to within 10 to 20m, but some individuals showing a dive response at this distance (Gittings *et al.* 2015). Great northern diver is known to forage at piers, harbours and ferry terminals, close to human activity, which suggests the species can become tolerant of human disturbance (Goodship and Furness, 2022).

POI 53 is located along the N15, which is a busy national road. As such, it can be assumed that any Great northern divers roosting and/or foraging within 350m of the national road is accustomed to a baseline level of disturbance from traffic. Furthermore, a housing development provides ample screening between POI 53 and the section of the SPA, which is located within the potential Zol for disturbance events associated with the POI. This reduces the potential for a significant disturbance event associated with vegetation clearance at POI 53, to negligible.

There is no potential for POI 53 to result in a disturbance event for Great northern diver nor adverse effects on the overall integrity of Donegal Bay SPA in view of the conservation objectives.

Donegal Bay SPA contains extensive intertidal marine habitats which support good populations of macro-invertebrates which are important food items for Great northern diver (NPWS, 2010b). In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, effects associated with over sail and over run



areas required for the construction of the TDR, have the potential to result in the degradation of supporting marine habitats. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. This constitutes adverse effects on the attributes that determine the conservation condition of this SCI species, as presented in Table 8-7, namely;

- Population trend; and,
- Distribution.

In the absence of mitigation, the proposed accommodations at POI 53 **constitute potential for adverse effects on Great northern diver and the overall integrity of Donegal Bay SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.7.2 [A046] Light-bellied Brent Goose (*Branta bernicla hrota*)

This species is known to be highly sensitive to noise and visual disturbance, with reported disturbance distances ranging from approximately 105m to 205m, depending on the nature and intensity of the stimulus (Cutts *et al.*, 2013). In areas where Light-bellied brent geese are quarry species, the range at which they react to stimuli increases to 350m (Cutts *et al.*, 2013). As such, mitigation measures are generally advised if Light-bellied brent geese are within 400m of high-level visual disturbance (Cutts *et al.*, 2013). Due to the sensitivity of the species, they are unlikely to be found in areas with high levels of general disturbance (Cutts *et al.*, 2013). As the N15 provides a baseline level of disturbance from traffic, it is likely that Light-bellied brent geese do not forage and roost within 350m to 400m of POI 53.

At POI 53 the proposed clearance of vegetation and topsoil to facilitate the delivery of an abnormal indivisible loads along the TDR, is highly localised. No works will take place within the intertidal sand and mudflats as all proposed accommodations are restricted to the road network. Furthermore, the intervening housing development between POI 53 and the SPA provides effective screening to reduce the visual disturbance from accommodations to negligible.

There is no potential for disturbance events associated with POI 53 to result in adverse effects on Light-bellied brent geese nor the overall integrity of the Donegal Bay SPA in view of the conservation objectives.

This SPA contains extensive areas of intertidal flats which are biotope rich and provide an important food resource for herbivorous wildfowl, including Light-bellied brent geese (NPWS, 2010b). In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, effects associated with over sail and over run areas required for the construction of the TDR, have the potential to result in the degradation of supporting marine habitats. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. This constitutes adverse effects on the attributes that determine the conservation condition of this SCI species, as presented in Table 8-7, namely;

- Population trend; and,
- Distribution.



Such effects should they occur, could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect.

In the absence of mitigation, the proposed accommodations at POI 53 **constitute potential for adverse effects on Light-bellied brent geese and the overall integrity of Donegal Bay SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.7.3 [A065] Common Scoter (*Melanitta nigra*)

The species is known to exhibit high sensitivity to disturbance, with reported disturbance distances ranging from approximately 300m to 500m during the breeding season, depending on the nature and intensity of the stimulus (Goodship and Furness, 2022). Given the presence of the intervening housing development between POI 53 and the SPA, which provides effective screening of the proposed accommodations, the potential for a disturbance to Common scoter is considered negligible. Furthermore, there are no records of Common scoter within 1km of POI 53 (AASR, Table 10).

It follows then that there is **no potential for POI 53 to result in a disturbance event for Common scoter nor adverse effects on the overall integrity of Donegal Bay SPA in view of the conservation objectives**.

This SPA contains extensive intertidal and marine habitats which support good populations of macro-invertebrates and are important food items for Common scoter (NPWS, 2010b). In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, effects associated with over sail and over run areas required for the construction of the TDR, have the potential to result in the degradation of supporting marine habitats. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. This constitutes adverse effects on the attributes that determine the conservation condition of this SCI species, as presented in Table 8-7, namely;

- Population trend; and,
- Distribution.

In the absence of mitigation, the proposed accommodations at POI 53 **constitute potential for adverse effects on Common scoter and the overall integrity of Donegal Bay SPA in view of the conservation objectives**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.7.4 [A144] Sanderling (*Calidris alba*)

Sanderling is considered extremely tolerant of human disturbance and construction activity, with reported disturbance distances ranging from approximately 6m to 50m depending on the type of stimulus (Cutts *et al.*, 2013). As the nearest proposed accommodations at POI 53 are located approximately 300m from the SPA. It follows then that, there is no potential for Sanderling to experience disturbance or displacement effects arising from the Proposed Project.



It follows then that there is **no potential for POI 53 to result in a disturbance event for Sanderling nor adverse effects on the overall integrity of Donegal Bay SPA in view of the conservation objectives.**

This SPA contains intertidal flats and extensive stretches of sandy beaches, which provide an important food resource for Sanderling (NPWS, 2010b). In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution, effects associated with over sail and over run areas required for the construction of the TDR, have the potential to result in the degradation of supporting marine habitats. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the SCI species within the SPA. This constitutes adverse effects on the attributes that determine the conservation condition of this SCI species, as presented in Table 8-7, namely;

- Population trend; and,
- Distribution.

In the absence of mitigation, the proposed accommodations at POI 53 **constitute potential for adverse effects on the integrity of Donegal Bay SPA in view of the conservation objectives for Sanderling**, as a result of siltation and/or contamination during the construction and decommissioning phases of the Proposed Project.

5.1.1.7.5 [A999] Wetlands

Donegal Bay SPA is a very large, marine-dominated, site. The site includes the estuary of the River Eske, which flows through Donegal Town, and the estuary of the River Erne, which flows through Ballyshannon. Much of the shoreline is rocky or stony, with well-developed littoral reefs in places. There are also extensive stretches of sandy beaches. Shingle or cobble beaches are also represented. There are extensive areas of intertidal flats associated with the estuary of the River Eske, reflecting the very sheltered conditions in this part of the bay. These have been shown to be biotope rich and supporting a range of macro-invertebrates. Elsewhere, a narrow fringe of intertidal flats is exposed at low tides. Salt marshes are found in the sheltered conditions of the innermost part of the bay. The waters of the shallow bay overlie mostly sandy substrates, though reefs occur in places (NPWS, 2010b).

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated with over sail and over run areas required for the construction of the TDR, have the potential to adversely affect the attributes that determine the conservation condition of this QI habitat, as presented in Table 8-7, namely;

- Habitat area.

Such effects could lead to a reduction in the area of these habitats and, if this were to occur during the construction and decommissioning phases of the Proposed Project, **would constitute an adverse effect on the integrity of the affected European site in view of the conservation objectives.**

5.1.1.8 Drumcliff Bay SPA

Proposed accommodations associated with the over sail areas at POI 55 along the TDR, will involve the temporary clearing any obstructions (road signage) to allow over sail of the blades along the N15. No vegetation clearance is necessary at this location. As Drumcliff Bay SPA is in



close proximity to POI 55 (c. 250 m), potential exists for adverse effects on SCI species within the SPA that are sensitive to disturbance.

As such, potential exists for adverse effects on receptors within the SPA that are sensitive to disturbance. The SCIs of the Drumcliff Bay SPA are:

- [A144] Sanderling (*Calidris alba*);
- [A157] Bar-tailed godwit (*Limosa lapponica*);

Proposed accommodations along the TDR will take place during the construction and decommissioning phase to facilitate the delivery of abnormal indivisible loads.

5.1.1.8.1 [A144] Sanderling (*Calidris alba*)

Sanderling is generally tolerant of human disturbance and construction activity, with reported disturbance distances ranging from approximately 6m to 50m depending on the type of stimulus (Cutts *et al.*, 2013). As the nearest accommodation area is POI 55, located approximately 250m from the SPA, there is no potential for Sanderling to experience disturbance or displacement effects arising from the Proposed Project (Table 8-8).

It follows then that there is **no potential for POI 55 to result in a disturbance event for Sanderling nor adverse effects on the overall integrity of Drumcliff Bay SPA in view of the conservation objectives.**

5.1.1.8.2 [A157] Bar-tailed Godwit (*Limosa lapponica*)

This species exhibits a moderate tolerance to human disturbance and construction activity, with reported disturbance distances ranging from approximately 40 m to 100 m before flushing (Cutts *et al.*, 2013). The species is known to rapidly abandon areas with high baseline disturbance in favour of quitter foraging and roosting sites (Cutts *et al.*, 2013). High baseline levels of disturbance can be assumed along the N15 and at POI 55, due to heavy traffic along the national road network. As such, it is unlikely the species will be regularly foraging within 200-300m of this location due to the high levels of traffic at the bridge over the Drumcliff River (WFD river waterbody Drumcliff_020), as well as the busy carpark for the Davis' Restaurant & Yeats Tavern located c. 15m from the boundary of the SPA. Furthermore, the intervening housing and Scrub (WS1) habitat between POI 55 and the SPA likely provides effective screening to prevent a significant disturbance event (Table 8-8).

It follows then that there is **no potential for POI 55 to result in a disturbance event for Bar-tailed godwit nor adverse effects on the overall integrity of Drumcliff Bay SPA in view of the conservation objectives.**

5.1.1.9 Glenade Lough SAC

The construction phase of the proposed Wind Farm Site, specifically the site excavations along the western site entrance towards the nearby substation and construction compound as well as the turbine hardstand at T11, constitute a source of potential contamination of the Glencar GWB. Karstification is extensive throughout the Glencar GWB (GSI, 2004b). As the Glencar GWB also encompass Glenade Lough SAC, this constitutes potential for adverse effects on groundwater dependent receptors within the SAC.

Site excavations will increase the vulnerability of the underlying aquifer to pollution through either a complete loss of overburden where cuttings are into the bedrock or by reducing the



overburden depth and thus increasing the vulnerability for contaminated drainage (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4). Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table and the attenuating capacity of the geological deposits through which the water travels (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4).

The Glencar GWB at the western site entrance is considered to have extreme and high vulnerability (Figure 5). The groundwater vulnerability of the Glencar GWB at T11 and the nearby substation is considered moderate. At the nearby construction compound groundwater vulnerability is considered low.

Groundwater flow through karst areas is extremely complex and difficult to predict (GSI, 2004b). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (GSI, 2004b). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (GSI, 2004b).

Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.4.5.2). Dewatering to accommodate construction activities at T11 has potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats, which constitutes a potential for adverse effects on the QI habitats if Glenade Lough SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.

As such, there is potential for adverse effects on the QI habitats and species for Glenade Lough SAC which are groundwater dependent as a result of alterations to groundwater quality, flow, and drawdown during the construction phase of the Proposed Project, namely (NPWS, 2016c);

- 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation;
- 1092 White-clawed crayfish; and
- 1833 Slender naiad.

No dewatering or site excavations will take place during the operational and decommissioning phase.

5.1.1.9.1 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation

Glenade Lough SAC is suffering from eutrophication which is leading to changes in vegetation composition (NPWS, 2021b). Pollution of groundwater from various activities including agricultural, forestry, residential and commercial are all listed as identified threats/pressures to the Annex I habitat type (NPWS, 2025e).

In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the conservation objectives for the Annex I habitat type within the SAC, if contaminated groundwater was to discharge into the lake. Similarly, dewatering at T11 has potential to lead to changes in groundwater flow and/or drawdown of the water table constituting potential for adverse effects on the conservation objectives for the Annex I habitat type within the SAC. Potential for



adverse effects on several of the attributes which define the conservation objectives of the Annex I habitat type 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation, are detailed in Table 8-9, namely;

- Habitat distribution;
- Vegetation composition: species richness;
- Vegetation composition: typical species;
- Vegetation distribution: maximum depth;
- Vegetation distribution: characteristic zonation;
- Vegetation distribution: maximum (eutrophic) depth;
- Hydrological regime: water level fluctuations
- Dissolved organic carbon (DOC);
- Transparency;
- Attached algal biomass; and,
- Fringing habitat: area and condition.

In the absence of mitigation, contamination of the Glencar GWB from site excavation works at T11, the western site entrance, and nearby substation, and construction compound, as well as dewatering at T11 all constitute potential for **adverse effects on the integrity of Glenade Lough SAC** during the construction phase of the Proposed Project, by undermining the conservation objectives for the Annex I habitat type 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation.

5.1.1.9.2 [1833] Slender Naiad *Najas flexilis*

The Annex II species Slender Naiad (*Najas flexilis*) has not been seen at Glenade Lough since 1978 and is considered locally extinct (NPWS, 2021b). It is a delicate aquatic plant with specific environmental requirements and is associated with the Annex I habitat type 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae (NPWS, 2025e). Groundwater contamination from agriculture, forestry, and commercial activities are listed as threats/pressures to the species (NPWS, 2025e).

In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the conservation objectives for the Annex II species within the SAC, if contaminated groundwater was to discharge into the lake. Similarly, dewatering at T11 has potential to lead to changes in groundwater flow and/or drawdown of the water table constituting potential for adverse effects on the conservation objectives for the Annex II species within the SAC. Potential for adverse effects on several of the attributes which define the conservation objectives of the Annex II species Slender Naiad (*Najas flexilis*), are detailed in Table 8-9, namely;

- Population extent;
- Population depth;
- Population viability;
- Population abundance;
- Species distribution;



- Habitat extent;
- Hydrological regime: water level fluctuations;
- Vegetation distribution: maximum (euphotic) depth;
- Hydrological regime: water level fluctuations;
- Dissolved organic carbon (DOC);
- Associated species; and,
- Fringing habitat: area and condition.

In the absence of mitigation, contamination of the Glencar GWB from site excavation works at T11, the western site entrance, and nearby substation, and construction compound, as well as dewatering at T11, all constitute potential for **adverse effects on the integrity of Glenade Lough SAC** during the construction phase of the Proposed Project, by undermining the conservation objectives for the Annex II species 1833 Slender Naiad *Najas flexilis*.

5.1.1.9.3 [1092] White clawed crayfish

All existing records of white-clawed crayfish have come from the accessible eastern shoreline of Glenade Lough SAC in the 1km square G8345, which is c. 7.7km north-west of the proposed Wind Farm Site at nearest distance (NPWS, 2021b). However, it is assumed the species is present elsewhere in the lake (NPWS, 2021b).

In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the attributes for the Annex II species within the SAC, if contaminated groundwater was to discharge at these locations as detailed in Table 8-9, namely;

- Distribution;
- Population structure: recruitment;
- Population size;
- Water quality; and,
- Habitat quality: heterogeneity.

In the absence of mitigation, contamination of the Glencar GWB from site excavations constitutes potential for **adverse effects on the integrity of Glenade Lough SAC** by undermining the conservation objectives for the Annex II species 1092 White-clawed crayfish.

5.1.1.10 Lough Derg (Donegal) SPA

Lough Derg (Donegal) SPA [004057] is located c. 31km north-east of the proposed Wind Farm Site. The SPA is designated for two SCIs, namely (NPWS, 2012a);

- A183 Lesser Black-backed Gull (*Larus fuscus*)
- A184 Herring Gull (*Larus argentatus*)

Both lesser black-backed gull and herring gull were recorded at the proposed Wind Farm Site during field surveys, but with no evidence of territory holding, foraging or roosting during the breeding season.



5.1.1.10.1 [A183] Lesser Black-backed Gull

Lesser black-backed gull is an opportunistic feeder, foraging both terrestrial and aquatic habitats. The maximum recorded foraging distance from nesting sites for Lesser black-backed gull is 553km (NPWS, 2025h). The overall mean foraging distance for the species is 43km, which puts Lough Derg SPA within the potential ZOI for the proposed Wind Farm Site for mean foraging distances during the breeding season, which is located c. 31km away (NPWS, 2025h).

Peak counts of Lesser black-backed gull represent <1% of the ROI population (TOBIN, 2026, see Appendix 6: EIAR Chapter 6 – Ornithology). Flight activity levels were reasonably high throughout the study period (>10,000 seconds) but were based on low numbers of observations, being recorded during the breeding season only, with a mean of c. 27 observations per breeding season (10, 15, 26 and 57 times in the B21, B22, B23 and B24 seasons respectively). No breeding was confirmed on-site, and all records reflected commuting birds rather than foraging or roosting individuals. Based on this evidence, a potential collision risk pathway exists for the species.

Collision Risk has potential to undermine the Conservation Objectives for Lesser black-backed gull and Herring gull by under mining the following attributes as listed in Table 8-10;

- Forage spatial distribution, extent, abundance and availability; and,
- Barriers to connectivity.

However, the Conservation Objectives for Lough Derg (Donegal) SPA clearly state that no breeding pairs of Lesser black-backed gull have not been identified during surveys at Lough Derg (Donegal) SPA since 1999. It has been suggested that the closure of a nearby landfill lead the breeding colony to abandon the site (NPWS, 2025h). Local populations can scavenge on landfills and become dependent on such for food.

The birds observed at the proposed Wind Farm Site were observed during the breeding season only. Therefore, there is no functional link between the SPA population of Lesser Black-backed gull and those observed commuting across the proposed Wind Farm Site.

It follows then, that there is **no potential for the proposed Wind Farm Site to result in adverse effects** on the integrity of Lough Derg (Donegal) SPA, or the SCI species Lesser black-backed gull in view of the conservation objectives.

5.1.1.10.2 [A184] Herring Gull (*Larus argentatus*)

Herring gull is an opportunistic feeder, foraging both terrestrial and aquatic habitats (NPWS, 2025h). The maximum recorded foraging distance from nesting sites for Herring gull is 92km with an overall mean foraging distance of 15km from breeding site (NPWS, 2025h). These distances put Lough Derg SPA within the potential ZOI for the proposed Wind Farm Site, which is located c. 31km away.

Peak count of Herring gull in the breeding season represents <1% of the ROI population (TOBIN, 2026, see Appendix 6: EIAR Chapter 6 – Ornithology). The species was recorded 4 times (B23 season only) across all survey types combined, reflecting occasional commuting flights only. No confirmed breeding or functional usage of the proposed Wind Farm Site was identified. Based on this evidence, a potential collision pathway for significant effects exists.

Collision Risk has potential to undermine the Conservation Objectives for Lesser black-backed gull and Herring gull by under mining the following attributes as listed in Table 8-10;



- Forage spatial distribution, extent, abundance and availability; and,
- Barriers to connectivity.

These distances put Lough Derg SPA within the potential ZoI for the proposed Wind Farm Site, which is located c. 31km away.

However, the Conservation Objectives for Lough Derg (Donegal) SPA clearly state that no breeding pairs of Herring gull have not been identified during surveys at Lough Derg (Donegal) SPA since 1999. It has been suggested that the closure of a nearby landfall lead the breeding colony to abandon the site (NPWS, 2025h). Local populations can scavenge on landfills and become dependent on such for food.

The birds observed at the proposed Wind Farm Site were observed during the breeding season only. Therefore, there is no functional link between the SPA population of Herring gull and those observed commuting across the proposed Wind Farm Site.

It follows then, that there is **no potential for the proposed Wind Farm Site to result in adverse effects** on the integrity of Lough Derg (Donegal) SPA, or the SCI species Herring gull in view of the conservation objectives.

5.1.1.11 Lough Gill SAC

Lough Gill SAC [001976] is located c. 165m south of the Application Site Boundary for the proposed Wind Farm Site (Figure 8). A summary of the potential for adverse effects is provided below.

Habitat Loss

At HDD Site 1, the GCR deviates from the public road L-2136 for c. 178m and crosses the Bonet River (EPA Code: 35B06) which is part of the WFD Bonet_030 river waterbody. The proposed temporary launch pits for HDD site 1 at Aquatic Site 15, involves the removal of c. 10m of (WL1) Hedgerow within the boundaries of Lough Gill SAC as well as 0.01ha of (Mixed) broadleaved woodland (WD1) outside of Lough Gill SAC (Figure 10). There will be no loss of QI habitat within the SAC. As such, **there is no potential for adverse effects on QI habitats, in light of their conservation objectives, or the overall integrity of Lough Gill SAC** as a direct loss of habitat. This Hedgerow (WL1) habitat may be of value for commuting and/or resting European otter, which is a QI species for the SAC (Section 5.1.1.11.8).

Groundwater

The proposed Wind Farm Site is partially located within the Killarga South GWB and shares this groundwater body with the northern extent of the boundaries of Lough Gill SAC along the Owenmore (Manorhamilton)_020 (Figure 4).

The Killarga South GWB is a karstified aquifer. Groundwater flow through karst areas is extremely complex and difficult to predict (GSI, 2004c). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (GSI, 2004c). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (GSI, 2004c). This constitutes potential for adverse effects on ground water dependant QI habitats through groundwater contamination associated with site excavation works at T2, T6, T5, T7, T8, T10, T13 and T14 as well as the borrow pits to the north and south of the proposed Wind Farm Site.



Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology, Section 8.4.5.2). Dewatering to accommodate construction activities within the Killarga South GWB at T2, T6, T5, T7, T8, T10, T13 and T14 as well as the borrow pits to the north and south of the proposed Wind Farm Site, has potential to cause measurable drawdown of groundwater. This constitutes a potential for adverse effects on the hydrological regime of groundwater dependant QI habitats.

Groundwater vulnerability is *extreme to high* at T14 and the borrow pit to the south. Groundwater vulnerability is *high* at T2, T7, T8, T13. Groundwater vulnerability is *moderate* at T5, T6, T10 and the borrow pit to the north.

However, the location of these groundwater dependant Annex I habitats within the SAC are located within separate groundwater bodies (NPWS, 2021f). Lough Gill itself is designated Annex I habitat type 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation. It is located c. 12.5km south west of the proposed Wind Farm Site, within the Carrowmore East GWB and Dromahair GWB (Figure 11). The Annex I habitat type 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*, is located on the north-western shore of Lough Gill along the Garavogue_010, which lies within the Carrowmore East GWB c. 20km from the proposed Wind Farm Site. A small parcel of the habitat is located along the Bonet River within the GWB. In summary, **there is no potential for adverse effects on the groundwater dependant habitats of Lough Gill SAC**, namely (NPWS, 2016b);

- 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation; and,
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*

Surface Water

The proposed Wind Farm Site is upstream and hydrologically connected to the SAC via the Brackary_010 and Owenmore (Manorhamilton)_020 (Figure 12). There is potential for negative impacts on Lough Gill SAC including the release of sediment laden surface water or otherwise polluted water to watercourses draining from the proposed Wind Farm Site.

Sections of the proposed GCR are located within the boundary of Lough Gill SAC for c. 920m. The trenching of the cable within the public road network includes six existing watercourse crossings (Aquatic site 15, 16, 17, 19, 22, 24) within the SAC along the Bonet River (Figure 9), with an additional eight existing watercourse crossing outside of the SAC boundary which drain into Lough Gill SAC (Aquatic site 12, 13, 14, 18,20, 21, 26, 27) (Figure 9). Any trenching within 50m of a watercourse has potential to result in siltation and/or contamination of watercourses.

No site excavations within the proposed Wind Farm Site are scheduled during the operational and decommissioning phase of the Proposed Project. The hardstands and internal access tracks will be left in-situ. As such, adverse effects associated with siltation/contamination of downstream watercourses will be limited to the construction phase of the Proposed Project. There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.



Disturbance to QI species

European otter is at risk of disturbance from construction activities and habitat loss along the GCR during the construction phase. No European otter holts, breeding or resting places were identified during field surveys along the proposed GCR (see Appropriate Assessment Screening Report, Section 4). However, the potential for disturbance to the species remains as newly established breeding and/or resting places may be identified within 150m of proposed works along the GCR during pre-construction confirmatory surveys. The potential for adverse effects on the conservation objectives of the QI species are discussed further in Section 5.1.1.11.8.

There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.

Invasive Alien Species

There is potential for the transmission of IAS into Lough Gill SAC network during the construction phase of the GCR, as the GCR passes within the boundaries of the SAC at 4 locations along the public roads. In this way, construction activities along the GCR has the potential to lead to further spread of these IAS within the boundaries of Lough Gill SAC constituting **adverse effects on the integrity of Lough Gill SAC**.

Three identified IAS species are listed on the Third Schedule (S.I. No. 477/2011) as amended, and subject to legal restrictions under Regulations 49 and 50. The species consist of:

- Japanese Knotweed (*Fallopia japonica*) (Figure 13-Figure 15),
- Himalayan balsam (*Impatiens glandulifera*) (Figure 16); and,
- Rhododendron (*Rhododendron ponticum*) (Figure 17 and Figure 18).

Summary

As such, there is potential for adverse effects on the integrity of Lough Gill SAC during the construction phase, by undermining the conservation objectives for QI species, which are listed in Table 8-11, namely (NPWS, 2016b):

- 3150 Natural eutrophic lakes with *Magnopotamionor Hydrocharition*- type vegetation;
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae);
- 1092 White-clawed Crayfish;
- 1095 Sea Lamprey;
- 1096 Brook Lamprey;
- 1099 River Lamprey;
- 1106 Atlantic Salmon ; and,
- 1355 European otter.

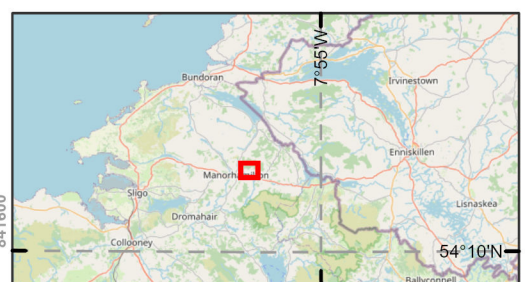
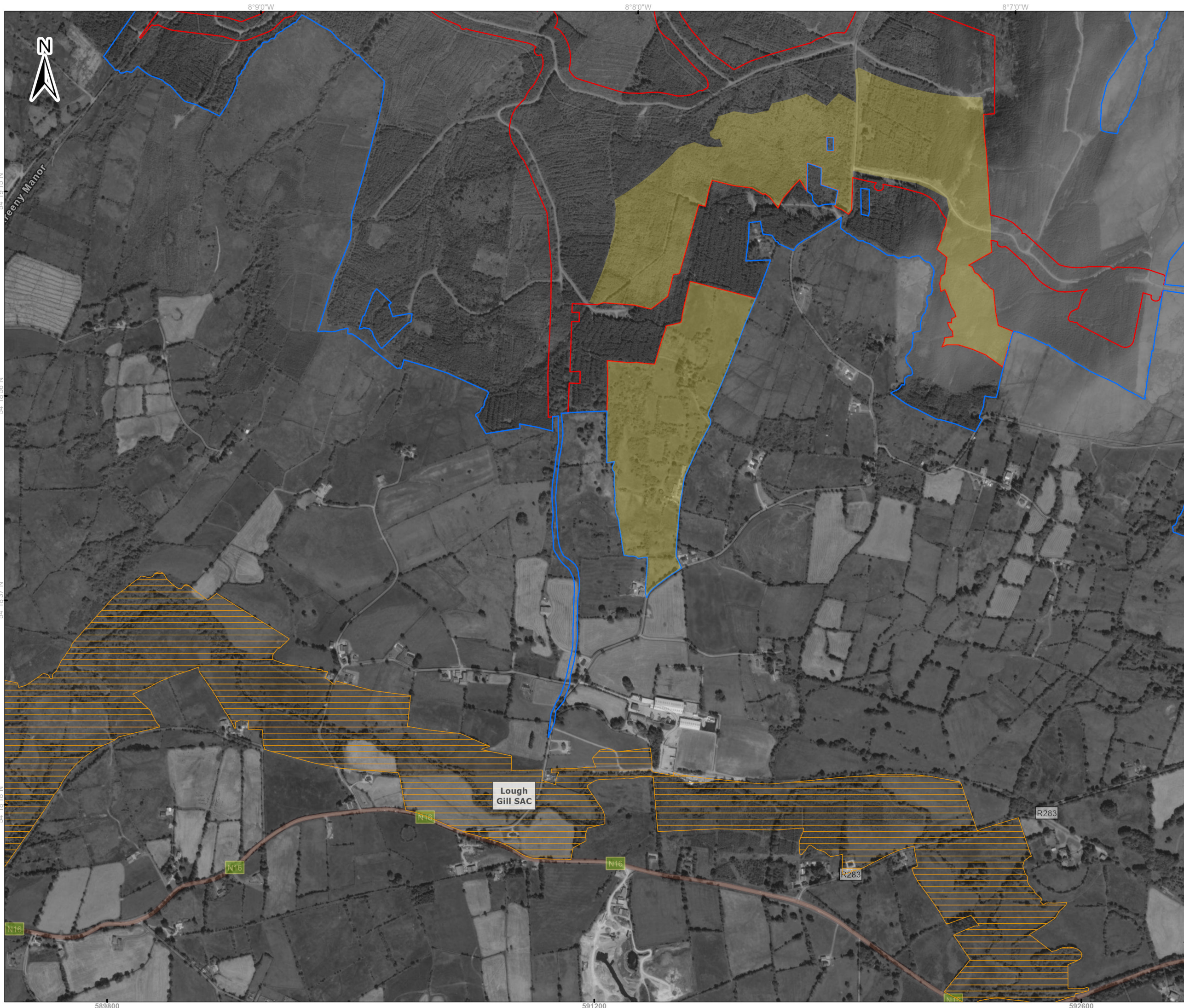
In addition, the presence of IAS along the GCR constitutes potential for **adverse effects on the integrity of Lough Gill SAC**.

No site excavations within the proposed Wind Farm Site are scheduled during the operational and decommissioning phase of the Proposed Project. The hardstands and internal access

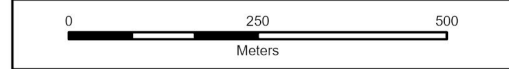


tracks will be left in-situ. As such, adverse effects associated with siltation/contamination of downstream watercourses will be limited to the construction phase of the Proposed Project. There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.





- Legend**
- proposed Wind Farm Site
 - Survey Area of the proposed Wind Farm Site
 - Enhancement lands
 - Special Areas of Conservation (SACs)



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A	19/02/2026	First issue	S.P	S.R

Client: **FuturEnergy Ireland**

Project: **Lissinagroagh Wind Farm**

Title: **Figure 8:
Lough Gill SAC and the southern entrance to the proposed Wind Farm Site**

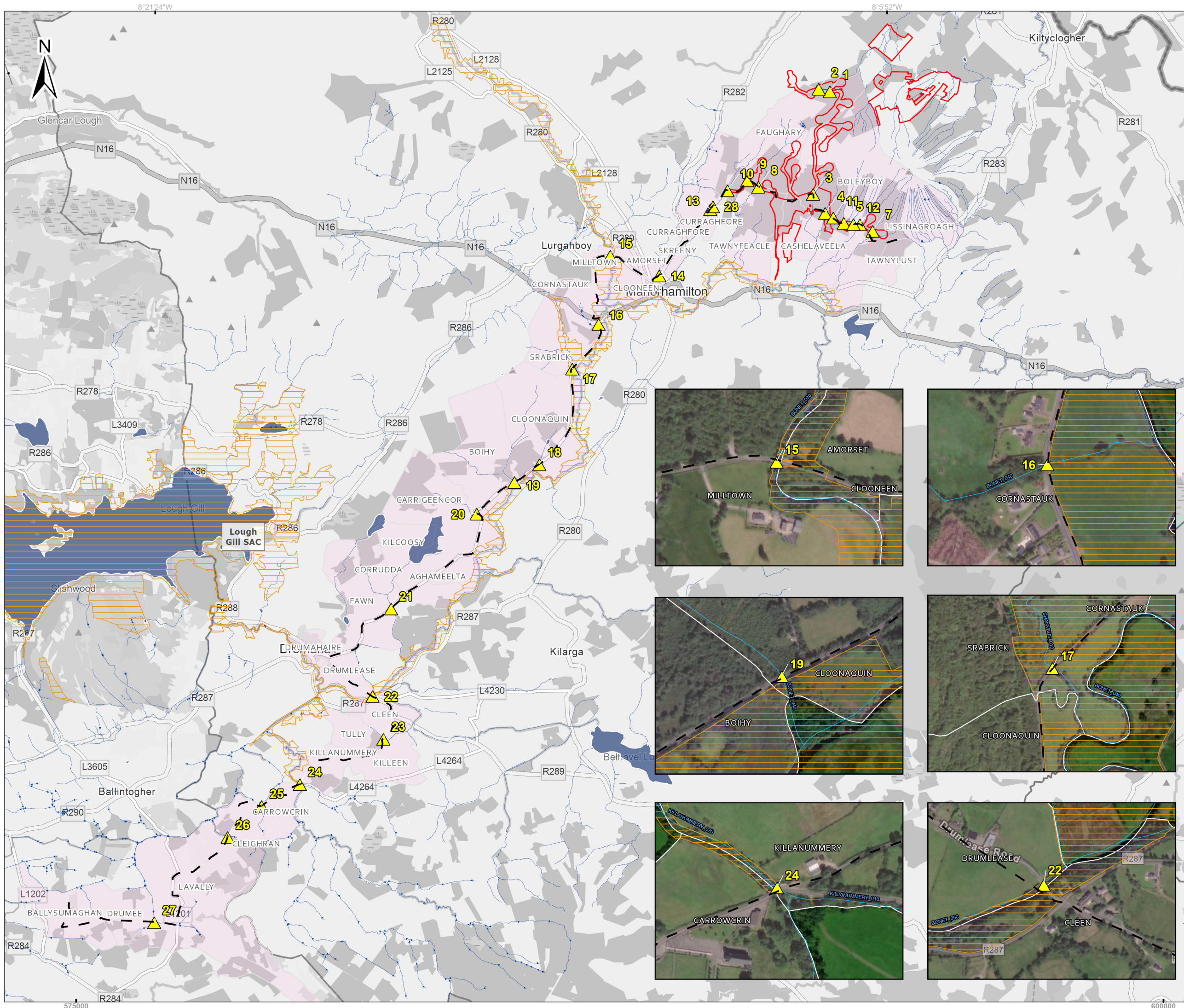
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Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

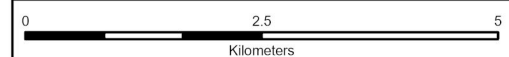
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- Legend**
- proposed Wind Farm Site
 - Grid Connection Route
 - ▲ Aquatic Survey Locations
 - WFD - River Water Bodies
 - WFD - Lake Water Bodies
 - WFD - Transitional Water Bodies
 - Lough Gill SAC
 - Townland Boundaries



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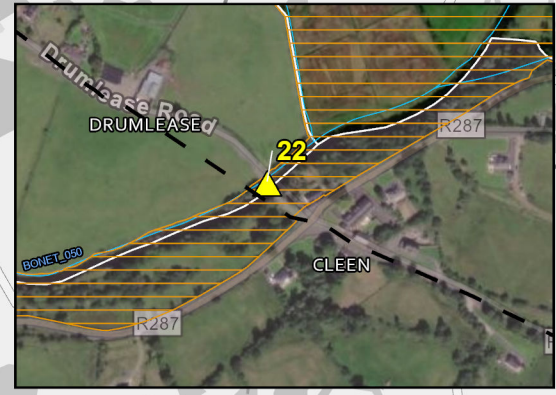
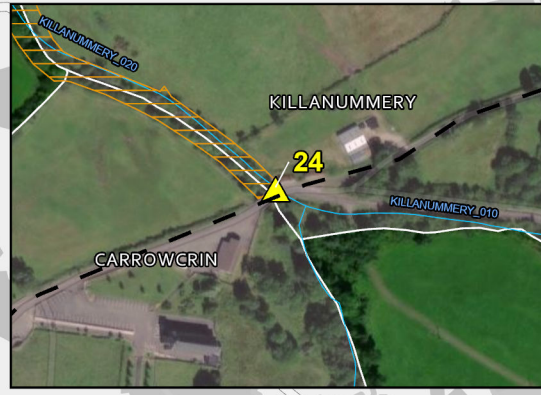
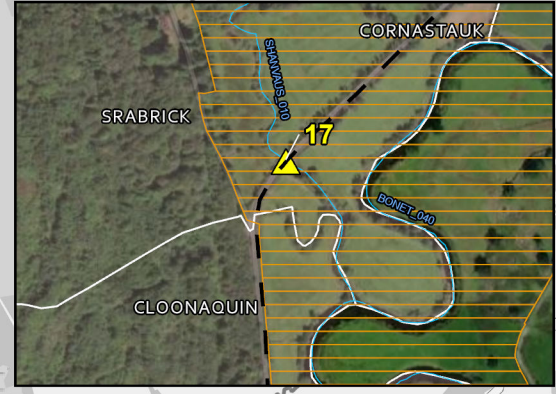
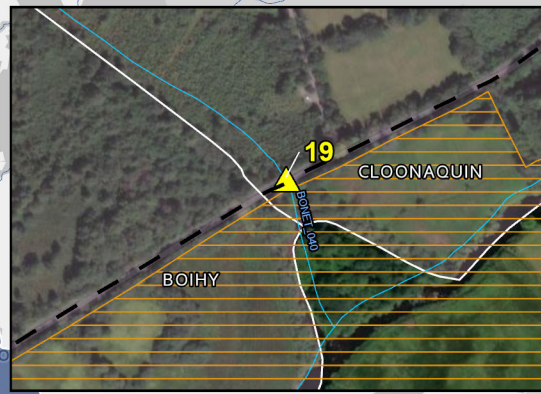
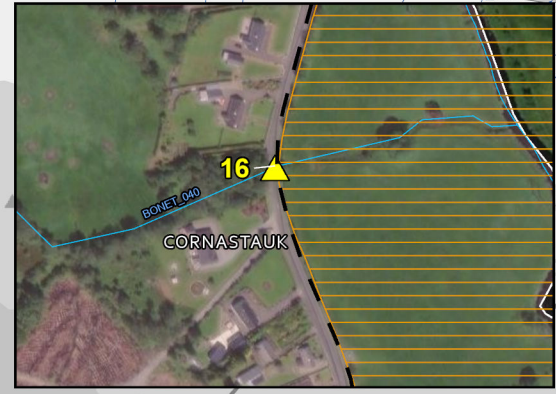
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 Figure 9:
 Existing watercourse crossings along the Grid Connection Route and Aquatic Sites within the boundary of Lough Gill SAC

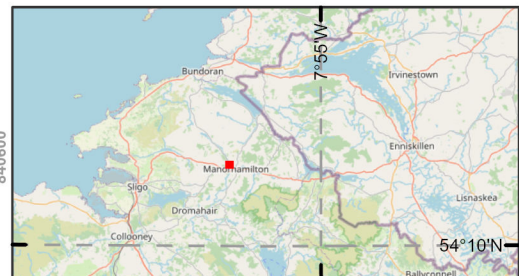
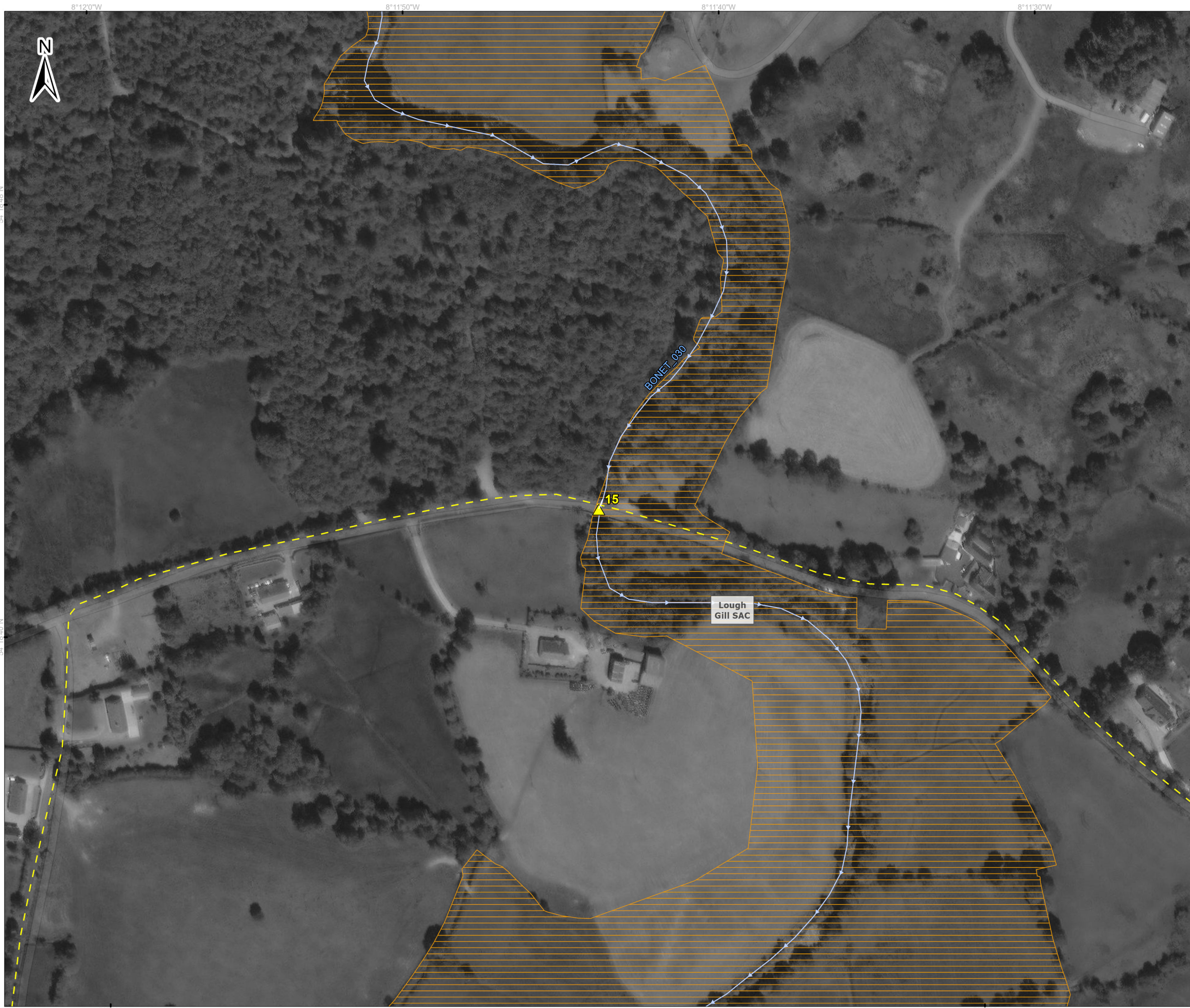
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 Prepared by: S.Pezzetta
 Checked by: S.Ryan
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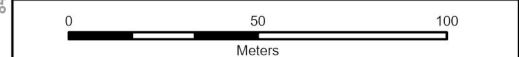
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 Draft: A





- Legend**
- Aquatic Survey Locations
 - Grid Connection Route
 - WFD - River Water Bodies
 - Special Areas of Conservation (SACs)



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Client:

Project:
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Title:
 Figure 10:
 Lough Gill SAC and
 proposed HDD Site 1

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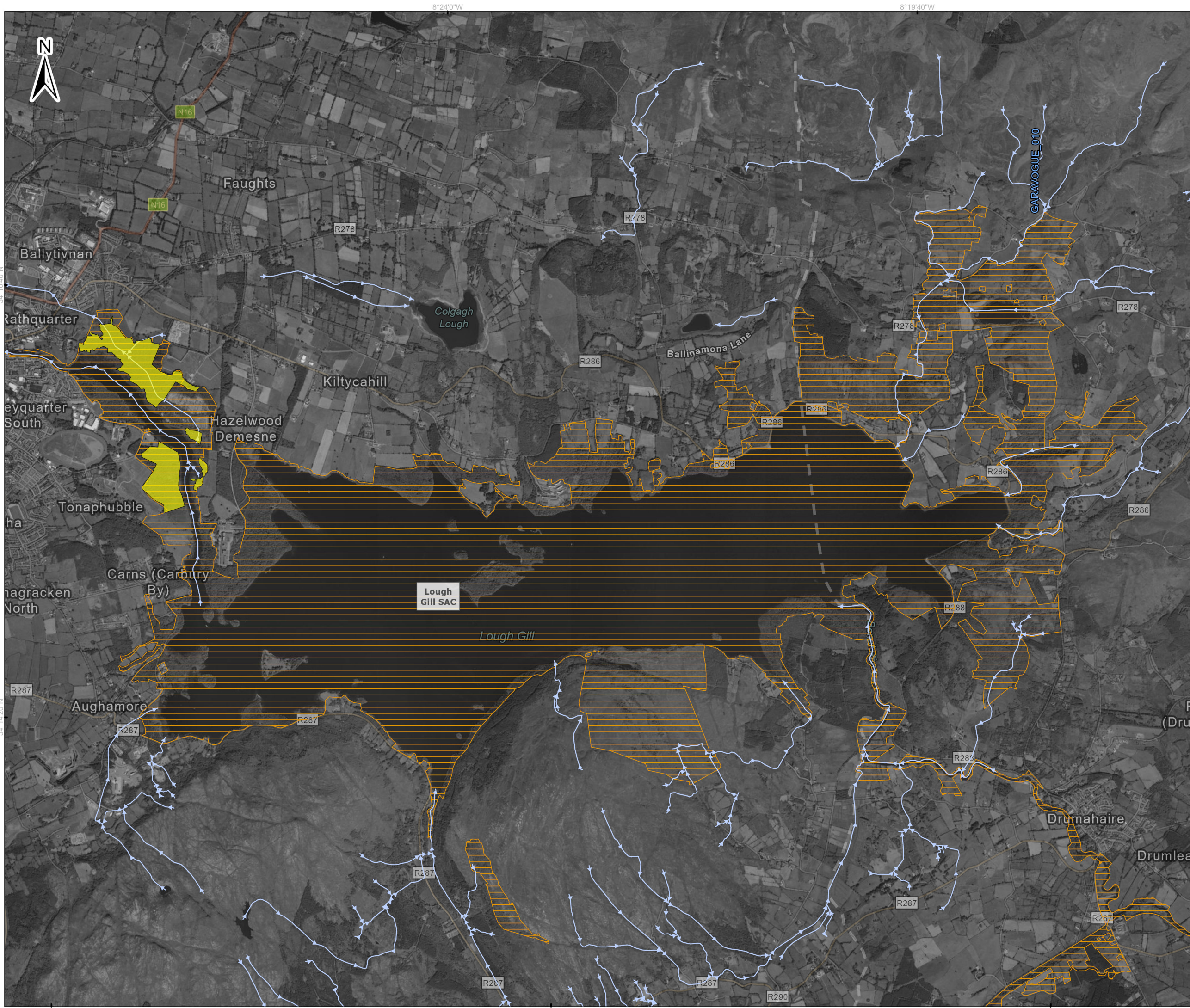
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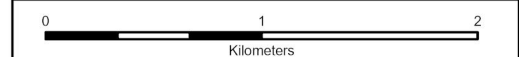
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840600 840400 840200

587000 587500



- Legend**
- Special Areas of Conservation (SACs)
 - WFD - River Water Bodies
 - Article 17 Annex I - Terrestrial Habitats
 - 910E Alluvial forests



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Title:
 Figure 11:
 Ground water dependent habitats in Lough Gill SAC

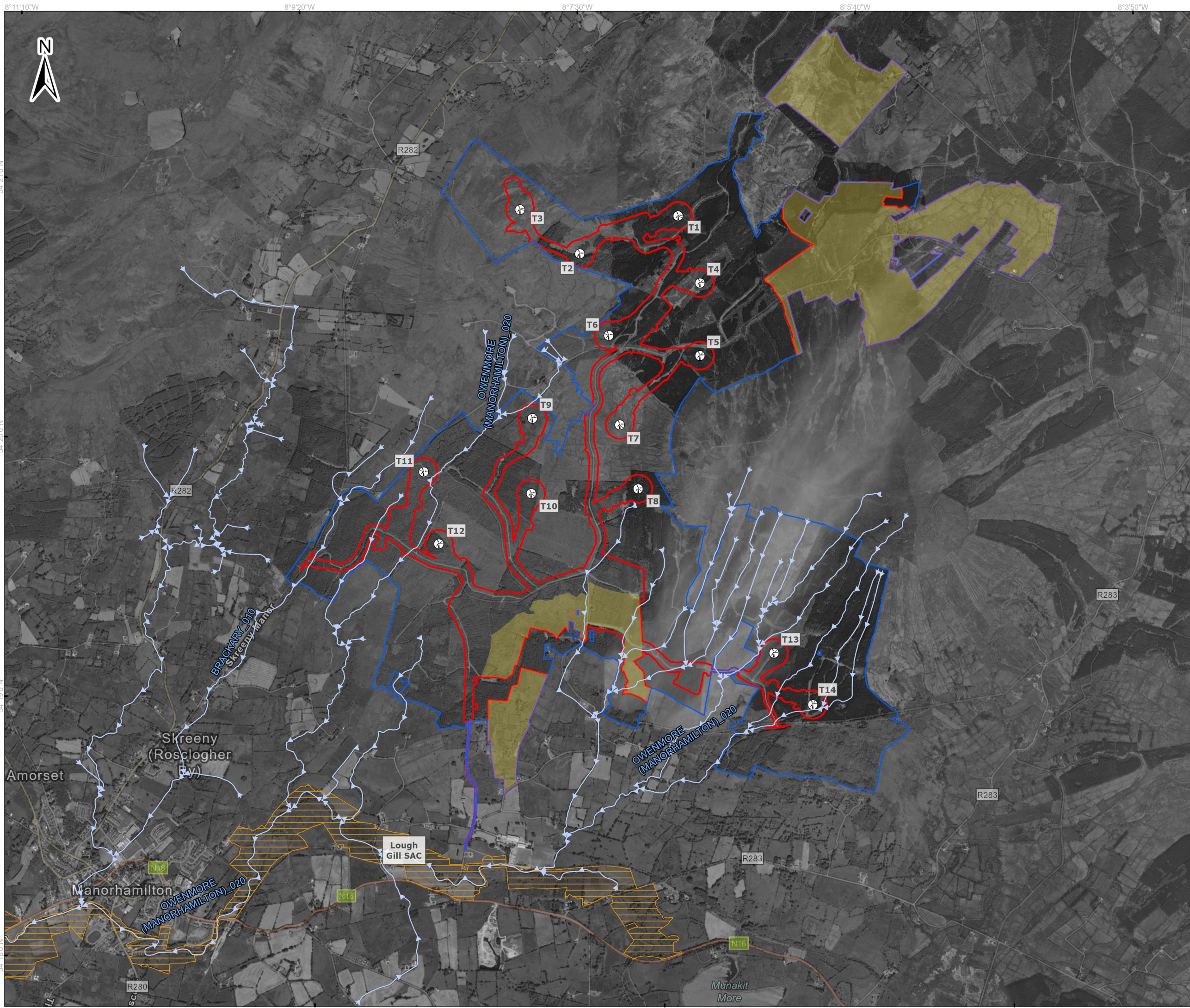
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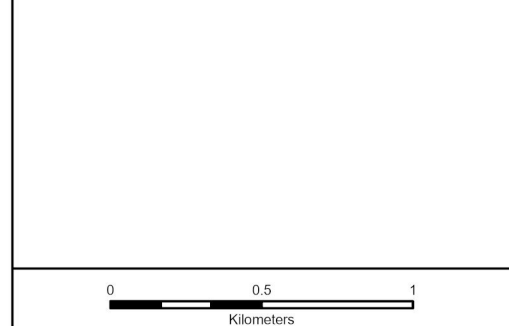
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- Legend**
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 - Survey Area of the proposed Wind Farm Site
 - Turbine Locations
 - Enhancement lands
 - Special Areas of Conservation (SACs)
 - WFD - River Water Bodies



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Title:
 Figure 12:
 Hydrological connectivity between
 the proposed Wind Farm Site
 and Lough Gill SAC

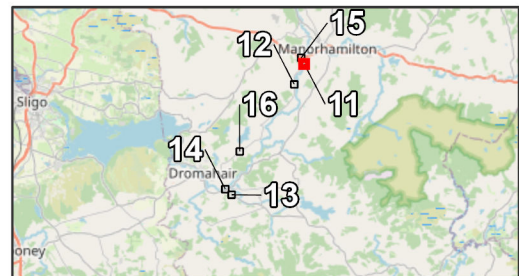
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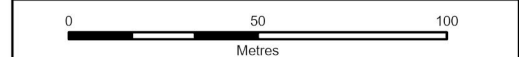
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- Legend**
- Grid Connection Route
 - ▲ Aquatic Survey Locations
 - Special Areas of Conservation (SACs)
- Invasive Species**
- Japanese Knotweed
 - Japanese Knotweed



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Client:

Project:
 Lissinagroagh Wind Farm

Title:
 Figure 13:
 Location of Japanese Knotweed
 (Fallopia japonica) along the Grid
 Connection Route south of Aquatic Site 16
 Sheet 1 of 6

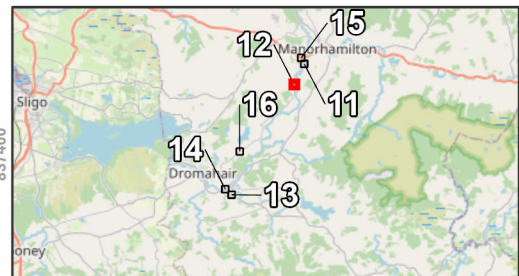
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Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

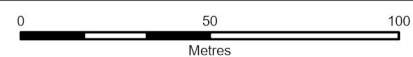
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- Legend**
- Grid Connection Route
 - Special Areas of Conservation (SACs)
- Invasive Species**
- Japanese Knotweed



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Client: **FuturEnergy** Ireland

Project: **Lissinagroagh Wind Farm**

Title: **Figure 14:
 Location of Japanese Knotweed
 (Fallopia japonica) along the Grid
 Connection Route south of Aquatic Site 17
 Sheet 2 of 6**

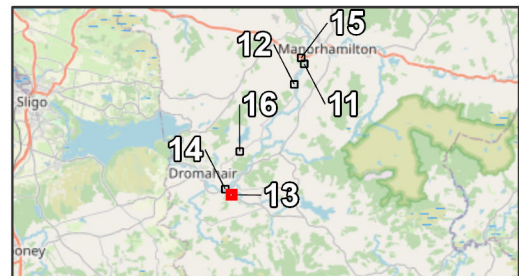
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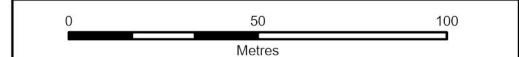
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Legend

- Grid Connection Route
- Invasive Species**
- Japanese Knotweed



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Project: **Lissinagroagh Wind Farm**

Title: **Figure 15:
 Location of Japanese Knotweed
 (Fallopia japonica) along the Grid
 Connection Route north of Aquatic Site 23
 Sheet 3 of 6**

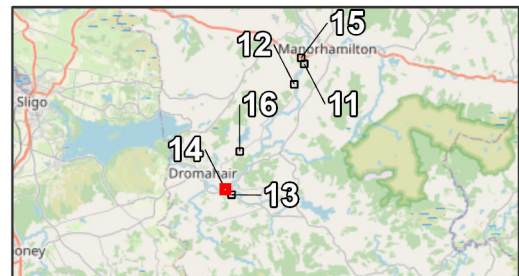
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Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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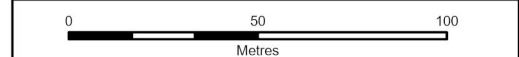
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- Legend**
- Grid Connection Route
 - ▲ Aquatic Survey Locations
 - Special Areas of Conservation (SACs)

- Invasive Species**
- Himalayan Balsam



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Project: **Lissinagroagh Wind Farm**

Title: **Figure 16:
 Location of Himalayan
 balsam along the Grid
 Connection Route at Aquatic Site 22
 Sheet 4 of 6**

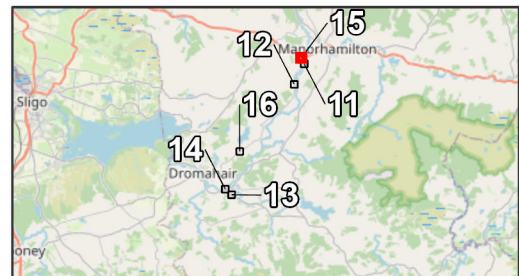
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- Legend**
- Grid Connection Route
 - ▲ Aquatic Survey Locations
 - Special Areas of Conservation (SACs)
- Invasive Species**
- Rhododendron



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Project: **Lissinagroagh Wind Farm**

Title: **Figure 17:
 Location of Rhododendron
 ponticum along the Grid
 Connection Route north-east of Aquatic Site 16
 Sheet 5 of 6**

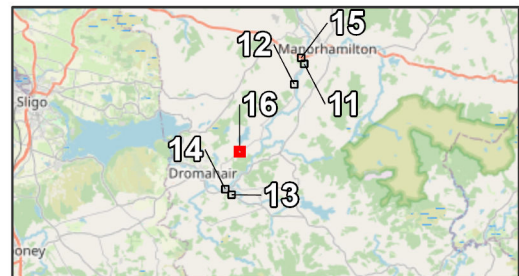
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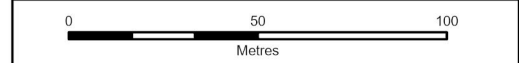
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Map Ref: 10955-014.NIS-INV..SP-GCR-TOB-A Draft: **A**



Legend

- Grid Connection Route
- Invasive Species**
- Rhododendron



Spatial Reference
 Datum: IRENET95
 EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	25/02/2026	First issue	S.P	S.R

Client: **FuturEnergy** Ireland

Project: **Lissinagroagh Wind Farm**

Title: **Figure 18:
 Location of Rhododendron
 ponticum along the Grid
 Connection Route north of Aquatic Site 21
 Sheet 6 of 6**

Scale @ A3: 1:2,000

Prepared by: S.Pezzetta Checked by: S.Ryan Date: February 2026

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5.1.1.11.1 [3150] Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.

Siltation and contamination of watercourses has potential to have adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation, as presented in Table 8-11, namely;

- Habitat area;
- Habitat distribution;
- Vegetation composition: species richness;
- Vegetation composition: typical species;
- Vegetation;
- composition: characteristic zonation;
- Vegetation distribution: maximum depth;
- Transparency;
- Phytoplankton biomass;
- Phytoplankton composition;
- Attached algal biomass;
- Macrophyte status;
- Acidification status;
- Water colour;
- Dissolved organic carbon (DOC);
- Turbidity; and
- Fringing habitat: area and condition

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project, by undermining the conservation condition of the Annex I habitat type 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation within the SAC.

5.1.1.11.2 [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

The area of the Annex I habitat type within the SAC is estimated to be 55.3ha (NPWS, 2021f). The habitat occurs along the Garavogue River, but this location is beyond the Zol of the Proposed Project as it is beyond the depositional water body Lough Gill (Figure 11). A parcel of the Annex I habitat type is located along the banks of the River Bonet at NPWS Site 371 (NPWS, 2021f).

Siltation and/or contamination of watercourses during the construction phase, either within the proposed Wind Farm Site or along the proposed GCR, constitutes a pathway for potential



adverse effects on the Annex I habitat type through the indirect mortality of vegetation. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type as presented in Table 8-11, namely;

- Habitat area;
- 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: veteran trees;
- Vegetation composition: native tree cover;
- Vegetation composition: typical species; and,
- Vegetation composition: negative indicator species.

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project by undermining the conservation condition of the Annex I habitat type [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) within the SAC.

5.1.1.11.3 [1092] White-clawed crayfish

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.

As such, in the absence of mitigation, there is potential for adverse effects on the Annex II species 1092 White-clawed crayfish within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the attributes which define the favourable conservation condition for the Annex II species as presented in Table 8-11, namely;

- Distribution;
- Population structure: recruitment;
- Population size;
- River water quality;
- Lake water quality; and

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project by undermining the conservation condition of the Annex II species 1092 White-clawed crayfish within the SAC.

5.1.1.11.4 [1095] Sea Lamprey

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.



Siltation and contamination of watercourses has the potential to have adverse effects on one attribute which determines the conservation condition of the Annex II species 1095 Sea lamprey within the SAC, as presented in Table 8-11, namely;

- Larval lamprey in fine sediment.

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project by undermining the conservation condition of the Annex II species 1095 Sea lamprey.

5.1.1.11.5 [1096] Brook Lamprey

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.

Siltation and contamination of watercourses has potential to have adverse effects several attributes which determine the conservation condition of the Annex II species 1096 Brook lamprey within the SAC, as presented in Table 8-11, namely;

- Population structure of larvae; and
- Larval lamprey in fine sediment.

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project by undermining the conservation condition of the Annex II species 1096 Brook lamprey.

5.1.1.11.6 [1099] River Lamprey

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.

Siltation and contamination of watercourses has potential to have adverse effects several attributes which determine the conservation condition of the Annex II species 1099 River lamprey within the SAC, as presented in Table 8-11, namely;

- Population structure of larvae; and
- Larval lamprey in fine sediment.

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project by undermining the conservation condition of the Annex II species 1099 River lamprey.

5.1.1.11.7 [1106] Atlantic Salmon

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.

Crisp (2000) notes that 'salmon spawning site selection is governed by complex environmental factors, which are all essential for successful spawning, egg survival and hatching, including intra-gravel flow, gravel size, water depth, as well as stream velocity and cover' and that 'one of the most important factors for salmon egg survival is oxygen supply, which is dependent upon



dissolved oxygen concentration and inter-gravel flow'. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material.

Siltation and contamination of watercourses has potential to have adverse effects on several attributes which determine the conservation condition of the Annex II species 1106 Atlantic salmon, as presented in Table 8-11, namely;

- Adult spawning fish;
- Salmon fry abundance;
- Salmon fry abundance;
- Number and distribution of redds;
- Water quality.

As such, in the absence of mitigation, there is potential for **adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project through undermining the conservation condition of the Annex II species 1106 Atlantic salmon.

5.1.1.11.8 [1355] European otter

Field surveys have confirmed European otter activity at Aquatic Site 15, 17, 19, and 22 which are located within the boundaries of Lough Gill SAC and along the proposed GCR.

A spraint site was identified under the bridge over the Shanvaus 35 (EPA 35S01, WFD Shanvaus_010), at Aquatic Site 17 with more than 25 spraints were identified (TOBIN, 2026, see Section 3.2.1.1). European otters are known to establish spraint sites under bridges to communicate territory (Reid et al. 2013). Four spraints were identified at Aquatic Site 15 over a 75m area along the banks of the Bonet (EPA: 35B06, WFD Bonet_030). This confirms European otter activity along the watercourse. Aquatic Site 15 corresponds to proposed HDD Site 1.

A spraint was also identified under a bridge at the Boihy (EPA 35B76, WFD Bonet_040) at Aquatic Site 19.

A spraint and crayfish remains were identified at Aquatic Site 22 where HDD Site 2 is proposed, confirming otter activity at this location.

Habitat Loss

The extent of terrestrial habitat for European otter is calculated using a standard 10m buffer around all waterbodies within the SAC, inclusive of rivers, lakes and ponds (NPWS, 2021f). One of the launch pits for HDD Site 1 (Aquatic Site 15) is located within the boundaries of the SAC, where c. 10m of Hedgerow (WL1) will be removed. This vegetation removal is >50m from the nearest watercourse (Bonet_030). As such, the loss of habitat will take place beyond the mapped extent of the terrestrial habitat for European otter. In summary, there is **no potential for adverse effects** on the integrity of the SAC as a result of a decline in the extent of terrestrial habitat for European otter.

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC.



Surface Water Quality

In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site as well as trenching/HDD along the GCR will likely lead to siltation/contamination of waterbodies within Lough Gill SAC. Siltation/contamination of waterbodies within the SAC constitutes **potential for adverse effects** by undermining the attributes which define the conservation objectives for the Annex II species as presented in Table 8-11, namely;

- Fish biomass available.

No site excavations are scheduled during the operational and decommissioning phase of the proposed Wind Farm Site. The hardstands and internal access tracks will be left in-situ. As such, adverse effects associated with siltation/contamination of downstream watercourses will be limited to the construction phase of the proposed Wind Farm Site. There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.

Disturbance/Displacement

No breeding/resting places for European otter were identified during field surveys along the proposed GCR. Nevertheless, there is potential for the identification of newly established breeding/resting places during pre-construction confirmatory surveys. Where, breeding/resting places are identified within 150m of where vegetation clearance will take place at HDD Site 1, there is **potential for adverse effects** by undermining the attributes which define the conservation objectives for the Annex II species as presented in Table 8-11, namely;

- Couching sites and holts.

Furthermore, impacts from construction related activities along the GCR namely noise, vibration, lighting, and human activity, have the potential to temporarily displace European otter, particularly during dawn and dusk when the species is most active. Construction activities along the GCR within 20-150m (NRA, 2008a) of watercourses within the SAC constitute **potential for adverse effects** on the distribution of European otter. This is inclusive of HDD Site 1 (Aquatic Sites 15) and HDD Site 2 (Aquatic Site 22).

Sprints are reliably used to determine the distribution of European otter (Reid *et al.* 2013; NPWS, 2021f). Sprints were identified along the GCR within Lough Gill SAC at Aquatic Site 15, 17 and 19.

As such, the construction phase of the proposed GCR constitutes the potential for adverse effects on European otter by undermining the attributes which define the conservation objectives for the Annex II species as presented in Table 8-11, namely;

- Distribution.

There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.



Summary

As such, in the absence of mitigation, there is **potential for adverse effects on the integrity of Lough Gill SAC** during the construction phase of the Proposed Project through undermining the conservation condition of the Annex II species 1355 European otter.

5.1.1.12 Lough Melvin SAC

Lough Melvin SAC (000428) is located 6.4km downstream of the proposed Wind Farm Site and hydrologically connected via the Lattone 35_010 (IE_NW_35L660960). As such, a hydrological pathway exists between the SAC and the proposed project.

The proposed internal access tracks to T1 and T2 will traverse the EPA river Lisdarush (EPA Code: 35L68) at 3 locations. In the absence of mitigation there is potential that the proposed works at these watercourse crossings and within 50m of the Lisdarush river, will result in the deterioration of surface water quality through contamination and/or the release of sedimentation leading to siltation of downstream watercourses with hydrological connectivity to the SAC.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated has the potential to be washed into the Lattone 35_010 waterbody. This constitutes potential for adverse effects on European sites, such as Lough Melvin SAC located c. 6.4km downstream. There is potential for adverse effects to QIs, specifically those which are sensitive to water quality, namely (NPWS, 2021e):

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea;
- 1106 Salmon (*Salmo salar*); and
- 1355 Otter (*Lutra lutra*).

No site excavations are scheduled during the operational and decommissioning phase. The hardstands and internal access tracks will be left in-situ. As such, adverse effects associated with siltation/contamination of downstream watercourses will be limited to the construction phase of the Proposed Project.

5.1.1.12.1 [3130] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea

The construction of the proposed Wind Farm has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Lough Melvin SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea as presented in Table 8-12, namely;

- Habitat area;
- Habitat distribution;
- Vegetation species richness;
- Vegetation composition: typical species;
- Vegetation composition: characteristic zonation;



- Vegetation distribution: maximum (euphotic) depth;
- Lake substratum quality;
- pH and Alkalinity;
- Nutrients;
- Water colour;
- Dissolved organic carbon (DOC);
- Turbidity;
- Transparency; and
- Attached algal biomass.

Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Lough Melvin SAC** during the construction phase of the Proposed Project by undermining the conservation objective for this Annex I habitat type.

5.1.1.12.2 [1106] Salmon (*Salmo salar*)

The construction of the proposed Wind Farm has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Lough Melvin SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex II species 1106 salmon as presented in Table 8-12, namely;

- Adult spawning fish;
- Salmon fry abundance;
- Number and distribution of redds; and
- Water quality.

Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Lough Melvin SAC** during the construction phase of the Proposed Project by undermining the conservation objective for this Annex II species.

5.1.1.12.3 [1355] Otter (*Lutra lutra*)

The construction of the proposed Wind Farm has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Lough Melvin SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex II species 1355 otter as presented in Table 8-12, namely;

- Fish biomass available.

Adverse effects on fish biomass availability would constitute an **adverse effect on the integrity of Lough Melvin SAC** during the construction phase of the Proposed Project by undermining the conservation objective for this Annex II species.

5.1.1.13 Lough Melvin SAC (NI)

The construction phase of the Proposed Project has potential to negatively impact the water quality status of Lough Melvin SAC NI due to the hydrological pathway from the Lattone 35_010 River which is present within the proposed Wind Farm site and crossed by the access roads to T1 and T2.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated has the potential to be washed into the Lattone 35_010 waterbody. This constitutes potential for adverse effects on European sites, such as Lough Melvin SAC NI located c. 8km downstream. There is potential for adverse effects to QIs, specifically those which are sensitive to water quality, namely (DAERA, 2015):

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea
- 1106 Salmon (*Salmo salar*).

5.1.1.13.1 [3130] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea

The construction of the proposed Wind Farm has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Lough Melvin SAC NI. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea as presented in Table 8-13, namely;

- Composition of macrophyte community;
- Macrophyte community structure;
- Water quality; and
- Sediment load.

Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Lough Melvin SAC NI** during the construction phase of the Proposed Project, by undermining the conservation objective for this Annex I habitat type.

5.1.1.13.2 [1106] Salmon (*Salmo salar*)

The construction of the proposed Wind Farm has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Lough Melvin SAC NI. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex II species 1106 salmon as presented in Table 8-13, namely;

- Population dynamics;
- Physical integrity – River substrate; and
- Water quality.



Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Lough Melvin SAC NI** during the construction phase of the Proposed Project by undermining the conservation objective for this Annex II species.

5.1.1.14 Unshin River SAC

The construction phase of the proposed GCR has potential to negatively impact the water quality status of Unshin River SAC due to the hydrological pathway from the Unshin_040 River which is present c. 40m from the southwestern extent of the proposed GCR.

In the absence of appropriate mitigation, contamination of water quality arising from surface water runoff, sedimentation, or pollution associated has the potential to be washed into the Unshin River waterbody. This constitutes potential for adverse effects on European sites, such as Unshin River SAC located c. 7.5km downstream. There is potential for adverse effects to QIs, specifically those which are sensitive to water quality, namely (NPWS, 2021d):

- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation;
- 1106 Salmon (*Salmo salar*); and
- 1355 Otter (*Lutra lutra*).

There are no scheduled works along the GCR as part of the operational phase and the grid will be left in-situ during the decommissioning phase. As such adverse effects associated with the GCR are limited to the construction phase.

5.1.1.14.1 [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

The construction of the proposed GCR has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Unshin River SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex I habitat type 3260 water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation as presented in Table 8-14, namely;

- Habitat area;
- Habitat distribution;
- Substratum composition: particle size range;
- Water quality;
- Typical species; and
- Riparian habitat: area and condition.

Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Unshin River SAC** during the construction and decommissioning phases of the Proposed Project, by undermining the conservation objective for this Annex I habitat.

5.1.1.14.2 [1106] Salmon (*Salmo salar*)

The construction of the proposed GCR has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead



downstream to Unshin River SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex II species 1106 salmon as presented in Table 8-14, namely;

- Adult spawning fish;
- Salmon fry abundance;
- Number and distribution of redds; and
- Water quality.

Adverse effects on the above attributes would constitute an **adverse effect on the integrity of Unshin River SAC** during the construction and decommissioning phases of the Proposed Project, by undermining the conservation objective for this Annex II species.

5.1.1.14.3 [1355] European Otter (*Lutra lutra*)

The construction of the proposed GCR has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Unshin River SAC. This constitutes potential for adverse effects on several attributes which determine the conservation condition of the Annex II species 1355 otter as presented in Table 8-14, namely;

- Fish biomass available.

Adverse effects on fish biomass availability would constitute an **adverse effect on the integrity of Unshin River SAC** during the construction and decommissioning phases of the Proposed Project, by undermining the conservation objective for the Annex II species European otter.

5.2 MITIGATION

The mitigation measures proposed have regard to the European Commission 2021 Guidance (EC, 2021) and the mitigation hierarchy more generally. The guidelines states that:

‘The hierarchy of mitigation measures suggests first avoidance (i.e. preventing significant impacts from happening in the first place) and then reduction of impact (i.e. reducing the magnitude and/or likelihood of an impact)’

In addition, the guidelines further state that:

‘Each mitigation measure must be described in detail, specifying how it will eliminate or reduce the adverse impacts identified, and how, when and by whom it will be implemented.’

It should be noted, in the Stage 1 Screening, the likelihood of significant effects on European sites was assessed based upon the source-pathway-receptor model only (OPR, 2021), and mitigation measures were not considered.

The mitigation measures proposed are outlined in the following sections and presented in Table 5-1.

5.2.1 Standard Good Working Practices

Good work practices will be employed at all times on site during all phases of the Proposed Project. However, good practice to protect watercourses from sediment contamination will be particularly important during the construction and decommissioning of the Proposed Project. Good working practices to protect watercourses are embedded in the design of the Proposed Project and consist of measures such as those set out in the following documents:

- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016);
- Forestry Harvesting and Environment Guidelines (Forestry Service, 2000);
- Forestry and Water Quality Guidelines (Forestry Service, 2000);
- Environmental Good Practice on Site Guide C811 (CIRIA, 2023);
- Spoil and Peat Management Plan (TOBIN, 2026, see Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, Appendix 2-5 – Spoil and Peat Management Plan);
- Construction and Environmental Management Plan (CEMP) (TOBIN, 2026, see Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, Appendix 2-4 - CEMP), and
- Surface Water Management Plan (SWMP) (TOBIN, 2026, see Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, Appendix 2-8 - SWMP).

The Construction Environmental Management Plan (CEMP) submitted as part of the documentation supporting the planning application will be revised as required by the appointed contractor and will be treated as a live document to be updated as required throughout the construction of the development (TOBIN, 2026, see Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, Appendix 2-4 - CEMP).



5.2.2 Construction Phase

5.2.2.1 Mitigation Measures for Habitat Loss

The construction phase of the GCR will result in the loss of 10m of Hedgerow (WL1) habitat within the boundaries of Lough Gill SAC to facilitate the proposed temporary launch pit at HDD Site 1. A further 0.01ha of (Mixed) broadleaved woodland (WD1) c. 70m beyond the boundary of Lough Gill SAC in Miltown Forest Recreation Area. No mitigation for the direct loss of habitat is necessary as there is no potential for adverse effects on QI habitats or species, in light of the conservation objectives, or the overall integrity of the SAC. Mitigation measures for disturbance to European otter is detailed in Section 5.2.2.1.

5.2.2.2 Mitigation Measures for Ground Water

The Hydrology and Hydrogeology Chapter (TOBIN, 2026, see Appendix 5: EIAR Chapter 8 – Hydrology and Hydrogeology) describes in detail the groundwater protection measures to be installed during the construction phase, which will ensure the Proposed Project proceeds without any adverse effects on groundwater dependant habitats and species within European sites. These mitigation measures are summarised in Table 5-1.

5.2.2.3 Mitigation Measures for Surface Water

The Surface Water Management Plan (TOBIN, 2026, see Appendix 1: EIAR Chapter 2 – Description of the Proposed Project, Appendix 2-8 - SWMP) describes in detail the water protection measures to be installed during the construction phase, which will ensure that any surface water arising from the Proposed Project during the operational and decommissioning phase will be contained and treated to ensure it can be dispersed from the Proposed Project without any adverse effects on downstream watercourses . These mitigation measures are summarised in Table 5-1.

5.2.2.4 Mitigation Measures for Disturbance to European Otter

As European otter is a crepuscular species, the restriction of works to avoid dusk/dawn will limit disturbance effects on European otter. Works will not begin until one hour after dawn and will cease an hour before dusk at POI 25 along the TDR and at all locations along the GCR inclusive of the following WFD river waterbodies Bonet_030, Bonet_040, Bonet_050, Shanvaus_010 and Brackary_010, specifically at Aquatic Site 15, 17, 19 and 22.

A temporary speed limit of 20km/h will be set for all vehicles transiting through the proposed Wind Farm Site, as well as within the active construction corridor along the GCR, for the duration of the Construction Phase. This will include the use of appropriate signage (Department of Transport, 2024):

- Sign reference: RUS 065;
- Normal sign diameter: 450mm;
- Repeater sign diameter: 300mm;
- Spacing between repeaters: 500m.

During pre-construction confirmatory surveys, where a previously unidentified holt or couch is identified, best practice guidance will be followed and is summarised hereunder (NRA, 2008b). There will be a temporary stop works within 150m of the identified holt, as instructed by the ECoW. Following inspection of the resting place by an ECoW, an exclusion zone will be erected. Trail cameras will be deployed for a minimum period of 5 days, to establish activity.



If the identified holt is an active breeding holt, consultation with NPWS will be sought, and no construction works will take place within 150m.

If the identified holt is active but confirmed as a non-breeding holt, then no tracked vehicles of any kind will be allowed within 20m of the site. Light clearing of vegetation will not take place within 15m of the holt (NRA 2008b).

If disturbance or destruction to the holt is necessary, an 'Application for Regulation 54 Derogations for Annex IV species' (NPWS, 2025b) derogation license will be obtained before interfering further with the holt. To minimise the impact of the derogation, when a holt appears to be inactive, then the entrance will be lightly blocked with vegetation and a light application of soil. When after 5 days the hold remains undisturbed, then it will be destroyed immediately using a mechanical digger. This will be carried out under supervision of the holder of the derogation license. For active holts, European otters will be evacuated from the holts prior to any closures. European otters with cubs however will not be evacuated until the European otters have vacated the holt themselves naturally. In the case of non-breeding active holts, general disturbance (e.g. vegetation clearance) and chemical deterrents will be used first to encourage the European otters to vacate the holts. Once the European otters have left the holt, the entrance will then be soft blocked.

In some cases, the installation of one-way gates on the entrances to the holt may be required and a monitoring period of 21 days will be carried out to ensure the European otters have left the holt prior to removal. For active non-breeding holts, general disturbance measures, such as vegetation clearance, will likely suffice in evacuating European otters from non-breeding holts. Following deployment of trail camera for five days to confirm abandonment of the holt, entrances will then be lightly blocked and destroyed, following the same approach as for inactive holts.

All European otter surveys and interventions will be carried out by the ECoW and suitably qualified ecologists. A report detailing the methods, actions, and relevant issues will be submitted to NPWS to fulfil the derogation license obligations. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works. These mitigation measures are summarised in Table 5-1.

5.2.2.5 Mitigation Measures for Disturbance/Displacement to SCI Species

There is no potential for adverse effects anticipated as a result of disturbance/displacement of SCI species following the proposed accommodations along the TDR. Therefore, no specific mitigation measures are necessary.

5.2.2.6 Mitigation Measures for the Spread of Invasive Alien Species

Three invasive alien species (IAS) listed on the Third Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 477/2011), were identified within the proposed Wind Farm Site and along the GCR namely, Himalayan balsam, Japanese Knotweed and Rhododendron. Furthermore, Japanese Knotweed is also regulated under the Second Schedule of S.I. 374/2024, which restricts the movement of vector materials containing these species.

Mitigation measures required to prevent the spread of the aforementioned IAS are presented in detail in the Invasive Species Management Plan in (Appendix A-II). These mitigation measures are summarised in Table 5-1.



5.2.3 Operational phase Mitigation Measures

During the operational phase of the Proposed Project, no activities will take place along the TDR or GCR. There is no potential for disturbance to QI/SCI species of European sites during the operational phase.

All construction-phase mitigation measures within the proposed Wind Farm Site, including water quality measures (e.g., SuDS), will remain in place, ensuring that any ongoing operational activities do not result in adverse effects on the integrity of European sites.

5.2.3.1 Mitigation Measures for Spread of Invasive Alien Species

Standard maintenance operations of the proposed Wind Farm introduce the potential for adverse effects on European sites via the spread of IAS.

Two IAS listed on the Third Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 477/2011), were identified within the proposed Wind Farm Site.

- Japanese Knotweed (*Fallopia japonica*); and,
- Rhododendron (*Rhododendron ponticum*).

Invasive species located within the proposed Wind Farm Site will be monitored and controlled. Where regrowth is observed during the operational phase, the treatment procedure will be repeated. Relevant procedures are detailed in Appendix A-II. These mitigation measures are summarised in Table 5-1.

5.2.4 Decommissioning Phase Mitigation Measures

The Proposed Project is expected to be operational for 35 years. Following this, the site will be decommissioned. Decommissioning phase effects are expected to be of a lesser magnitude, duration and scale to those anticipated during the construction phase.

Upon decommissioning of the proposed Wind Farm Site, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated, cut up to allow them to fit on a standard articulated lorry and removed off-site for recycling.

Turbine foundations will remain in place underground and along with hardstands will be allowed to revegetate naturally. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option. The site roadways will be in use for additional purposes to the operation of the wind farm (e.g. for forest/agricultural access) by the time the decommissioning of the project is to commence, and therefore it is more appropriate to leave the site roads in situ for future use. All site entrances will remain in place during decommissioning as they will form part of the site access infrastructure for ongoing forestry and agricultural activities.

The decommissioning phase will not require any significant works that will impact on the drainage network, as the drainage system will remain in place to serve the access roads. Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil. A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the mobile fuel tank at all times and the tank will be stored at the construction compound when not in use.



The on-site substation and 110kV grid connection (GCR) will not be removed at the end of the useful life of the wind farm project as it will form part of the national electricity network. Therefore, the substation will be retained as a permanent structure and will not be decommissioned. Therefore, there is **no potential for adverse effects on the integrity of European Sites** during the decommissioning phase associated with the GCR.

The decommissioning phase for the project will not require the use of the TDR POIs as the turbine components would be cut up on site to sizes that would fit on standard articulated trucks. As such, water quality protection measures will not be required during the decommissioning phase along the TDR. There is **no potential for adverse effects on the integrity of European Sites** during the decommissioning phase associated with the TDR.

5.2.4.1 Mitigation Measures for Disturbance/Displacement SCI/QI Species

Mitigation measures for the disturbance to QI and SCI species along the TDR are listed in Section 5.2.2.4 and Section 5.2.2.5. These measures will also be implemented during the decommissioning phase to prevent disturbance/displacement to QI/SCI species within European sites. These mitigation measures are summarised in Table 5-1.

5.2.4.2 Mitigation Measures for Disturbance/Displacement to SCI Species

To mitigate the need for vegetation clearance along the TDR and potential for disturbance/displacement of SCI species during the decommissioning phase, the turbine components will be cut up on site to sizes that fit on standard articulated trucks for disposal off-site.

These mitigation measures are summarised in Table 5-1.

5.2.4.3 Mitigation Measures for Spread of Invasive Alien Species

The use of large-scale machinery within the proposed Wind Farm during the decommissioning phase of the Proposed Project introduces the potential for adverse effects on European sites via the spread of IAS. Mitigation measures for the control of invasive alien species are listed in Appendix A-II and will be implemented during the decommissioning phase as necessary. These mitigation measures are summarised in Table 5-1.

5.2.5 Roles and Responsibilities

The applicant will appoint a contractor to construct the Proposed Project and the contractor will provide a suite of specialists, including an ECoW, as part of their delivery team. The role of the ECoW is defined by British Standard BS 42020:2013² as “*person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to “development” site personnel on necessary working practices required to i) safeguard ecological features on site and ii) aid compliance with any consents and relevant wildlife legislation related to the works.*”

The requirements of the ECoW role will be fulfilled by a single individual with support and assistance provided by technical specialists and senior colleagues when required. The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role and in addition, where needed, can access

² BS 42020:2013 is the Biodiversity – Code of practice for planning and development. Published by British Standards Institute (Currently being updated by BSI).



support from senior ecologists within the company with the required qualifications, training and experience.

The ECoW will have the power to 'Stop Works' at any time they deem it necessary to do so.

The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology/biodiversity as set out in the project NIS, EIAR, CEMP and SWMP. The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation. The ECoW will also document activities using photographs and log information to registers/logs. The role of the ECoW includes tasks such as, but not limited to, the following:

- Pre-construction confirmatory surveys for otter;
- Consultation with NPWS and application for an otter derogation licence, if required;
- Monitoring and exclusion of otter holts, if required;
- Demarcation of riparian habitats to be maintained;
- Review of construction phase lighting plans;
- Supervision of works in ecologically sensitive areas as required to ensure compliance with environmental legislation and the requirement of the schedule of works and EIAR;
- Preparation of Method Statements for ecological tasks such as those described above; and
- Provide a briefing on environmental protection measures and ecological sensitivities of the Proposed Project to all site personnel in advance of commencement of enabling works.

On completion of construction the applicant, or their appointed agents, will be responsible for managing and operating the Proposed Project in line with the requirements of the planning conditions and mitigation measures required for the operational and decommissioning phases. The names and contact details of the individuals with responsibility for implementation and supervision of mitigation measures during all phases of the development will be clearly identified and set out in documents such as the CEMP and site-specific method statements as appropriate.



Table 5-1: Summary of Proposed Mitigation Measures

Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
Construction Phase				
Habitat Loss	N/A	N/A	N/A	N/A
Alteration of Groundwater Flow	<p>A minimum buffer of 500m will be implemented between turbines/borrow pits and water wells and the proposed wind farm site is not located within a designated drinking water supply zone.</p> <p>Borrow pits are proposed to be excavated up to 7m deep and turbine foundations up to 4 m deep.</p>	All mitigation measures will be implemented throughout the duration of the construction phase.	<p>Implementation of the mitigation measures will be overseen by the supervising environmental manager/clerk of works, ecologists.</p> <p>The dewatering operations will be inspected once each day when dewatering is taking place to ensure that dewatering treatment controls are working correctly and to evaluate whether there are observable indicators of sediment discharges</p> <p>Regular monitoring of groundwater (levels and quality) will take place using existing monitoring boreholes</p>	<p>500m buffer is sufficient to ensure no interaction with drawdown within the cone of depression.</p> <p>Avoidance of Regionally Important aquifer are 10-20 m below ground level across the karstic area.</p>
Contamination of Groundwater	<p>Groundwater pumped from excavations will be managed using silt bags, settlement ponds, sediment traps, and the SuDS network.</p> <p>A hydrocarbon interceptor will be installed at the construction compound.</p>	All mitigation measures will be implemented throughout the duration of the construction phase.	Regular inspection and maintenance of hydrocarbon interceptor, and sediment traps, mapping of karst features.	<p>Removes suspended solids from water by filtration and settlement.</p> <p>Hydrocarbon interceptor removes petrochemicals from water.</p>



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
	<p>30m buffer from karst features and karst protocol will be employed.</p> <p>Ground stabilisation measures will be employed following approval from a geotechnical engineer.</p>			<p>Avoids interaction between surface water and groundwater.</p> <p>Limits soil displacement during construction.</p>
Sedimentation/contamination of Surface Water	<p>SWMP will be implemented by the appointed contractor</p> <p>Interceptor drains (SuDS) will be installed up-gradient of all proposed infrastructure to collect clean surface runoff.</p> <p>Swales (SuDS) will be installed along access tracks in advance of the main construction phase.</p> <p>25 settlement ponds (SuDS) will be located downstream of road swale sections and at hardstand locations.</p>	All mitigation measures will be implemented during the construction phase within the proposed Wind Farm Site.	<p>SWMP will be regularly audited throughout the construction phase.</p> <p>Relevant incidents will be reported to the site manager and Environmental Clerk of Works.</p> <p>All surface water features will be monitored in order to record any variations in the quality of the local surface water environment related to the Proposed Project.</p>	<p>The SuDS devices as part of the proposed Wind Farm Site have been designed to mimic existing greenfield runoff in terms of quantity and quality of runoff.</p> <p>Interceptor drains collect clean surface runoff in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained.</p> <p>Swales control run-off from the running surface to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points</p> <p>Settlement ponds to manage/buffer volumes of runoff discharging from the drainage system during periods of high rainfall, thereby reducing the hydraulic loading to watercourses</p>
	<p>Silt traps and a double row silt fences will be placed immediately down-gradient of near-stream works along the TDR, GCR and proposed Wind Farm Site for the duration of the construction phase.</p> <p>Turbine locations will include an infiltration basin composed of geotextile membrane/filter material.</p>	All mitigation measures will be implemented during the construction phase within the TDR, GCR and proposed Wind Farm Site.		



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
	<p>No refuelling of machinery will take place within 50 m of a watercourse.</p> <p>Excavated material will not be stockpiled or side-cast within 50 m of a watercourse.</p> <p>Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil.</p>			
	<p>Full washout of trucks will occur off-site where, where appropriate facilities are already in place. Water from chute rinsing on-site will use the minimum necessary volume of water and washout will be directed into a temporary lined, impermeable containment area.</p> <p>A hydrocarbon interceptor will be installed at the construction compound, where the fuel and a double skinned and banded mobile fuel tank will be stored when not in use.</p> <p>A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the tank at all times</p> <p>There will be no re-fuelling within 50m of watercourses.</p>	All mitigation measures will be implemented during the construction phase within the proposed Wind Farm Site.		This will prevent contaminates entering surface waters.
Disturbance/Displacement of QI Species	<p>During pre-construction confirmatory surveys, where a previously unidentified holt or couch is identified, best practice guidance will be followed (NRA, 2008b).</p> <p>There will be a temporary stop works within 150m of the identified holt, as instructed by the ECoW.</p>	All mitigation measures will be implemented during the construction phase along the GCR and TDR.	All European otter surveys and interventions will be carried out by the ECoW and suitably qualified ecologists A report detailing the methods, actions, and relevant issues will be	Mitigation measures will ensure avoidance of breeding holts.



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
	<p>Following inspection of the resting place by an ECoW, an exclusion zone will be erected.</p> <p>If the identified holt is active but confirmed as a non-breeding holt, then no tracked vehicles of any kind will be allowed within 20m of the site. Light clearing of vegetation will not take place within 15m of the holt.</p> <p>If disturbance or destruction to the holt is necessary, an 'Application for Regulation 54 Derogations for Annex IV species' (NPWS, 2025b) derogation license will be obtained before interfering further with the holt.</p>		<p>submitted to NPWS to fulfil the derogation license obligations. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works.</p>	
Spread of Invasive Alien Species	<p>Invasive Species Management Plan will be implemented along the TDR, GCR and within proposed Wind Farm Site where Third Schedule (S.I. No. 477/2011) invasive species are encountered.</p> <p>Japanese Knotweed will be treated using foliar herbicide.</p> <p>Himalayan balsam will be controlled manually.</p> <p>Rhododendron will be treated via flail or spot treatment with herbicide.</p>	<p>All mitigation measures will be implemented and throughout the duration of the construction phase and implemented along the GCR.</p>	<p>Follow up monitoring will take place 6 to 8 weeks post treatment with a second round of combined management scheduled for that time.</p> <p>Monitoring of treatment areas will take place 12 months after the completion of mechanical removal works on site.</p> <p>Any plants or sapling growth that are observed at this time shall be recorded, mapped and scheduled for retreatment.</p>	<p>Measures will prevent the spread of invasive species to SACs/SPAs during the construction phase.</p>



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
Operational phase				
<p>Spread of Invasive Alien Species</p>	<p>Invasive Species Management Plan will be implemented within proposed Wind Farm Site where Third Schedule (S.I. No. 477/2011) invasive species are encountered.</p>	<p>All mitigation measures will be implemented throughout the duration of the operational phase and within the proposed Wind Farm Site.</p>	<p>Follow up monitoring will take place 6 to 8 weeks post treatment with a second round of combined management scheduled for that time.</p> <p>Monitoring of treatment areas will take place 12 months after the completion of mechanical removal works on site.</p> <p>Any plants or sapling growth that are observed at this time shall be recorded, mapped and scheduled for retreatment.</p>	<p>Measures will prevent the spread of invasive species to SACs/SPAs during the operational phase.</p>



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
Decommissioning Phase				
Sedimentation/contamination of Surface Water	<p>SuDS will remain in-situ during the decommissioning phase.</p> <p>Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil.</p> <p>A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the mobile fuel tank at all times.</p> <p>There will be no re-fuelling within 50m of watercourses.</p>	All mitigation measures will be implemented throughout the duration of the decommissioning phase along the TDR and within the proposed Wind Farm Site.	Relevant incidents will be reported to the site manager and Environmental Clerk of Works.	To avoid sedimentation and contamination of surface water during decommissioning works.
Spread of Invasive Alien Species	Invasive Species Management Plan will be implemented within proposed Wind Farm Site where Third Schedule (S.I. No. 477/2011) invasive species are encountered.	All mitigation measures will be implemented throughout the duration of the decommissioning phase and implemented within the proposed Wind Farm Site.	<p>Follow up monitoring will take place 6 to 8 weeks post treatment with a second round of combined management scheduled for that time.</p> <p>Monitoring of treatment areas will take place 12 months after the completion of mechanical removal works on site.</p> <p>Any plants or sapling growth that are observed at this time shall be recorded, mapped and scheduled for retreatment.</p>	Measures will prevent the spread of invasive species to SACs/SPAs during the decommissioning phase.



Potential Adverse Effect	Mitigation Measure	Timescale for Implementation	Monitoring Requirements	How the Measures will Avoid/Reduce Effects
Disturbance/Displacement of QI Species	<p>During pre-construction confirmatory surveys at POI 25 along the TDR, where a previously unidentified holt or couch is identified, best practice guidance will be followed (NRA, 2008b).</p> <p>There will be a temporary stop works within 150m of the identified holt, as instructed by the ECoW. Following inspection of the resting place by an ECoW, an exclusion zone will be erected.</p> <p>If the identified holt is active but confirmed as a non-breeding holt, then no tracked vehicles of any kind will be allowed within 20m of the site. Light clearing of vegetation will not take place within 15m of the holt.</p> <p>If disturbance or destruction to the holt is necessary, an 'Application for Regulation 54 Derogations for Annex IV species' (NPWS, 2025b) derogation license will be obtained before interfering further with the holt.</p>	All mitigation measures will be implemented throughout the duration of the construction phase implemented along the TDR at POI 25.	All European otter surveys and interventions will be carried out by the ECoW and suitably qualified ecologists. A report detailing the methods, actions, and relevant issues will be submitted to NPWS to fulfil the derogation license obligations. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works.	Mitigation measures will ensure avoidance of breeding holts.
Disturbance/Displacement of SCI Species	To mitigate the need for vegetation clearance along the TDR and potential for disturbance/displacement of SCI species during the decommissioning phase, the turbine components will be cut up on site to sizes that fit on standard articulated trucks for disposal off-site.	All mitigation measures will be implemented during the decommissioning phase.	N/A	This will prevent any adverse disturbance impacts to SCI species along the TDR



5.3 IN-COMBINATION EFFECTS

This section of the NIS presents the assessment carried out to analyse and examine whether other plans or projects have the potential to act in-combination with the Proposed Project to adversely affect the integrity of European sites

Many European sites fall outside of the Zol of the Proposed Project and therefore no possibility of in-combination effects arises in connection with these European sites. In the case of plans or projects which may potentially affect those European sites outside of the Zol, they simply are not capable of having an in-combination effect with the Proposed Project and do not require further consideration. Plans and projects deemed to be relevant for the purposes of examining in-combination effects include those which have potential to impact on European sites which fall within the Zol of the Proposed Project. In the case of the Proposed Project, for the large part, this has included plans and projects falling within the same water catchments which support European sites. A non-catchment-based analysis has also been used to identify additional plans and projects which may have potential to impact on European sites which fall within the Zol of the Proposed Project, but for other impact pathways or sources. For example, other plans or projects in proximity to European sites which fall within the Zol of the Proposed Project which might give rise to disturbance were considered for in-combination effects.

The plans or projects which have been scoped in for the NIS are listed in the Appropriate Assessment Screening Report and consist of the following:

- Forestry felling within the Survey Area of the Proposed Wind Farm Site;
- Faughary Wind Farm;
- Carrickeeny Wind Farm;
- Quarry extension at Cornmore and Carrickoghil, Killarga;
- Flood Relief Scheme at Dromahair; and,
- Wastewater treatment plant, Rossinver.

5.3.1 Forestry

The potential for adverse effects on downstream aquatic ecology extend to QI species for Lough Gill SAC, Lough Melvin SAC and Lough Melvin SAC NI. No other European sites are located downstream of the proposed Wind Farm Site where the forestry felling is to take place

Forestry operations are subject to their own impact assessments and licensing processes, ensuring that likely significant effects are considered and mitigated (DAFM, 2024). Standard forestry practices include mitigation measures for water quality protection such as (DAFM, 2024):

- Set back distances from watercourses;
- Silt control measures including silt traps; and
- Maintenance of silt traps to prevent overflow.

The current forestry operations operating within the Survey Area of the proposed Wind Farm Site drain into the Owenmore (Manorhamilton)_020, Brackary_010, and Latone 35_010. These WFD river waterbodies have received a “good” water quality status (TOBIN, 2026, see Table 4). This demonstrates the effectiveness of current water protection mitigation measures



implemented within the within the Survey Area of the proposed Wind Farm Site as part of the current forestry operations.

The aforementioned mitigation measures apply as standard for forestry operations in Ireland. Given that the Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1, it is not anticipated that adverse in-combination effects will arise. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with the other forestry operations within the Survey Area for the Proposed Wind Farm Site to result in adverse effects on the integrity of Lough Gill SAC, Lough Melvin SAC, and Lough Melvin SAC (NI) or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.3.2 Wind Farms

5.3.2.1 Faughary Wind Farm

Faughary Wind Farm is located 530m west of T6 of the proposed Wind Farm Site. The Wind Farm was established in 2015 and as such, any effects arising from the construction and operation of Faughary Wind Farm are established and contribute to the current baseline conditions. The Faughary Wind Farm is drained by the Owenmore (Manorhamilton)_020. This WFD river waterbody is a shared potential pathway within the proposed Wind Farm Site to Lough Gill SAC.

The Owenmore (Manorhamilton)_020 has received a "good" water quality status (TOBIN, 2026, see Table 4). This demonstrates the effectiveness of current water protection mitigation measures implemented within Faughary Wind Farm. The Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with Faughary Wind Farm to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites in view of conservation objectives, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.3.2.2 Carrickeeny Wind Farm

Carrickeeny Wind Farm (ACP ref. 312895) is located approximately 8km to the west of the proposed Wind Farm Site. Carrickeeny Wind Farm is upstream and hydrologically connected to Lough Gill SAC via the Shanvaus_010. This constitutes a shared pathway for in-combination effects with the Proposed Project. However, Carrickeeny Wind Farm has been operational since



2014, and any effects arising from its construction and operation contribute to the existing ecological baseline within the Zol of the Carrickeeny Wind Farm. The scheme represents a small-scale development with a limited operational footprint and does not give rise to ongoing construction-related pressures.

There is a potential pathway for in-combination effects on Lough Gill SAC due to the shared hydrological pathway between Carrickeeny Wind Farm and the Proposed Project via the Shanvaus_010. The Shanvaus_010 has received a “*good*” water quality status (TOBIN, 2026, see Table 4). This demonstrates the effectiveness of current water protection mitigation measures implemented within Carrickeeny Wind Farm.

The Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with Carrickeeny Wind Farm to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites as a consequence of the Proposed Project acting in-combination with this ‘other’ project.

5.3.2.3 Quarry Extension at Kerrigan Quarries Carrickoghil, Killarga

Kerrigan Quarries Carrickoghil, Killarga (Planning Ref: 15176) is located c. 10km south of the proposed Wind Farm Site. The quarry discharges into Bonet_050 (EPA Stream Orcusconny 35017). This constitutes hydrological connectivity with Lough Gill SAC as well as a shared hydrological pathway with the proposed Wind Farm Site.

Contamination and siltation were considered potential likely significant effects on water quality as a result of the quarry extension (ESPI, 2015a). Subsequent effects on European otter species as a result of reduction in food resources, following deterioration of water quality were also considered (ESPI, 2015b).

As the planning application was granted in 25/01/2016, any effects arising from its construction and operation contribute to the existing ecological baseline within the Zol of the quarry extension.

The Bonet_050 has received a “*good*” water quality status (TOBIN, 2026, see Table 4). This demonstrates the effectiveness of current water protection mitigation measures implemented within Kerrigan Quarries. It was concluded in the Appropriate Assessment Screening Report for the quarry extension that compliance with the mitigation measures on water quality will avoid the occurrence of significant effects (ESPI, 2015a).

The Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with Kerrigan Quarries Carrickoghil, Killarga to result in adverse effects on the integrity of Lough Gill SAC or any other European site.



No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites in view of conservation objectives, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.3.2.4 Flood Relief Scheme, Dromahair

The proposed Flood Relief Scheme at Dromahair, Co. Leitrim (ACP. Ref 322018) has potential for adverse effects on the integrity of Lough Gill SAC, as identified during the NIS as a hydrological pathway with this development exists via the Bonet_050 (TOBIN, 2024a). This constitutes hydrological connectivity with Lough Gill SAC as well as a shared hydrological pathway with the proposed Wind Farm Site.

Following the implementation of mitigation measures it was concluded that there will be no significant effects on water quality or QI species and habitats as a result of the Flood Relief Scheme at Dromahair (TOBIN, 2024a). Mitigation measures for the Flood Relief Scheme also include those for disturbance/displacement of European otter as well as an invasive species management plan for Japanese Knotweed and Himalayan balsam.

The Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1. These measures comprise standard best-practice mitigation measures for water quality, disturbance/displacement of European otter, as well as the control of invasive species.

Therefore, there is no potential for the Proposed Project to act in-combination with Flood Relief Scheme at Dromahair, Co. Leitrim to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites in view of conservation objectives, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.3.2.5 Wastewater treatment plant, Rossinver

The upgrade of the existing wastewater treatment plant (WWTP) in Rossinver (ACP. Ref 320024) is located 1.4km south of Lough Melvin SAC (TOBIN, 2024b). The proposed WWTP will discharge treated effluent to the Ballagh_010 and Lough Melvin, both part of the Lough Melvin SAC. The northern shores of Lough Melvin are located within Lough Melvin SAC (NI).

The proposed Wind Farm Site will also drain into Lough Melvin SAC and Lough Melvin SAC (NI) via the Ballagh_010 and as such this constitutes a shared pathway for potential adverse effects,

The Ballagh_010 received a "good" water quality status (TOBIN, 2026, see Table 4). This demonstrates the effectiveness of current water protection mitigation measures implemented within the WWTP.

The NIS assesses the potential for adverse effects on the following QIs of Lough Melvin SAC and Lough Melvin SAC (NI):

- [3130] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea
- [1106] Atlantic salmon (*Salmo salar*); and,



-
- [1355] European otter (*Lutra lutra*) [QI for Lough Melvin SAC only].

Following the implementation of mitigation measures, it was concluded that there is no residual, direct or indirect effects that could adversely affect the integrity of Lough Melvin SAC (TOBIN, 2024b).

The Proposed Project will also implement water quality mitigation measures as described in Section 5.2.2.3 and Table 5-1. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with WWTP in Rossinver to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for adverse effects on the integrity of European sites in view of conservation objectives, as a consequence of the Proposed Project acting in-combination with this 'other' project.



6. TRANSBOUNDARY EFFECTS

Annex IV of the Environmental Impact Assessment Directive (2011/92/EU) as amended implements the Espoo and Aarhus Conventions in the EU, and as such mandates a description of transboundary effects (European Commission, 2025). Transboundary effects are defined as likely significant effects on the environment within the territory of another European Economic Area Member States (EEA States) (Planning Inspectorate, 2025).

At nearest distance, the proposed Wind Farm Site is located 3.6km south of the border with Northern Ireland. Accordingly, the potential for transboundary effects has been considered, with regard to shared pathways between the Proposed Project and European sites.

The WFD river waterbody Lattone 35_010 (WFD Code: IE_NW_35L660960), constitutes a potential hydrological pathway for adverse effects between the proposed Wind Farm Site and Lough Melvin NI SAC (NI) (UK0030047) Northern Ireland. The potential for adverse effects on Lough Melvin NI SAC (NI) is considered in Section 5.1.1.13.

Mitigation measures (Section 5.2.2.3), including the avoidance of instream works through the use of clear span bridges for the 3 watercourse crossings along the WFD river waterbody Lattone 35_010, are designed to protect water quality and downstream European sites. Following the implementation of these mitigation measures. There are no significant residual effects anticipated on the QIs of the SAC (NI) nor the overall integrity of these sites as a result of the Proposed Project.

On this basis, while potential transboundary pathways have been identified and assessed, there are **no transboundary residual effects on European sites** anticipated as a result of the Proposed Project.



7. CONCLUSION

In the absence of mitigation, the pathways for potential adverse effects were identified for the 13 European sites within the Zone of Influence of the Proposed Project, namely;

- Arroo Mountain SAC;
- Ballysadare Bay SAC;
- Ballysadare Bay SPA;
- Ben Bulbin, Gleniff and Glenade SAC;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Cummeen Strand SPA;
- Donegal Bay SPA;
- Drumcliff Bay SPA;
- Glenade Lough SAC;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI); and,
- Unshin River SAC.

The pathways for potential adverse effects on the aforementioned European sites are the siltation/contamination of surface water and ground water, as well as disturbance to QI/SCI species as a result of proposed construction, operational and decommissioning phase activities proposed for the TDR, GCR and proposed Wind Farm Site.

However, following the application of the detailed mitigation measures, in view of best scientific knowledge, on the basis of objective information, it has been concluded that there is no potential for adverse effects on the identified QI and SCI species and their associated targets and attributes, or on overall site integrity, either alone or in combination with other plans or projects, in light of the conservation objectives of these European sites.

The impact assessment has considered all elements of the Proposed Project in full, inclusive of the TDR and GCR as well as the design flexibility in relation to turbine models.

The in-combination effects assessment, concludes that the Proposed Project, either individually or cumulatively with other projects, is not anticipated to result in adverse effecteffects on any of the identified European sites.

The potential for transboundary effects has been assessed and, taking account of the proposed mitigation measures, no adverse effects on European sites within Northern Ireland or any other neighbouring jurisdictions are anticipated.

In summary, there will be no adverse effects on the integrity of any European sites during the construction, operational and decommissioning phases of the Proposed Project, either alone or in-combination with any other plans or projects.



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Appendix A-I POTENTIAL FOR ADVERSE EFFECTS (PRE-MITIGATION)

Table 8-1: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Arroo Mountain SAC (NPWS, 2016d)³

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
7220 Petrifying springs with tufa formation (Cratoneurion)			
Habitat area	Square meters	Area stable or increasing, subject to natural processes	Within Arroo Mountain SAC, the overall area of habitat 7220* is given in Perrin et al. (2013) as 0.9ha (NPWS, 2016d). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site has potential to reduce the area (square meters) of the QI habitat. As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Habitat distribution	Occurrence	No decline, subject to natural processes	The highest concentration of occupied polygons is in the extreme west of the SAC (NPWS, 2016d), with some occurrence closer to the Application Site Boundary of the proposed Wind Farm Site (4.7km at closest distance). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site has potential to reduce the habitat distribution of the QI habitat. As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Hydrological regime: Flooding depth/height of water table	Metres	Maintain appropriate hydrological regime	Petrifying springs rely on permanent irrigation. The hydrological regimes of individual springs are currently unknown in detail (NPWS, 2016d). Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T3 and T11. Groundwater vulnerability has been identified as extreme at T3 and moderate at T11. This constitutes potential for the Proposed Project to have an adverse effect on the hydrological regime (flooding depth/height of water table) of Arroo Mountain SAC.
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions	Water chemistry is currently unknown for springs in this SAC, but characteristically, petrifying spring water has high values for pH, alkalinity and dissolved calcium and is oligotrophic (NPWS, 2016d). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site has potential to reduce the water quality of the QI habitat. As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Vegetation composition: typical species	Occurrence	Maintain typical species	Irish petrifying springs are highly specialised and usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). The bryophytes <i>Palustriella commutata</i> and <i>Cratoneuron filicinum</i> are diagnostic of petrifying springs and are found in this habitat in the SAC (NPWS, 2016d). It is likely these specialist species would be highly susceptible to changes in water quality and by extension an accidental contamination event.

³ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.1) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
<p>As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).</p>			
<p>4010 Northern Atlantic wet heath with <i>Erica tetralix</i></p>			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	<p>The total current area of wet heath is 304.4ha, covering 7.7% of the SAC (NPWS, 2016d). Flushes are the only component of wet heaths considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing following groundwater contamination of Glenaniff and Glencar GWBs through contamination associated with site excavations in the west of the proposed Wind Farm Site. As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes.	<p>Wet heath was recorded mainly through the southern western portion of the SAC (NPWS, 2016d), c. 2km from the proposed Wind Farm Site at nearest distance. Dewatering associated with construction activities has potential to alter the habitat distribution through drawdown of the water table, specifically in flushes where groundwater discharges into the wet heath habitat. There is potential for adverse effects on the occurrence and distribution of flushes within wet heaths as a result of the Proposed Project.</p>
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	<p>Wet heaths are a nutrient poor environment with low pH. There is no potential for adverse effects on the soil pH and nutrient levels as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, hydrocarbons will not alter pH or nutrient status of peatland soils.</p>
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	<p>Perrin et al. (2014) recorded six different wet heath communities within this SAC. Flushes are classified as distinct vegetation communities under the National Survey of Upland Habitats, with 8 flush communities identified constituting c. 105ha within the SAC (Perrin et al. 2014). Flush vegetation communities are a natural part of blanket bog ecosystems and a reduction in the abundance in the variety of flush vegetation communities constitutes a reduction in the variety of vegetation communities within the blanket bog system. There is potential for adverse effects on the abundance of variety of flush vegetation communities within the SAC following groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site. As such, potential contamination from site excavations constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of 2m x 2m monitoring stops	Cross-leaved heath (<i>Erica tetralix</i>) present near each monitoring stop	<p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin <i>et al</i>/2013). Any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. In the unlikely event of groundwater contamination, there is potential for occurrence of Cross-leaved heath (<i>Erica tetralix</i>).to be reduced within 20m of a representative number of 2m x 2m monitoring stops at specific location(s) where the contaminated water discharges into the wet heath habitat. The unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of positive indicator species within flushes to reduce below 50% at specific location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous to be reduced below 10% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (<i>Empetrum nigrum</i>) at least 15%	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of ericoid species to be reduced below 15% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Crowberry (<i>Empetrum nigrum</i>) is typical of montane heath not flushes (Perrin <i>et al</i>/2013).</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of dwarf shrub species to be reduced below 75% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 5 monitoring stops were recorded within the wet heath habitats (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of negative indicator species not typical of peatland habitats to increase above 1% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat.</p>



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of native trees and shrubs less than 20%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of native trees and shrubs to increase above 20% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat, due to changes in vegetation composition. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of bracken to increase above 10% following changes in vegetation composition within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of soft rush to increase following changes in vegetation composition within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of <i>Sphagnum</i> mosses to decrease below 10% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: signs of browsing	Percentage at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	No changes to grazing/browsing within the SAC are proposed as part of the Proposed Project. The Proposed Project will not have any effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: burning	Occurrence in local vicinity of a representative number of 2m x 2m monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	No burning will take place within the SAC as part of the Proposed Project. The Proposed Project will not have an effect on the occurrence of burning within the SAC.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of disturbed bare ground to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No changes to livestock numbers within the SAC will take place as part of the Proposed Project. No artificial drainage ditches will be excavated within the SAC as part of the Proposed Project. The Proposed Project will not have adverse effects on drainage from heavy trampling, tracking or ditches.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No relevant species were recorded in this habitat during the National Survey of Upland Habitats conducted within the SAC (Perrin <i>et al.</i> 2013).
7130 Blanket bogs (* if active bog)			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The total current area of blanket bog is 2174.9ha (54.8% of the SAC). This comprises 2096.3ha of active blanket bog area and 78.6ha of inactive blanket bog (NPWS, 2016d). Flushes are the only component of blanket bogs considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing, following groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site. As such, potential contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes.	Blanket bog is abundant along the lower flanks of the SAC but was also frequent on gently sloping higher ground within the SAC (NPWS, 2016d), c. 2km from the proposed Wind Farm Site at nearest distance. Dewatering associated with construction activities has potential to alter the habitat distribution through drawdown of the water table, specifically in flushes where groundwater discharges into the wet heath habitat. This constitutes potential for adverse effects on the occurrence and distribution of flushes within blanket bog as a result of the Proposed Project.
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Blanket bogs are a nutrient poor environment with low pH. There is no potential for adverse effects on the soil pH and nutrient levels as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, hydrocarbons will not alter pH or nutrient status of peatland soils.
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog	Natural hydrology unaffected by drains and erosion	96.4% of the Annex I blanket bog habitat is currently active within the SAC (NPWS, 2016d). There is potential for adverse effects on the abundance of active peat forming vegetation communities at ground water discharge zones within the SAC following groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site. As such, potential contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin <i>et al.</i> (2014) recorded six different blanket bog communities within this SAC. Flushes are classified as distinct vegetation communities under the National Survey of Upland Habitats, with 8 flush communities identified constituting c. 105ha within the SAC (Perrin <i>et al.</i> 2014). Flush vegetation communities are a natural part of blanket



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			<p>bog ecosystems and a reduction in the abundance in the variety of flush vegetation communities constitutes a reduction in the variety of vegetation communities within the blanket bog system.</p> <p>There is potential for adverse effects on the abundance of variety of flush vegetation communities within the SAC following groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site.</p> <p>As such, potential contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
<p>Vegetation composition: positive indicator species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Cover of positive indicator species at least 50%</p>	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of positive indicator species within flushes to reduce below 50% at specific location(s) where the contaminated water discharges into the blanket bog habitat.</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 11 monitoring stops were recorded within the blanket bog habitat (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
<p>Vegetation composition: lichens and bryophytes</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i>, at least 10%</p>	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of bryophytes or lichens (excluding <i>Sphagnum fallax</i>) to decrease below 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat.</p> <p>Only 38 monitoring stops were recorded within Arroo Mountain SAC during the National Survey of Upland Habitats and of those 11 monitoring stops were recorded within the blanket bog habitat (Perrin <i>et al</i>/2013). As such, any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
<p>Vegetation composition: potential dominant species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Cover of each of the potential dominant species less than 75%</p>	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of potentially dominant species such as <i>Calluna vulgaris</i>, <i>Eleocharis multicaulis</i>, <i>Eriophorum vaginatum</i>, <i>Molinia caerulea</i>, <i>Schoenus nigricans</i>, <i>Trichophorum germanicum</i> to increase above 75% individually within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
<p>Vegetation composition: negative indicator species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Total cover of negative indicator species less than 1%</p>	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of negative indicator species not typical of peatland habitats to increase above 1% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	<i>Campylopus introflexus</i> was recorded forming extensive carpets within this habitat and as a coloniser of bare peat there is potential for the cover of the non-native species to increase following the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of native trees and shrub species less than 10%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of native trees and shrubs to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat, due to changes in vegetation composition. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of Sphagnum mosses to decrease below 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: signs of browsing	Percentage at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	No changes to livestock numbers within the SAC will take place as part of the Proposed Project. No artificial drainage ditches will be excavated within the SAC as part of the Proposed Project. The Proposed Project will not have an effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: burning	Occurrence in local vicinity of a representative number of 2m x 2m monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	No burning will take place within the SAC as part of the Proposed Project. The Proposed Project will not have an effect on the occurrence of burning within the SAC.
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of disturbed bare ground to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No changes to livestock numbers within the SAC will take place as part of the Proposed Project. No artificial drainage ditches will be excavated within the SAC as part of the Proposed Project. The Proposed Project will not have adverse effects on drainage from heavy trampling, tracking or ditches.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Physical structure: erosion	Occurrence in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	<p>In the unlikely event of groundwater contamination of Glenaniff and Glencar GWBs through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of erosion gullies and eroded areas to comprise more than 5% within the SAC following contaminated water discharges into the blanket bog habitat.</p> <p>Contamination from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Arroo Mountain SAC by undermining the conservation objective for the Annex I habitat type.</p>
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No relevant species were recorded in this habitat during the National Survey of Upland Habitats conducted within the SAC (Perrin <i>et al.</i> 2013).

Table 8-2: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Ballysadare Bay SAC (NPWS, 2013b)⁴

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
1130 Estuaries			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	The Proposed Project will not take place within the SAC boundary and therefore will not result in a loss in the extent of estuaries. There is no potential no adverse effects.
Community extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which lead downstream to Ballysadare Estuary which could impact upon the distinguishing community types associated with the Annex I habitat type 1130 Estuaries. Changes to the community extent, distribution and structure would constitute an adverse effect on the integrity of Ballysadare Bay SAC by undermining the conservation objective for this Annex I habitat type.
Community structure: <i>Zostera</i> density	Shoots/m ²	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes	
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand with <i>Angulus tenuis</i> community complex; Muddy sand to sand with <i>Hediste diversicolor</i> , <i>Corophium volutator</i> and <i>Peringia ulvae</i> community complex; Fine sand with polychaetes community complex; Sand with bivalves, nematodes and crustaceans community complex; Intertidal reef community complex; Subtidal reef community complex.	
1140 Mudflats and sandflats not covered by seawater at low tide			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	The Proposed Project will not take place within the SAC boundary and therefore will not result in a loss in the extent of mudflats and sandflats. There is no potential for adverse effects.
Community extent	Occurrence	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes.	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which lead downstream to Ballysadare Estuary which could impact upon the community of <i>Zostera</i> -. Changes to the community extent, distribution and structure would constitute an adverse effect on the integrity of Ballysadare Bay SAC by undermining the conservation objective for this Annex I habitat type.
Community structure: <i>Zostera</i> density	Presence/absence of physical barriers	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes.	
Community distribution	Occurrence	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes.	
1365 Harbour seal <i>Phoca vitulina</i>			
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	The Proposed Project will not take place within the SAC boundary and therefore will not result in any barriers to accessibility within Ballysadare Estuary. There is no potential for adverse effects.
Moulting behaviour	Moult haul-out sites	Conserve the moult haulout sites in a natural condition.	The Proposed Project will not take place within the SAC boundary and therefore will not result in any disturbance to harbour seal moult and/or resting haul-out sites. There is no potential for adverse effects.
Resting behaviour	Resting haul-out sites	Conserve the resting haulout sites in a natural condition.	

⁴ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.2) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	The Proposed Project will not take place within nor within close proximity (c. 8.9km north-west of the proposed GCR at nearest distance) to the SAC boundary and therefore will not result in any disturbance to harbour seal. There is no potential no adverse effects.

Table 8-3: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives on Ballysadare Bay SPA⁵ (NPWS, 2013c)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
A046 Brent Goose <i>Branta bernicla hrota</i>			
Population trend	Percentage change	Long term population trend stable or increasing	In the absence of appropriate mitigation, the proposed development has the potential to result in a degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats within the SPA. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the QI species within the SPA. These effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A141 Grey Plover <i>Pluvialis squatarola</i>			
Population trend	Percentage change	Long term population trend stable or increasing	In the absence of appropriate mitigation, the proposed development has the potential to result in a degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats within the SPA. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the QI species within the SPA. These effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A149 Dunlin <i>Calidris alpina alpina</i>			
Population trend	Percentage change	Long term population trend stable or increasing	In the absence of appropriate mitigation, the proposed development has the potential to result in a degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats within the SPA. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the QI species within the SPA. These effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A157 Bar-tailed Godwit <i>Limosa lapponica</i>			
Population trend	Percentage change	Long term population trend stable or increasing	In the absence of appropriate mitigation, the proposed development has the potential to result in a degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats within the SPA. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the QI species within the SPA. These effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A162 Redshank <i>Tringa totanus</i>			
Population trend	Percentage change	Long term population trend stable or increasing	In the absence of appropriate mitigation, the proposed development has the potential to result in a degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect

⁵ Only the SCIs with potential to be affected by the Proposed Project are considered as other SCIs have been excluded (refer to Section 5.1.1.3) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	foraging or roosting habitats within the SPA. Such effects could lead to changes in the extent or spatial distribution of suitable habitat and, in turn, affect population trends and/or the distribution of the QI species within the SPA. These effects would constitute an adverse effect on the integrity of the site in view of its conservation objectives.
A999 Wetlands			
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2130 hectares, other than that occurring from natural patterns of variation	In the absence of appropriate mitigation, the proposed development has the potential to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect downstream wetland habitats associated with this European site. Such effects could lead to a reduction in the area of these habitats and, if they were to occur, would constitute an adverse effect on the integrity of the affected European site in view of its conservation objectives.

Table 8-4: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives Ben Bulben, Gleniff and Glenade SAC⁶ (NPWS, 2021a)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
7220 Petrifying springs with tufa formation (Cratoneurion)			
Habitat area	Square meters	Area stable or increasing, subject to natural processes	<p>Within the SAC, the overall area of the Annex I habitat area of 2.6ha (NPWS, 2021a). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glencar GWB through site excavations at T11 as well as the nearby substation, construction compound and western site entrance, have potential to reduce the area (square meters) of the QI habitat. Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T11. Groundwater vulnerability has been identified as moderate at T11. As petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to reduce the area (square meters) of the QI habitat. As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).</p>
Habitat distribution	Occurrence	No decline, subject to natural processes	<p>The highest concentration of mapped springs is along the northern boundary of the SAC, with the closet spring to the proposed Wind Farm Site at a distance of 8.5km and is in the extreme east of the SAC (NPWS, 2021a). Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound and western site entrance, have potential to reduce the habitat distribution by changing the vegetation communities associated with the springs. Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T11. Groundwater vulnerability has been identified as moderate at T11. As petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to reduce the distribution of the QI habitat. As such, dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).</p>
Hydrological regime: height of water table	Metres; meters per second	Maintain appropriate hydrological regime	<p>Petrifying springs rely on permanent irrigation (NPWS, 2021a). The hydrological regimes of individual springs are currently unknown in detail (NPWS, 2021a). Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T11. Groundwater vulnerability has been identified as moderate at T11. As petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to reduce the height of the water table and alter the hydrological regime of the QI habitat. This constitutes potential for the Proposed Project to have an adverse effect on the hydrological regime (flooding depth/height of water table) of Ben Bulben, Gleniff and Glenade SAC. The proposed accommodations at POI 25 consist of trimming c. 10m of hedgerow along the public road network. As such, there is no potential for run-off associated with these works or disturbance to the height of the water</p>

⁶ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.4) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			table. There is no potential for proposed works at POI 25 to have an adverse effect on the hydrological regime (height of water table) of Ben Bulben, Gleniff and Glenade SAC.
Physical structure: tufa formations	Seepage rate to the spring and groundwater quality (saturated calcium carbonate, pH, temperature and alkalinity conditions)	Maintain appropriate levels of tufa formation	Seepage flow rates are crucial for the development of tufa (NPWS, 2021a). Drawdown of the water table at T11 and the associated alteration of groundwater flow have potential to alter the seepage rate of petrifying springs and as such the physical structure of tufa formations. Groundwater vulnerability at T11 has been identified as moderate. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Ecosystem function: water quality - nitrate level	mg/l	Maintain nitrate level at less than 10mg/l	Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glencar GWBs through site excavations site excavations at T11 as well as the nearby substation, construction compound and western site entrance, have potential to reduce the water quality of the QI habitat. However, contamination will not alter nitrate levels as nitrates are associated with artificial fertilizers. There are no fertilizers scheduled for use as part of the Proposed Project. As such, there is no potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC as a result of nitrate levels.
Ecosystem function: water quality - phosphate level	µg/l	Maintain phosphate level to less than 15µg/l	Mixed source pollution to surface and groundwaters (limnic and terrestrial) is considered a main pressure/threat to the habitat (NPWS, 2025b). Contamination of Glencar GWBs through site excavations site excavations at T11 as well as the nearby substation, construction compound and western site entrance, have potential to reduce the water quality of the QI habitat. However, contamination will not alter phosphate levels as phosphates are associated with artificial fertilizers. There are no fertilizers scheduled for use as part of the Proposed Project. As such, there is no potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC as a result of phosphate levels.
Vegetation composition: community diversity	Variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Irish petrifying springs are highly specialised and usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). Eight plant communities of petrifying springs in Ireland (NPWS, 2021a). It is likely these specialist species would be highly susceptible to changes in water quality and by extension an accidental contamination event Contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound and western site entrance, have potential to reduce the water quality of the QI habitat. Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T11. Groundwater vulnerability has been identified as moderate at T11. As petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to alter the hydrological regime of the habitat thus reducing the abundance of specialist species and vegetation communities. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number	Irish petrifying springs are highly specialised and usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). Eight plant communities of petrifying springs in Ireland (NPWS, 2021a). It is likely these specialist positive/high quality indicator species are highly susceptible to changes in water quality and by extension an accidental contamination event Contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound, and western site entrance, have potential to reduce the water quality of the QI habitat. Drawdown of the water table and alteration of groundwater flow have been identified as potential effects associated with dewatering at T11. Groundwater vulnerability has been identified as moderate at T11. As



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to alter the hydrological regime of the habitat thus reducing the abundance of positive indicator species. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; potentially negative woody species should be absent in unwooded springs; invasive species should be absent	As no works are to take place within the SAC as part of the Proposed Project, there is no potential for the spread of invasive species. Contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound, and western site entrance, have potential to alter vegetation composition where contaminated water discharges into the QI habitat. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat. Under such circumstances, there is potential for an increase in the cover of negative indicator woody species as the habitat becomes less suitable for sensitive specialist species. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%	Algal cover is indicative of nutrient enrichment (NPWS, 2021a). There are no fertilizers scheduled for use as part of the Proposed Project and as such there will be no associated enrichment of groundwater bodies. As such, there is no potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC as a result of phosphate levels.
Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground)	Contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound, and western site entrance, have potential for a decrease habitat suitability for sensitive specialist species. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat. In this way, there is potential for alterations to vegetation structure as woody species encroach into the habitat. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objectives for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant	No changes to livestock rates within the SAC are associated with the Proposed Project, and as such there is no potential for alteration to the presence of trampling/dung within the QI habitat. As such, there is no potential for the for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC as a result of changes to rates of trampling/dung within the QI habitat.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	Irish petrifying springs are highly specialised and usually dominated by bryophytes (mosses and liverworts) (NPWS, 2025b). The Near Threatened mosses <i>Hymenostylium recurvirostrum</i> var. <i>insigne</i> , <i>Orthothecium rufescens</i> and <i>Seligeria patula</i> and the vulnerable moss <i>Seligeria oelandica</i> were recorded at various sub-sites in the SAC (NPWS, 2021a). It is likely these specialist species would be highly susceptible to changes in water quality and by extension an accidental contamination event. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat. As petrifying springs rely on permanent irrigation (NPWS, 2021a), dewatering of the karstified aquifer has potential to alter the hydrological regime of the habitat thus reducing the abundance of rare, threatened and scarce species. As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type 7220 Petrifying springs with tufa formation (Cratoneurion).
7230 Alkaline fens			



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The Annex I habitat type 7230 Alkaline fens occupies 22.7ha, covering only 0.4% of the SAC (NPWS, 2021a). Contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site has potential to reduce the area (hectares) of the QI habitat. Similarly, dewatering at T11 has potential to alter ground water flow within the karstified aquifer constituting potential to reduce the area (hectares) of the QI habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Habitat distribution	Occurrence	No decline, subject to natural processes.	The Annex I habitat type 7230 Alkaline fens occur across the SAC on lower slopes, most frequently below the cliffs at Annacoona. Contamination of Glencar GWBs through site excavations in the west of the proposed Wind Farm Site has potential to reduce the habitat distribution by changing the vegetation communities associated with the Annex I habitat. Similarly, dewatering at T11 has potential to alter ground water flow within the karstified aquifer constituting potential to reduce discharge rates of calcium rich waters and as such the occurrence of Alkaline fens. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	There is no potential for adverse effects on the soil pH and nutrient levels as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, pollution from hydrocarbons will not alter pH or nutrient status of peatland soils.
Ecosystem function: peat formation	Percentage cover of peat-forming vegetation and water table levels	Maintain active peat formation, where appropriate	In order for peat to form, water levels need to be slightly below or above the soil surface for c.90% of the time (NPWS, 2021a). There is no potential for Proposed Project to have adverse effects on the flow of groundwater. However, contamination of groundwater may reduce the abundance of sensitive peat forming species within the habitat. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat and reduce the abundance of sensitive peat forming species within the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Ecosystem function: water quality	Water chemistry measures	Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	There is no potential for adverse effects on the pH and nutrient levels as a result of the Proposed Project, as pollution from hydrocarbons will not alter pH or nutrient (nitrogen) status of the water. However, contamination of groundwater may reduce the abundance of sensitive peat forming species disrupting the structure and functioning of the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Four different alkaline fen vegetation communities were identified within the SAC (NPWS, 2021a). Contamination of groundwater may reduce the variety of Alkaline fen vegetation communities within the SAC. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat and reduce the abundance of sensitive peat forming species within the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Vegetation composition: positive indicator species (brown mosses)	Percentage cover at a representative number of 2m x 2m monitoring stops	Number of brown moss species present at each monitoring stop at least one	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the abundance of positive indicator species (brown mosses) to decrease at specific locations within fens where the contaminated groundwater discharges. Contamination of groundwater may reduce the abundance of positive



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			<p>indicator species (brown mosses) within the habitat. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat and to reduce the abundance of brown moss species within the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.</p>
<p>Vegetation composition: positive indicator species (vascular plants)</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (<i>Schoenus nigricans</i>) flush and bottle sedge (<i>Carex rostrata</i>) fen</p>	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the abundance of positive indicator species (vascular plants) to fall below 20% and below 75% for black bog-rush (<i>Schoenus nigricans</i>) flush and bottle sedge (<i>Carex rostrata</i>) fen, through changes in vegetation composition at specific locations within where the contaminated groundwater discharges. Contamination of groundwater may reduce the abundance of positive indicator species (vascular plants) within the habitat. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat and reduce the abundance of positive vascular plant indicator species within the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.</p>
<p>Vegetation composition: cover of positive indicator species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (<i>Schoenus nigricans</i>) flush and bottle sedge (<i>Carex rostrata</i>) fen</p>	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the abundance of positive indicator species (brown mosses and vascular plants) to fall below 20% and below 75% for black bog-rush (<i>Schoenus nigricans</i>) flush and bottle sedge (<i>Carex rostrata</i>) fens, through changes in vegetation composition at specific locations within fens where the contaminated groundwater discharges. Similarly, dewatering at T11 has potential to alter the water table within the karstified aquifer constituting potential to alter the hydrological regime of the QI habitat and reduce the abundance of positive vascular plant indicator species within the habitat. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.</p>
<p>Vegetation composition: negative indicator species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Total cover of negative indicator species less than 1%</p>	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site the abundance of negative indicator species may increase above 1%, through changes in vegetation composition within fens at specific locations where the contaminated groundwater discharges into the habitat. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat leading to increases in the abundance of negative indicator species. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.</p>
<p>Vegetation composition: non-native species</p>	<p>Percentage cover at a representative number of 2m x 2m monitoring stops</p>	<p>Cover of non-native species less than 1%</p>	<p>No site works are scheduled within the SAC as Part of the Proposed Project. There is no potential for the percentage cover of non-native species to increase above 1% as a result of the Proposed Project.</p>
<p>Vegetation composition: native trees and shrubs</p>	<p>Percentage cover in local vicinity of a representative number of monitoring stops</p>	<p>Cover of sprainttered native trees and shrubs less than 20%</p>	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of native trees and shrubs to increase above 20% through changes in vegetation composition within fens at specific the location(s) where the contaminated water discharges. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat leading to increases in the abundance of sprainttered trees and shrubs.</p>



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Vegetation composition: soft rush and common reed cover	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of soft rush (<i>Juncus effusus</i>) and common reed (<i>Phragmites australis</i>) less than 10%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of soft rush and common reed cover to increase above 10% through changes in vegetation composition within fens at specific the location(s) where the contaminated water discharges, due to changes in vegetation composition. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat leading to changes in vegetation composition. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.
Vegetation structure: height	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 5cm above the ground surface should be at least 50%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for changes in vegetation structure including height within fens at specific the location(s) where the contaminated water discharges through changes in species composition and structure inclusive of height. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat leading to changes in community structure and height. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat..
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the cover of disturbed bare ground to increase above 10% within fens at specific the location(s) where the contaminated water discharges. Similarly, dewatering at T11 has potential to alter the hydrological regime of the QI habitat leading to changes in community structure and height. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site and dewatering at T11 constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat..
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No drainage or increase in livestock numbers within the SAC will take place as a result of the Proposed Project. There is no potential for the percentage cover of area showing signs of drainage from heavy trampling, tracking or ditches above 10% as a result of the Proposed Project.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Hepatic mats of the <i>Calluna vulgaris-Herbertus aduncus</i> community have been recorded within the SAC (NPWS, 2021g). This vegetation community is not groundwater dependent and there is no potential for adverse effects on the habitat as a result of the Proposed Project.
4010 Northern Atlantic wet heaths with <i>Erica tetralix</i>;			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The total current area of wet heath is 44.4ha, covering 0.7% of the SAC (NPWS, 2021a). Flushes are the only component of wet heaths considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing following changes in vegetation composition as a result of dewatering at T11 and groundwater contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes.	Wet heath was recorded with a fragmented distribution within the SAC with blanket bog being the more dominant habitat type (NPWS, 2021a). Flushes are the only component of wet heaths considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing following changes in vegetation composition as a result of dewatering at T11 and groundwater contamination of Glencar GWBs through site excavations at T11 as well as the nearby substation, construction compound and at the western site entrance. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Wet heaths are a nutrient poor environment with low pH. There is no potential for adverse effects on the soil pH and nutrient levels a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, pollution from hydrocarbons will not alter pH or nutrient status of peatland soils.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Five different wet heath communities have been recorded within this SAC. Flushes are classified as distinct vegetation communities under the National Survey of Upland Habitats. Flush vegetation communities are a natural part of blanket bog ecosystems and a reduction in the abundance in the variety of flush vegetation communities constitutes a reduction in the variety of vegetation communities within the blanket bog system. Supporting documentation lacks detail on the community diversity of poor flushes identified within the SAC (NPWS, 2021g). There is potential for adverse effects on the abundance of variety of flush vegetation communities within the SAC following groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and dewatering at T11. As such, dewatering at T11 and the potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of 2m x 2m monitoring stops	Cross-leaved heath (<i>Erica tetralix</i>) present near each monitoring stop	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for occurrence of Cross-leaved heath (<i>Erica tetralix</i>), within 20m of a representative number of 2m x 2m monitoring stops at specific location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition and potential reduction in peatland flora including the abundance of <i>Erica tetralix</i> . Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of positive indicator species within flushes to reduce below 50% at specific location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition and potential reduction in positive indicator species. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i>	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous to be reduced below 10% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		and pleurocarpous mosses at least 10%	alter the water table of the karstified aquifer leading to changes in vegetation composition and potential reduction in peatland lichens and bryophytes. Any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (<i>Empetrum nigrum</i>) at least 15%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of ericoid species to be reduced below 15% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition and potential for reduction in abundance of ericoid species and crowberry (<i>Empetrum nigrum</i>). Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of dwarf shrub species to be reduced below 75% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition and potential for reduction in the cover of dwarf shrub species. Any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of negative indicator species not typical of peatland habitats to increase above 1% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition including potential for reduction in the cover of specialist peatland flora and increase in the cover of negative indicator species. Any failure of a monitoring stop is likely to have an impact on the overall habitat condition assessment. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	No works are scheduled within the SAC. As such, there is no potential for the spread of non-native species to increase above 1% as a result of the Proposed Project.
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of native trees and shrubs species less than 20%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of native trees and shrubs to increase above 20% through changes in vegetation composition within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat. Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition including potential for reduction in the cover of specialist peatland flora and increase in the cover of native trees and shrubs.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	<p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p> <p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of bracken to increase above 10% following changes in vegetation composition within flushes at specific location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition including potential for reduction in the cover of specialist peatland flora and increase in the cover of bracken (<i>Pteridium aquilinum</i>).</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of soft rush to increase following changes in vegetation composition within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition including potential for reduction in the cover of specialist peatland flora and increase in the cover of soft rush (<i>Juncus effusus</i>).</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	No works are proposed within the SAC as part of the Proposed Project. There will be no effect on livestock numbers and associated condition of <i>Sphagnum</i> being crushed, broken and/or pulled up by livestock within the SAC The Proposed Project will not have an effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: signs of browsing	Percentage at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	No works are proposed within the SAC as part of the Proposed Project. There will be no effect on livestock numbers and associated heavy trampling/tracking by livestock nor any effect on the cover of drainage ditches within the SAC The Proposed Project will not have an effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: burning	Occurrence in local vicinity of a representative number of 2m x 2m monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	No works are proposed within the SAC as part of the Proposed Project inclusive of burning. The Proposed Project will not have an effect on the occurrence of burning within the SAC.
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of disturbed bare ground to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the wet heath habitat.</p> <p>Similarly, dewatering at T11 has potential to alter the water table of the karstified aquifer leading to changes in vegetation composition including potential for reduction in the cover of specialist peatland flora leading to an increase in the cover of disturbed bare ground.</p>



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	No works are proposed within the SAC as part of the Proposed Project. As such there will be no effect on livestock numbers and associated heavy trampling/tracking by livestock nor any effect on the cover of drainage ditches within the SAC. The Proposed Project will not have adverse effects on drainage from heavy trampling, tracking or ditches.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	No relevant species were recorded in this habitat during the National Survey of Upland Habitats conducted within the SAC (Perrin <i>et al.</i> 2013).
7130 Blanket bogs (* if active bog)			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The total area of blanket bog in the Ben Bulben, Gleniff and Glenade Complex SAC is 2,134.5ha (35.6% of the SAC). This comprises 2,083.5ha of active blanket bog and 51.0ha of inactive blanket bog (NPWS, 2021a). Flushes are the only component of blanket bogs considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing, following groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of the water table following dewatering at T11. As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes.	Blanket bog is the dominant habitat type within the SAC (NPWS, 2021a), located c. 8.4km from the proposed Wind Farm Site at nearest distance. Flushes are the only component of blanket bogs considered to be groundwater dependent by the EPA (2010) and as such it is the area (hectares) of flushes which are at potential risk of decreasing, following groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of the water table following dewatering at T11. As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Blanket bogs are a nutrient poor environment with low pH. There is no potential for adverse effects on the soil pH and nutrient levels as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, pollution from hydrocarbons will not alter pH or nutrient status of peatland soils.
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog	Natural hydrology unaffected by drains and erosion	97.6% of the Annex I blanket bog habitat is currently active within the SAC (NPWS, 2021a). There is potential for adverse effects on the abundance of active peat forming vegetation communities at ground water discharge zones within the SAC following groundwater contamination of Glencar GWBs through site excavations in the west of the proposed Wind Farm Site and/or alteration of the water table following dewatering at T11. As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Five different blanket bog communities have been identified within this SAC (NPWS, 2021a). Flush vegetation communities are a natural part of blanket bog ecosystems and a reduction in the abundance in the variety of flush vegetation communities constitutes a reduction in the variety of vegetation communities within the blanket bog



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			<p>system. No further information is provided on the poor flush vegetation communities identified within the SAC (NPWS, 202g).</p> <p>There is potential for adverse effects on the abundance of variety of flush vegetation communities within the SAC following groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of the water table following dewatering at T11.</p> <p>As such, dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of positive indicator species within flushes to reduce below 50% at specific location(s) where the contaminated water discharges into the blanket bog habitat. Similarly, the effects of dewatering have potential to have adverse effects on the vegetation composition and cover of positive indicator species within the QI habitat.</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i> , at least 10%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of bryophytes or lichens (excluding <i>Sphagnum fallax</i>) to decrease below 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the cover of bryophytes and lichens within the QI habitat.</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of potentially dominant species such as <i>Calluna vulgaris</i>, <i>Eleocharis multicaulis</i>, <i>Eriophorum vaginatum</i>, <i>Molinia caerulea</i>, <i>Schoenus nigricans</i>, <i>Trichophorum germanicum</i> to increase above 75% individually within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the percentage cover of dominant species within the QI habitat.</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	<p>In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of negative indicator species not typical of peatland habitats to increase above 1% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the percentage cover of negative indicator species within the QI habitat.</p> <p>Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.</p>

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	<i>Campylopus introflexus</i> was recorded forming extensive carpets within this habitat and as a coloniser of bare peat there is potential for the cover of the non-native species to increase following the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site. Similarly, the effects of dewatering at T11 have potential to increase in bare peat and proliferation of <i>Campylopus introflexus</i> within the QI habitat. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of native trees and shrubs species less than 10%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of native trees and shrubs to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat, due to changes in vegetation composition. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the percentage cover of native trees and shrubs within the QI habitat. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	No works are proposed within the SAC as part of the Proposed Project. There will be no effect on livestock numbers and associated condition of <i>Sphagnum</i> being crushed, broken and/or pulled up by livestock within the SAC The Proposed Project will not have an effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: signs of browsing	Percentage at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	No works are proposed within the SAC as part of the Proposed Project. There will be no effect on livestock numbers and associated heavy trampling/tracking by livestock nor any effect on the cover of drainage ditches within the SAC The Proposed Project will not have an effect on the occurrence of grazing/browsing within the SAC.
Vegetation structure: burning	Occurrence in local vicinity of a representative number of 2m x 2m monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	The Proposed Project will not have an effect on the occurrence of burning within the SAC. No works are proposed within the SAC as part of the Proposed Project inclusive of burning.
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of disturbed bare ground to increase above 10% within flushes at specific the location(s) where the contaminated water discharges into the blanket bog habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the proliferation of bare ground within the QI habitat. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy	The Proposed Project will not have adverse effects on drainage from heavy trampling, tracking or ditches No works are proposed within the SAC as part of the Proposed Project. There will be no effect on livestock numbers

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		trampling, tracking or ditches less than 10%	and associated heavy trampling/tracking by livestock nor any effect on the cover of drainage ditches within the SAC The Proposed Project will not have an effect on the occurrence of drainage within the SAC.
Physical structure: erosion	Occurrence in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or effects associated with dewatering at T11, there is potential for the reduction in sensitive peatland flora and an increase in the cover of bare ground. Under such circumstances, there is potential for the percentage cover of erosion gullies and eroded areas to increase above 5% within the SAC. Contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Hepatic mats of the <i>Calluna vulgaris-Herbertus aduncus</i> community have been recorded within the SAC (NPWS, 2021g). This community is not groundwater dependent, and there is no pathway for adverse effects on the habitat as a result of the Proposed Project.
7140 Transition mires and quaking bogs			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The total area of the Annex I habitat type 7140 Transition mires and quaking bogs in the Ben Bulben, Gleniff and Glenade Complex SAC is 4.1ha, covering only c.0.1% of the SAC (NPWS, 2021a). The Annex I habitat type 7140 Transition mires and quaking bogs is considered a groundwater dependent by the EPA (2010). As such, the area (hectares) of habitat is at potential risk of decreasing, in the unlikely event of contamination of the Glencar GWB through site excavations in the west of the proposed Wind Farm Site and dewatering at T11. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes.	The distribution of the Annex I habitat type 7140 Transition mires and quaking bogs is sprintrtered throughout the SAC (NPWS, 2021a) and is located c. 8.4km from the proposed Wind Farm Site at nearest distance. In the unlikely event of contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site, any contaminated water discharging into a transition mire habitat has potential to cause changes in vegetation composition which could lead to a decline in current distribution. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the vegetation composition inclusive of the habitat distribution. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	There is no pathway for adverse effects on the soil pH and nutrient levels a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, pollution from hydrocarbons will not alter pH or nutrient status of soils.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Three different transition mire vegetation communities were identified within the SAC (NPWS, 2021a). Contamination of groundwater may reduce the variety of these transition mire vegetation communities within the SAC. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the diversity of vegetation communities associated with the QI habitat. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the QI habitat.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Vegetation composition: number of positive indicator species	Number at a representative number of 2m x 2m monitoring stops	Number of positive indicator species at least three for in-filling pools and flushes and at least six for fens	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for a reduction in the number of positive indicator species within transition mires, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the number of positive indicator species within the transition mires resulting from drawdown and changes to groundwater flow. Dewatering at T11 and potential contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: number of core positive indicator species	Number at a representative number of 2m x 2m monitoring stops	At least one core positive indicator species present	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for a reduction in the number of positive indicator species within transition mires to reduce below 1 species per monitoring stop, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the number of positive indicator species within the transition mires resulting from drawdown and changes to groundwater flow. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of positive indicator species is at least 25%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of positive indicator species within transition mires to reduce below 25%, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to have adverse effects on the cover of positive indicator species within the transition mires resulting from drawdown and changes to groundwater flow. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the percentage cover of negative indicator species within transition mires to increase above 1%, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to lead to increases in the cover of negative indicator species within the transition mires resulting from drawdown and changes to groundwater flow. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	There is no pathway for the Proposed Project to increase the cover of non-native species within the SAC. There are no works proposed within the SAC and as such there is no potential for the spread of invasive species within the SAC.
Vegetation composition: height	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for changes in vegetation composition and a such vegetation height within transition mires, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to alter the species within the transition mire and with it the vegetation height within the local vicinity.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	In the unlikely event of groundwater contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for an increase of bare ground above 10% within transition mires, at specific location(s) where the contaminated water discharges into the habitat. Similarly, the effects of dewatering at T11 have potential to increase the cover of bare ground within transition mires within the SAC. Dewatering at T11 and contamination of the Glencar GWB from site excavations in the west of the proposed Wind Farm Site constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	There is no pathway for the Proposed Project to increase the cover of areas showing signs of drainage from heavy trampling, tracking or ditches above 10% within the SAC. The Proposed Project will have no effects on the livestock rates within the SAC and as such no effect on trampling/tracking. Similarly, there are no works proposed within the SAC and as such there will be no excavations of drainage ditches.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Hepatic mats of the <i>Calluna vulgaris-Herbertus aduncus</i> community have been recorded within the SAC (NPWS, 2021g). This community is not groundwater dependent, and there is no pathway for adverse effects on the habitat as a result of the Proposed Project.
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The distribution of Annex I habitat type Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels is widespread across the SAC, with the habitat being 8.9km at nearest distance to the proposed Wind Farm Site. In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for adverse effects on the area of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline, subject to natural processes	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for adverse effects on the distribution of the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	There is no potential for adverse effects on the soil pH and nutrient level of flushes as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, hydrocarbons will not alter pH or nutrient status of peatland soils.
Community diversity	Abundance of variety of vegetation communities	Maintain variety of Vegetation communities, subject to natural processes	Two tall herb communities were identified within this SAC, namely TH2 - <i>Cochlearia pyrenaica</i> tall herb vegetation and TH3 - <i>Sedum rosea-Angelica sylvestris</i> tall herb vegetation (NPWS, 2021a). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for adverse effects on the community diversity of the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: number of positive indicator species	Number of species at a representative number of monitoring stops	At least one positive indicator species at each monitoring stop	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for a reduction in the number of positive indicator species within the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of monitoring stops	Cover of positive indicator species at least 25%	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for a reduction in the cover of positive indicator species within the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops	Cover of non-native species less than 1%	No works are proposed within the SAC, therefore there is no potential for the spread of invasive species. There is no pathway for the Proposed Project to increase the cover of non-native species within the SAC.
Vegetation structure: height/flowering	Percentage/occurrence at a representative number of monitoring stops	At least 50% of tall herb stems should be greater than 20cm tall or signs of flowering/ability to flower should be present	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for a reduction in the cover of positive indicator species within the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation structure: grazing	Percentage of flowering tall herb shoots grazed at a representative number of monitoring stops	Live shoots of flowering tall herb shoots showing signs of grazing less than 50%	There is no pathway for the Proposed Project to increase grazing/stocking rates within the SAC.
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of disturbed bare ground in monitoring stop less than 25% and less than 10% in local vicinity of monitoring stop	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site and/or alteration of groundwater flows associated with the proposed dewatering at T11, there is potential for an increase in the cover of disturbed bare ground within the Annex I habitat type Hydrophilous tall herb fringe communities within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Ben Bulben, Gleniff and Glenade SAC by undermining the conservation objective for the Annex I habitat type.
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Hepatic mats of the <i>Calluna vulgaris-Herbertus aduncus</i> community have been recorded within the SAC (NPWS, 2021g). This vegetation community is not groundwater dependent and there is no potential for adverse effects on the habitat as a result of the Proposed Project.
1355 European Otter			
Distribution	Percentage positive survey sites	No significant decline	POI 25 is located c. 137m from the boundary of Ben Bulben, Gleniff and Glenade SAC at nearest distance. A short section (c. 10m) of Hedgerow (WL1) bordering the public road network will be trimmed to accommodate an over sail area at POI 25. Best practice guidance lists works within 20-150m have the potential to cause disturbance/displacement to breeding/resting otter and a such impact distribution (NRA, 2008a). As such, there is potential for adverse effects



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			on the distribution of the species temporarily as hedge trimming is taking place. This constitutes a pathway for potential adverse effect on the integrity of the SAC.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along riverbanks / around ponds	The extent of European otter habitat includes a 10m terrestrial buffer along watercourses, identified as critical for otters (NPWS, 2021a). The Proposed Project will not result in any decline of terrestrial habitat within the SAC, as no works (including the clearance of vegetation) will occur outside the Proposed Project. There is therefore no potential for adverse effects.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 616.6km	The Proposed Project will not result in any decline in the freshwater river habitat within the SAC, as no works (including the clearance of vegetation) will take place within the SAC.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha	The Proposed Project will not result in any decline in the freshwater lake habitat, as no works (including the clearance of vegetation) will occur within the SAC. There is, therefore, no potential for adverse effects.
Couching sites and holts	Number	No significant decline	No holts or couching sites were recorded at POI 25 during multidisciplinary surveys along the TDR. The proposed trimming of a short section (c. 10m) of Hedgerow (WL1) at POI 25 constitutes potential for disturbance to couching sites and holts as European otter use the habitat for such. As such the proposed TDR constitutes potential for adverse effects on the integrity of the SAC through disturbance of a European otter couching site/holt.
Fish biomass available	Kilograms	No significant decline	The potential degradation of groundwater quality could affect the availability of fish biomass to European otter if contaminated groundwater discharges into a watercourse within the SAC, in the unlikely event of contamination of the Glencar GWB from site excavations to the west of the proposed Wind Farm Site. A significant decline in fish biomass available for the Q1 European otter constitutes an adverse effect on the integrity of Ben Bulben, Gleniff and Glenade SAC.
Barriers to connectivity	Number	No significant increase. for guidance	European otter will regularly commute across stretches of open water up to 500m and it is important that such commuting routes are not obstructed (NPWS, 2021a). The Proposed Project does not include works within the SAC and connectivity with the SAC will not be impacted. There is, therefore, no potential for adverse effects on the SAC.

Table 8-5: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (NPWS, 2024a)⁷

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
1130 Estuaries			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes	The Proposed Project will not take place within the SAC boundary and therefore will not result in a loss in the extent of estuaries. There is no potential for adverse effects.
Community extent	Hectares	Maintain the extent of the <i>Zostera</i> -dominated community and the Mytilidae-dominated community complex, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the distinguishing community types associated with the Annex I habitat type 1130 Estuaries. Changes to the community extent and structure would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.
Community structure: <i>Zostera</i> density	Shoots/m ²	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes	
Community structure: <i>Mytilus edulis</i> density	Individuals/m ²	Conserve the high quality of the Mytilidae-dominated community complex, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the <i>Mytilus edulis</i> which is associated with the Annex I habitat type 1130 Estuaries. Changes to the number of individuals of <i>Mytilus edulis</i> would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal fine sand with <i>Peringia ulvae</i> and <i>Pygospio elegans</i> community complex; Estuarine mixed sediment to sandy mud with <i>Hediste diversicolor</i> and oligochaetes community complex; Fine sand with <i>Angulus</i> spp. and <i>Nephtys</i> spp. community complex; Sand to mixed sediment with amphipods	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the distinguishing community types associated with the Annex I habitat type 1130 Estuaries. Changes to the community distribution would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.

⁷ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.5) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		community; Intertidal reef community.	
1140 Mudflats and sandflats not covered by seawater at low tide			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	Whilst vegetation removal as part of the TDR (POI 13) will occur 0m from the SAC boundary, this habitat is not associated with or within mudflats and sandflats. The Proposed Project will not result in a loss in the extent of mudflats and sandflats. There is no potential for adverse effects.
Community extent	Occurrence	Maintain the extent of the <i>Zostera</i> -dominated community and the Mytilidae-dominated community complex, subject to natural processes.	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the community of <i>Zostera</i> . Changes to the community extent and structure would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.
Community structure: <i>Zostera</i> density	Presence/ absence of physical barriers	Maintain the extent of the <i>Zostera</i> -dominated community, subject to natural processes.	
Community structure: <i>Zostera</i> density	Shoots/m ²	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes	
Community structure: <i>Mytilus edulis</i> density	Individuals/m ²	Conserve the high quality of the Mytilidae-dominated community complex, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the <i>Mytilus edulis</i> which is associated with the Annex I habitat type 1130 Estuaries. Changes to the number of individuals of <i>Mytilus edulis</i> would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal fine sand with <i>Peringia ulvae</i> and <i>Pygospio elegans</i> community complex; Estuarine mixed sediment to sandy mud with <i>Hediste diversicolor</i> and oligochaetes community complex; Fine sand with crustaceans and <i>Scololepis (Scololepis) squamata</i> community complex; Fine sand with <i>Angulus</i> spp. and <i>Nephtys</i> spp.	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids and/or pollutants into watercourses which lead downstream to Drumcliff Estuary which could impact upon the community of <i>Zostera</i> . Changes to the community distribution would constitute an adverse effect on the integrity of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC by undermining the conservation objective for this Annex I habitat type.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
10955 Sea Lamprey (<i>Petromyzon marinus</i>)			
Distribution: extent of anadromy	% of estuary accessible	No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa	No instream works will take place within waterbodies hydrologically connected to Drumcliff Estuary. There is no potential for the Proposed Project to inhibit estuary accessibility for sea lamprey and as such there is no potential for adverse effects.
1099 River Lamprey (<i>Lampetra fluviatilis</i>)			
Distribution: extent of anadromy	% of estuary accessible	No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa	No instream works will take place within waterbodies hydrologically connected to Drumcliff Estuary. There is no potential for the Proposed Project to inhibit estuary accessibility for river lamprey and as such there is no potential for adverse effects.
1365 Harbour Seal (<i>Phoca vitulina</i>)			
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	Whilst vegetation removal as part of the TDR (POI 13) will occur 0m from the SAC boundary, No instream works or works within the estuary will not take place. The Proposed Project will therefore not result in any barriers to accessibility within Drumcliff Estuary. There is no potential for adverse effects.
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition	Whilst vegetation removal as part of the TDR (POI 13) will occur 0m from the SAC boundary, No instream works or works within the estuary will not take place. The Proposed Project will therefore not result in any disturbance to harbour seal moult and/or resting haul-out sites. There is no potential for adverse effects.
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition	
Resting behaviour	Resting haul-out sites	Conserve the resting haulout sites in a natural condition	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	Whilst vegetation removal as part of the TDR (POI 13) will occur 0m from the SAC boundary, No instream works or works within the estuary will not take place. The minor vegetation removal at POI 13 will not result in any disturbance to harbour seal. There is no potential for adverse effects.

Table 8-6: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives Cummeen Strand SPA⁸ (NPWS, 2013e)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
A046 Brent Goose <i>Branta bernicla hrota</i>			
Population trend	Percentage change	Long term population trend stable or increasing	<p>This species is known to be highly sensitive to noise and visual disturbance, with reported disturbance distances ranging from approximately 105m to 205m (Cutts <i>et al.</i>, 2013). As the N4/N15 provides a high baseline level of disturbance from traffic, it is likely that Light-bellied brent geese do not forage and roost within 350m to 400m of POI 13.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of the conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A130 Oystercatcher <i>Haematopus ostralegus</i>			
Population trend	Percentage change	Long term population trend stable or increasing	<p>Oystercatcher is considered relatively tolerant of moderate to high levels of visual disturbance and will habituate to ongoing activity (Cutts <i>et al.</i>, 2013). POI 13 is located along the N4/N15, where baseline disturbance levels are high due to traffic along the national road network. This suggests any Oystercatcher foraging/roosting in proximity of the N4/N15 are habituated to baseline levels of disturbance. The proposed clearance of vegetation and topsoil at POI 13 to facilitate the delivery of an abnormal indivisible loads along the TDR, is highly localised. No works will take place within the intertidal sand and mudflats as all works are restricted to the road network. It follows then that there is no potential for POI 13 to result in adverse effects on Oystercatcher nor adverse effects on the overall integrity of Cummeen Strand SPA in view of the conservation objectives.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of the conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	
A162 Redshank <i>Tringa totanus</i>			
Population trend	Percentage change	Long term population trend stable or increasing	<p>Redshank are very tolerant of moderate to high levels of disturbance and the species habituates to works rapidly (Cutts <i>et al.</i>, 2013). POI 13 is located along the N4/N15, where baseline disturbance levels are high due to traffic along the national road network. This suggests any Redshank foraging in proximity of the N4/N15 are habituated to high baseline disturbance events. Redshank has been observed within 1km of POI 13 (AASR, Table 10). The proposed clearance of vegetation and topsoil at POI 13 to facilitate the delivery of an abnormal indivisible loads along the TDR, is highly localised. No works will take place within the intertidal sand and mudflats as all works are restricted to the road network. This suggests any Redshank foraging/roosting in proximity of the N4/N15 are habituated to baseline disturbance levels. It follows then that there is no potential for POI 13 to</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by redshank, other than that occurring from natural patterns of variation	

⁸ Only the SCIs with potential to be affected by the Proposed Project are considered as other SCIs have been excluded (refer to Section 5.1.1.6) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			<p>result in adverse effects on Redshank nor adverse effects on the overall integrity of the Cummeen Strand SPA in view of the conservation objectives.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of the conservation objectives.</p>
A999 Wetlands			
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than 1732 hectares, other than that occurring from natural patterns of variation	In the absence of appropriate mitigation, the Proposed Project has the potential to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect downstream wetland habitats associated with this European site. Such effects could lead to a reduction in the area of these habitats and, if they were to occur, would constitute an adverse effect on the integrity of the affected European site in view of the conservation objectives.
Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
A046 Brent Goose <i>Branta bernicla hrota</i>			
Population trend	Percentage change	Long term population trend stable or increasing	<p>The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI13 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities.</p> <p>Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	
A130 Oystercatcher <i>Haematopus ostralegus</i>			
Population trend	Percentage change	Long term population trend stable or increasing	<p>The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI13 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities.</p> <p>Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	
A162 Redshank <i>Tringa totanus</i>			



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	<p>The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI13 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities.</p> <p>Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by redshank, other than that occurring from natural patterns of variation	
A999 Wetlands			
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than 1732 hectares, other than that occurring from natural patterns of variation	<p>In the absence of appropriate mitigation, the proposed development has the potential to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect downstream wetland habitats associated with this European site. Such effects could lead to a reduction in the area of these habitats and, if they were to occur, would constitute an adverse effect on the integrity of the affected European site in view of its conservation objectives.</p>

Table 8-7: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives Donegal Bay SPA⁹ (NPWS, 2012)

Attributes		Measures	Target	Potential for Adverse Effects on Site Integrity
A003 Great Northern Diver <i>Gavia immer</i>				
Population trend	Percentage change	Long term population trend stable or increasing		<p>Given the baseline level of disturbance along the N4/N15 and the presence of the intervening housing development between POI 53 and the SPA, which provides effective screening of the proposed accommodations, there is no potential for a disturbance event to Light-bellied brent geese. It follows then that there is no potential for adverse effects on SCI species or the overall integrity of the Donegal Bay SPA in view of the conservation objectives.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of Donegal Bay SPA in view of the conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Great Northern Diver, other than that occurring from natural patterns of variation		
A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i>				
Population trend	Percentage change	Long term population trend stable or increasing		<p>Given the baseline level of disturbance along the N4/N15 and the presence of the intervening housing development between POI 53 and the SPA, which provides effective screening of the proposed accommodations, there is no potential for a disturbance event to Light-bellied brent geese. It follows then that there is no potential for adverse effects on SCI species or the overall integrity of the Donegal Bay SPA in view of the conservation objectives.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of the conservation objectives.</p>
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Light-bellied Brent Goose, other than that occurring from natural patterns of variation		
A065 Common Scoter <i>Melanitta nigra</i>				
Population trend	Percentage change	Long term population trend stable or increasing		<p>Given the baseline level of disturbance along the N4/N15 and the presence of the intervening housing development between POI 53 and the SPA, which provides effective screening of the proposed accommodations, there is no potential for a disturbance event to Light-bellied brent geese. It follows then that there is no potential for adverse effects on SCI species or the overall integrity of the Donegal Bay SPA in view of the conservation objectives.</p> <p>The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids at POI 53 to downstream watercourses, which could adversely affect foraging or roosting habitats associated with the SPA. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas. This</p>
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Common Scoter, other than that occurring from natural patterns of variation		

⁹ Only the SCIs with potential to be affected by the Proposed Project are considered as other SCIs have been excluded (refer to Section 5.1.1.7) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of Donegal Bay SPA in view of the conservation objectives.			
A144 Sanderling <i>Calidris alba</i>			
Population trend	Percentage change	Long term population trend stable or increasing	Sanderling is considered extremely tolerant of human disturbance and construction activity, with reported disturbance distances ranging from approximately 6m to 50m depending on the type of stimulus (Cutts <i>et al.</i> , 2013). As the nearest works at POI 53 are located approximately 300m from the SPA, there is no potential for Sanderling to experience disturbance or displacement effects arising from the Proposed Project. It follows then that there is no potential for adverse effects on SCI species or the overall integrity of the Donegal Bay SPA in view of the conservation objectives. The Proposed Project has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of SCI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of Donegal Bay SPA in view of the conservation objectives.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Sanderling, other than that occurring from natural patterns of variation	
A999 Wetlands			
Wetland habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 10,461ha, other than that occurring from natural patterns of variation	In the absence of appropriate mitigation, the Proposed Project has the potential to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect downstream wetland habitats associated with this European site. Such effects could lead to a reduction in the area of these habitats and, if they were to occur, would constitute an adverse effect on the integrity of Donegal Bay SPA in view of the conservation objectives.
Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
A003 Great Northern Diver <i>Gavia immer</i>			
Population trend	Percentage change	Long term population trend stable or increasing	The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI 53 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Great Northern Diver, other than that occurring from natural patterns of variation	
A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i>			
Population trend	Percentage change	Long term population trend stable or increasing	The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI 53 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Light-bellied Brent Goose, other	



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		than that occurring from natural patterns of variation	Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.
A065 Common Scoter <i>Melanitta nigra</i>			
Population trend	Percentage change	Long term population trend stable or increasing	The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI 53 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Common Scoter, other than that occurring from natural patterns of variation	
A144 Sanderling <i>Calidris alba</i>			
Population trend	Percentage change	Long term population trend stable or increasing	The proposed development has the potential, in the absence of mitigation, to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect foraging or roosting habitats associated with this downstream European site. In addition, due to the proximity of the SPA to POI 53 along the TDR and the limited availability of visual screening, there is potential for disturbance or displacement effects within the SPA during construction activities. Such effects could result in a reduction in the availability, area, or distribution of suitable habitat, or lead to the displacement of QI species from otherwise suitable areas. This could, in turn, affect population trends or spatial distribution within the SPA and would therefore constitute an adverse effect on the integrity of the site in view of its conservation objectives.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Sanderling, other than that occurring from natural patterns of variation	
A999 Wetlands			
Wetland habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 10,461ha, other than that occurring from natural patterns of variation	In the absence of appropriate mitigation, the proposed development has the potential to result in a temporary degradation of water quality through the release of suspended solids to downstream watercourses, which could adversely affect downstream wetland habitats associated with this European site. Such effects could lead to a reduction in the area of these habitats and, if they were to occur, would constitute an adverse effect on the integrity of the affected European site in view of its conservation objectives.

Table 8-8: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Drumcliff Bay SPA¹⁰ (NPWS, 2013f)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
[A144] Sanderling (<i>Calidris alba</i>)			
Population trend	Percentage change	Long term population trend stable or increasing	Sanderling is generally tolerant of human disturbance and construction activity, with reported disturbance distances ranging from approximately 6m to 50m depending on the type of stimulus (Cutts <i>et al.</i> , 2013). It follows then that there is no potential for POI 55 to result in a disturbance event for Sanderling nor adverse effects on the overall integrity of Drumcliff Bay SPA in view of the conservation objectives
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Sanderling, other than that occurring from natural patterns of variation	
[A157] Bar-tailed Godwit (<i>Limosa lapponica</i>)			
Population trend	Percentage change	Long term population trend stable or increasing	This species has a moderate tolerance of human disturbance and construction activity, with reported disturbance distances ranging from 200 to 300m (Goodship and Furness, 2022). However, it is unlikely the species will be regularly foraging within 200-300m of this location due to the high levels of traffic. Furthermore, the intervening housing and Scrub (WS1) habitat between POI 55 and the SPA likely provides effective screening to prevent a significant disturbance event. It follows then that there is no potential for POI 55 to result in a disturbance event for Bar-tailed godwit nor adverse effects on the overall integrity of Drumcliff Bay SPA in view of the conservation objectives.
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Bar-tailed Godwit, other than that occurring from natural patterns of variation	

¹⁰ Only the SCIs with potential to be affected by the Proposed Project are considered as other SCIs have been excluded (refer to Section 5.1.1.8) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Table 8-9: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Glenade Lough SAC (NPWS, 2021b)¹¹

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	As stated in the conservation objectives, lake surface area is the simplest measure of extent and should be stable or increasing (see also vegetation distribution attribute below). As there is no potential pathway for the Proposed Project to lead to changes in the lake surface area and as such there will be no resulting adverse effects.
Habitat distribution	Occurrence	No decline, subject to natural processes	Glenade Lough SAC is suffering from eutrophication which is leading to changes in vegetation composition (NPWS, 2021b). Pollution of groundwater from various activities including agricultural, forestry, residential and commercial are all listed as identified threats/pressures to the Annex I habitat (NPWS, 2025e). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the distribution of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: species richness	Occurrence	Maintain/restore appropriate species richness	A total of 16 plant species have been recorded in Glenade Lough (NPWS, 2021b). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the vegetation composition of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: typical species	Occurrence	Restore typical species, in good condition, and demonstrating typical abundances and distribution	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the vegetation composition of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the vegetation distribution of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation distribution: characteristic zonation	Occurrence	Restore characteristic deep-water vegetation	The characteristic 3 zone zonation is the restoration target for this QI with the deep-water community is the most sensitive element of the vegetation zones. In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the vegetation zones of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation distribution: maximum (eutrophic) depth	Metres	Restore maximum depth of vegetation, subject to natural processes	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for adverse effects on the vegetation distribution of the Annex I habitat type within the SAC, if contaminated groundwater was to discharge at these locations. This constitutes potential for

¹¹ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.9) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	Dewatering at T11 has potential to lead to changes in groundwater flow and/or drawdown of the water table. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	The substratum of Glenade Lough is sand and stone in the shallows, mud in deeper water (NPWS, 2021b). There is no potential pathway for the Proposed Project to lead to changes in the substratum quality of Glenade Lough and as such there will be no resulting adverse effects.
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat	Water colour controls light penetration and as a result indirectly controls eutrophic depth and the extent of vegetation. The primary source of increased colour is drainage of peatlands and as such there is no potential pathway for the Proposed Project to lead to changes in water colour.
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact DOC levels, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity refers to the cloudiness of water caused by suspended solids. It determines light penetration and as such indirectly controls the eutrophic depth and the extent of vegetation. As there is no hydrological connectivity between the SAC and the Proposed Project, there is no potential for sediment laden surface water runoff to discharge into the lake.
Transparency	Metres	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency determines light penetration and as such indirectly controls the eutrophic depth and the extent of vegetation. Hydrocarbons can reduce transparency through surface films and emulsions. In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact transparency, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Attached algal biomass	Algal cover	Maintain/restore trace/absent attached algal biomass (<5% cover)	Hydrocarbon release may indirectly promote algal blooms by altering the biochemistry of the lake. In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of the habitat	A band of fringe vegetation flanks the shores of the lake, including groundwater dependent habitats such as fens and flushes (NPWS, 2021b). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater dependent fringing habitats if the contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
1833 Slender Naiad <i>Najas flexilis</i>			
Population extent	Hectares; distribution	Restore the spatial extent of slender naiad (<i>Najas flexilis</i>) within the lake, subject to natural processes	The species has not been seen at Glenade Lough since 1978 and is considered locally extinct (NPWS, 2021b). Groundwater contamination from agriculture, forestry, and commercial activities are listed as threats/pressures to the species (NPWS, 2025e).



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Population depth	Metres	Restore the depth range of <i>Najas flexilis</i> within the lake, subject to natural processes	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact the restoration potential of the lake for slender naiad. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Population viability	Plant traits	Restore plant fitness, subject to natural processes	
Population abundance	Square metres	Restore the cover abundance of <i>Najas flexilis</i> , subject to natural processes	
Species distribution	Occurrence	Restore distribution, subject to natural processes	
Habitat extent	Hectares	Restore habitat extent, subject to natural processes	
Vegetation distribution: maximum (euphotic) depth	Metres	Maintain/restore maximum depth of vegetation, subject to natural processes	
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat for the species	
Lake substratum quality	Various	Maintain/restore appropriate substratum type, extent and chemistry to support a population of the species	The substratum of Glenade Lough is sand and stone in the shallows, mud in deeper water (NPWS, 2021b). There is no potential pathway for the Proposed Project to lead to changes in the substratum quality of Glenade Lough and as such there will be no resulting adverse effects.
Nutrients	mg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support a population of the species	There is no potential for adverse effects on the soil pH and nutrient levels as a result of the Proposed Project, as in the unlikely event of a contamination of Glencar GWB, pollution from hydrocarbons will not alter pH or nutrient status of peatland soils.
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support a population of <i>Najas flexilis</i>	Water colour controls light penetration and as a result indirectly controls eutrophic depth and the extent of vegetation. The primary source of increased colour is drainage of peatlands and as such there is no potential pathway for the Proposed Project to lead to changes in water colour.
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact DOC levels, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support a population of <i>Najas flexilis</i> , subject to natural processes	Acidification is a significant threat to slender naiad. There is no potential pathway for the Proposed Project to lead to changes in the acidification status of Glenade Lough and as such there will be no resulting adverse effects.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Associated species	Species composition and abundance	Restore appropriate associated species and vegetation communities to support a population of <i>Najas flexilis</i>	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact the vegetation composition of the lake, if contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glendade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of the habitat	A band of fringe vegetation flanks the shores of the lake, including groundwater dependent habitats such as fens and flushes (NPWS, 2021b). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater dependent fringing habitats if the contaminated groundwater was to discharge at these locations. This constitutes potential for adverse effects on the integrity of Glendade Lough SAC by undermining the conservation objective for the Annex I habitat type.
1092 White-clawed crayfish (<i>Austropotamobius pallipes</i>)			
Distribution	Number of occupied 1km squares	No reduction from baseline	All the records of the species have come from the accessible eastern shoreline in the 1km square G8345, which is c. 7.7km north-west of the proposed Wind Farm Site at nearest distance, although it is assumed the species is present elsewhere in the lake (NPWS, 2021b). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater quality and as such the distribution of white-clawed crayfish, if the contaminated groundwater was to discharge into Glendade Lough. This constitutes potential for adverse effects on the integrity of Glendade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries	In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater quality and as such population structure of white-clawed crayfish, if the contaminated groundwater was to discharge into Glendade Lough. This constitutes potential for adverse effects on the integrity of Glendade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Population size	Catch per unit effort	No reduction from baseline	The local population is ranked as having a population abundance grade of Moderate to High (NPWS, 2021b). In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater quality and as such population size of white-clawed crayfish, if the contaminated groundwater was to discharge into Glendade Lough. This constitutes potential for adverse effects on the integrity of Glendade Lough SAC by undermining the conservation objective for the Annex I habitat type.
Negative indicator species	Occurrence	No non-indigenous crayfish species	Non-indigenous crayfish species are considered a major threat to native populations as they are vectors for the crayfish plague (<i>Aphanomyces astaci</i>) which results in mortality of white-clawed crayfish (NPWS, 2021b). There is no potential pathway for the introduction of non-native crayfish species into Glendade Lough SAC as a result of the Proposed Project.
Disease	Occurrence	No instances of disease	Crayfish plague (<i>Aphanomyces astaci</i>) is a water borne mould which has caused local extinction events of white-clawed crayfish (NPWS, 2021b). There is no potential pathway for the introduction of non-native crayfish species into Glendade Lough SAC as a result of the Proposed Project.
Water quality	Water chemistry measures	Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	The water quality targets for the Annex I 3130 lake habitat are more stringent than white-clawed crayfish require. While the accidental release of hydrocarbons into the Glencar GWB, would not directly result in a change to pH or nutrient levels of the lake it would likely lead to indirect degradation of water quality disrupting the natural structure and functioning of the habitat. In the unlikely event of contamination of Glencar GWB through site excavations in the west of the proposed Wind Farm Site, there is potential for the release of hydrocarbons to impact groundwater quality and as such



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			<p>population size of white-clawed crayfish, if the contaminated groundwater was to discharge into Glendade Lough. This constitutes potential for adverse effects on the integrity of Glenade Lough SAC by undermining the conservation objective for the Annex I habitat type.</p>
<p>Habitat quality: heterogeneity</p>	<p>Occurrence of positive habitat features</p>	<p>No decline from the baseline</p>	<p>Habitat heterogeneity at Glenade Lough SAC is between 0.32 and 0.48 in this SAC (NPWS, 2021b). Habitat heterogeneity is important for supporting population dynamics as the species is dependent on a variety of habitat requirements (stones/gravel/earthen banks) throughout its life cycle. There is no potential pathway for the removal of suitable habitat from Glenade Lough SAC as a result of the Proposed Project.</p>

Table 8-10: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Lough Derg (Donegal) SPA (NPWS, 2025h)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
A183 Lesser Black-backed Gull <i>Laus fuscus</i>			
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	The largest breeding colony of Lesser black-backed gull in Ireland was identified on Inishgoosk Island in Lough Derg, Co. Donegal in 1977 and surveyed in 1999 (NPWS, 2025h). However, breeding Lesser Black-backed gulls have not been recorded at this site in subsequent years. As breeding populations have not been observed at this site since 1999, it can be assumed that there is no functional link between the SPA population and the Lesser black-backed gull observed during field surveys at the proposed Wind Farm Site. It has been suggested that the closure of a nearby landfall lead the breeding colony to abandon the site (NPWS, 2025h). Local populations can scavenge on landfills and become dependent on such for food. Nationally, the breeding population has increased by 163% between national surveys in 1998 - 2002 and 2015 - 2021. There is no potential for the proposed Wind Farm Site to result in adverse effects on the breeding population size of Lesser Black-backed gull at Lough Derg (Donegal) SPA.
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	No productivity data exists for the species at this SPA (NPWS, 2025h). It can be assumed that, if no breeding pairs use the SPA then the productivity rate is zero. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the productivity rate of Lesser black-backed gull at Lough Derg (Donegal) SPA.
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution describes the suitable nesting habitat for the breeding population (NPWS, 2025h). As no works are scheduled for Inishgoosk Island, it follows then that there will be no adverse effects on the availability of suitable nesting habitat for the species within the SPA. There is no potential for the proposed Wind Farm Site to result in adverse effects on the distribution of nesting sites for Lesser Black-backed gull at Lough Derg (Donegal) SPA.
Forage spatial distribution, extent, abundance and availability	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Lesser black-backed gull are opportunistic feeders, foraging both terrestrial and aquatic habitats. The maximum recorded foraging distance from nesting sites for the species is 553km with the mean of the maximum foraging distances being 127km. The overall mean foraging distance for the species is 43km, which puts Lough Derg SPA within the potential Zol for the proposed Wind Farm Site, which is located c. 31km away (NPWS, 2025h). However, given that no breeding Lesser Black-backed gull has been identified at Lough Derg (Donegal) SPA since 1999, there is no functional link between the SPA and the proposed Wind Farm Site. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Lesser black-backed gull at Lough Derg (Donegal) SPA.
Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	The SPA is located c. 31km north-east proposed Wind Farm Site at nearest distance. No works are proposed within the SPA. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Lesser black-backed gull at Lough Derg (Donegal) SPA as a result of disturbance.
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	The SPA is located c. 31km north-east proposed Wind Farm Site at nearest distance. No works are proposed within the SPA. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Lesser black-backed gull at Lough Derg (Donegal) SPA as a result of disturbance.
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Lesser black-backed gull are opportunistic feeders, foraging both terrestrial and aquatic habitats. The maximum recorded foraging distance from nesting sites for the species is 553km with the mean of the maximum foraging distances being 127km. The overall mean foraging distance for the species is 43km, which puts Lough Derg SPA within the potential Zol for the proposed Wind Farm Site, which is located c. 31km away (NPWS, 2025h). However, given that no breeding Lesser Black-backed gull has been identified at Lough Derg (Donegal) SPA since 1999, there is no functional link between the SPA and the



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			proposed Wind Farm Site. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Lesser black-backed gull at Lough Derg (Donegal) SPA as a result of barriers to connectivity.
A184 Herring Gull <i>Larus argentatus</i>			
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	A colony of an estimated 100 pairs of nesting gulls was identified on Inishgoosk Island in Lough Derg, Co. Donegal in 1977 and surveyed in 1999 (NPWS, 2025h). However, breeding Herring gulls have not been recorded at this site in subsequent survey years. As breeding populations have not been observed at this site since 1999, it can be assumed that there is no functional link between the SPA population and the Herring gulls observed during field surveys at the proposed Wind Farm Site. It has been suggested that the closure of a nearby landfall lead the breeding colony to abandon the site (NPWS, 2025h). Local populations can scavenge on landfills and become dependent on such for food. Nationally, the breeding population of gulls has increased by 94% between national surveys in 1998 - 2002 and 2015 - 2021. There is no potential for the proposed Wind Farm Site to result in adverse effects on the breeding population size of Herring gull at Lough Derg (Donegal) SPA.
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	No productivity data exists for the species at this SPA (NPWS, 2025h). It can be assumed that, if no breeding pairs use the SPA, then the productivity rate is zero. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the productivity rate of Herring gull at Lough Derg (Donegal) SPA.
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution describes the suitable nesting habitat for the breeding population (NPWS, 2025h). As no works are scheduled for Inishgoosk Island, it follows then that there will be no adverse effects on the availability of suitable nesting habitat for the species within the SPA. There is no potential for the proposed Wind Farm Site to result in adverse effects on the distribution of nesting sites for Herring gull at Lough Derg (Donegal) SPA.
Forage spatial distribution, extent, abundance and availability	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Herring gull are opportunistic feeders, foraging both terrestrial and aquatic habitats. The maximum recorded foraging distance from nesting sites for the species is 92km with the mean of the maximum recorded foraging distances being 59km. The overall mean foraging distance for the species is 15km. This puts Lough Derg SPA within the potential Zol for the proposed Wind Farm Site, which is located c. 31km away (NPWS, 2025h). However, given that no breeding Herring gull has been identified at Lough Derg (Donegal) SPA since 1999, there is no functional link between the SPA and the proposed Wind Farm Site. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Herring gull at Lough Derg (Donegal) SPA.
Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	The SPA is located c. 31km north-east proposed Wind Farm Site at nearest distance. No works are proposed within the SPA. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Herring gull at Lough Derg (Donegal) SPA as a result of disturbance.
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	The SPA is located c. 31km north-east proposed Wind Farm Site at nearest distance. No works are proposed within the SPA. It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Herring gull at Lough Derg (Donegal) SPA as a result of disturbance.
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Herring gull are opportunistic feeders, foraging both terrestrial and aquatic habitats. The maximum recorded foraging distance from nesting sites for the species is 553km with the mean of the maximum foraging distances being 127km. The overall mean foraging distance for the species is 43km, which puts Lough Derg SPA within the potential Zol for the proposed Wind Farm Site, which is located c. 31km away (NPWS, 2025h). However, given that no breeding Herring gull has been identified at Lough Derg (Donegal) SPA since 1999, there is no functional link between the SPA and the proposed Wind Farm Site.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			It follows then, that there is no potential for the proposed Wind Farm Site to result in adverse effects on the SPA population of Herring gull at Lough Derg (Donegal) SPA as a result of barriers to connectivity.

Table 8-11: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Lough Gill SAC (NPWS, 2021f)¹²

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharitum</i> - type vegetation			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. As such, there is potential for a reduction in the area of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline, subject to natural processes	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. As such, there is potential for a reduction in the distribution of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: species richness	Occurrence	Maintain/restore appropriate species richness	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. As such, there is potential for a reduction in the vegetation composition of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: typical species	Occurrence	Restore typical species, in good condition, and demonstrating typical abundances and distribution	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. As such, there is potential for a reduction in the restoration potential for vegetation composition in good condition, abundance, and distribution of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Within Lough Gill SAC the vegetation zones/communities are yet to be fully described. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. As such, there is potential for a reduction in the characteristic zonation for vegetation composition of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons has the potential to reduce light penetration and maximum depth of vegetation. As such, there is potential for a reduction in the distribution of the Annex I habitat type within the SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	No abstraction is proposed from Lough Gill or from any hydrologically connected watercourses as part of the Proposed Project. As such, there is no potential pathway for the Proposed Project to lead to changes in the water level fluctuations of Lough Gill SAC. There is no potential for adverse effect effects.
Lake substratum quality	Various	Maintain appropriate substratum type, extent	The substratum of Lough Gill is sand and stone in the shallows, mud in deeper water (NPWS, 2021b). No interference with the substratum of Lough Gill SAC is proposed as part of the Proposed Project. There is no potential pathway for the Proposed Project to lead to changes in the substratum quality of Lough Gill SAC and as such there will be no resulting adverse effects.

¹² Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 0) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		and chemistry to support the vegetation	
Transparency	Metres	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency determines light penetration and as such indirectly controls the eutrophic depth and the extent of vegetation. Siltation and the release of hydrocarbons can reduce transparency through surface films, emulsions, and suspended solids. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to reduce light penetration and maximum depth of vegetation. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Nutrients	mg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support a population of the species	Levels of nitrogen/ammonia and phosphorus are associated with agricultural inputs and artificial fertilizers. No fertilizers will be used as part of the Proposed Project. As such there is no potential for adverse effects on the nutrient levels within the SAC as a result of the Proposed Project.
Phytoplankton biomass	µg/l chlorophyll a	Maintain appropriate water quality to support the habitat, including high chlorophyll a status	The annual average chlorophyll a concentration must be <5.8 µg/l. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to disrupt phytoplankton biomass within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to disrupt phytoplankton composition within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Attached algal biomass	Algal cover	Maintain/restore trace/absent attached algal biomass (<5% cover)	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to disrupt algal biomass within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Macrophyte status	EPA macrophyte metric (The Free Index)	Restore high/good macrophyte status	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to disrupt macrophyte status within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Acidification status	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation has the potential to impact the pH (units mg/l) within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation has the potential to impact the water colour of Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation and the release of hydrocarbons have the potential to reduce for the release of hydrocarbons to impact DOC levels, within Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC. Siltation has the potential to impact turbidity of Lough Gill SAC. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of the habitat	There is a diversity of fringing habitat surrounding Lough Gill, some of which are susceptible to reduction in water quality such as alluvial woodlands and marsh (NPWS, 2021f). Siltation and contamination of watercourses have the potential to impact the occurrence and distribution of these habitats. This constitutes potential for adverse effects on the integrity of Lough Gill SAC .
[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>);			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The area of the Annex I habitat type within the SAC is estimated to be 55.3ha. The Annex I habitat type is located at the “mouth of the River Bonet”. The NPWS mapping does not include this location and only the Annex I habitat type 91A0 Old sessile oak woods is located where the River Bonet discharges into Lough Gill. The habitat also occurs along the Garavogue River, but this location is beyond the ZoI of the Proposed Project as it is beyond the depositional water body Lough Gill (NPWS, 2021f). A parcel of the Annex I habitat type is located along the banks of the River Bonet at NPWS Site 371. In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the Annex I habitat type as the habitat area has potential to be reduced within the SAC through the indirect mortality of trees and shrubs. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Habitat distribution	Occurrence	No decline, subject to natural processes. The surveyed woodland locations are shown on	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the Annex I habitat type as the habitat distribution has potential to be reduced within the SAC through the indirect mortality of trees and shrubs. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the Annex I habitat type as the woodland size has potential to be reduced within the SAC through the indirect mortality of trees and shrubs. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm;	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the Annex I habitat type as the woodland structure (cover and height) has potential to be disrupted through the indirect mortality of trees and shrubs. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		bryophyte cover at least 4%	
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on woodland structure (community diversity and extent) through the indirect mortality of vegetation Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the woodland structure (regeneration potential) through the indirect mortality of vegetation within the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Hydrological regime: flooding depth/height of water table	Meters	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river and lake floodplains (NPWS, 2021f). Significant siltation of upstream watercourses constitutes a pathway for adverse effects on the hydrological regime associated with the Annex I habitat. In the absence of mitigation, siltation of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR, constitutes a pathway for potential adverse effects on the hydrological regime which supports the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	There is no potential for the Proposed Project to impact volume of deadwood within the SAC.
Woodland structure: veteran trees	Number per hectare	No decline	Veteran trees support a diversity of woodland species and important ecological niches (NPWS, 2021f). In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the number per hectare of veteran trees as a result of the indirect mortality of vegetation within the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the woodland structure (local distinctiveness) through the indirect mortality of vegetation within the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Woodland structure: indicators of overgrazing	Occurrence; population size	No decline in distribution and, in the case of red listed and other rare or localised species, population size	There is no potential for the Proposed Project to impact grazing rates within the SAC.
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on native trees within the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		cover at least 50% of canopy	
Vegetation composition: typical species	Occurrence	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase either within the proposed Wind Farm Site or along the proposed GCR constitutes a pathway for potential adverse effects on the number of positive indicator species. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Several negative indicator species were identified in the habitat within Lough Gill SAC, namely; non-native red-osier dogwood (<i>Cornus sericea</i>), rhododendron (<i>Rhododendron ponticum</i>) cherry laurel (<i>Prunus laurocerasus</i>), and horse-chestnut (<i>Aesculus hippocastanum</i>). In the absence of mitigation, siltation and/or contamination of watercourses during the construction phase, either within the proposed Wind Farm Site or along the proposed GCR, constitutes a pathway for potential adverse effects on the vegetation composition through a reduction in native species and a subsequent increase in non-native species within the Annex I habitat type. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the Annex I habitat type.
Vegetation composition: problematic native species	Percentage	Cover of common nettle (<i>Urtica dioica</i>) less than 75%	Where common nettle (<i>Urtica dioica</i>) becomes dominant within the habitat type it is often as a result of nutrient enrichment (NPWS, 2021f). There is no potential for the Proposed Project to lead to nutrient enrichment within the Annex I habitat type.
[1092] White-clawed crayfish (<i>Austropotamobius pallipes</i>)			
Distribution	Occurrence	No reduction from baseline	The main population of white-clawed crayfish within Lough Gill is found in the Bonet River. The species has been identified within the main channel of the Bonet from Dromahair upstream to Glenade Lough (which is in an adjoining SAC) as well as the Shanvaus and Owenmore rivers. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). Deterioration in water quality has the potential to impact the distribution of the species. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). Deterioration in water quality has the potential to impact the population structure and recruitment of the species. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Population size	Catch per unit effort	No reduction from baseline of 0.25	The abundance grade for the local population is considered low except for the upper reaches of the Bonet River (NPWS, 2021f). In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). Deterioration in water quality has the potential to impact the population size. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Negative indicator species	Occurrence	No alien crayfish species	There will be no in-stream works proposed within the proposed Wind Farm Site or along the GCR and/or within Lough Gil SAC. As such, there is no potential for the introduction of alien crayfish species.
Disease	Occurrence	No instances of disease	There will be no in-stream works proposed within the proposed Wind Farm Site or along the GCR and/or within Lough Gil SAC. As such, there is no potential for the introduction of crayfish plague, which is a water borne mould, which can be transmitted through contaminated equipment and has been responsible for local extinction events.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
River water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . In short, siltation and contamination have potential to impact river water quality. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Lake water quality	Water chemistry measures	Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . In short, siltation and contamination have potential to impact lake water quality. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline from the baseline	Habitat heterogeneity is important for supporting population dynamics as the species is dependent on a variety of habitat requirements (stones/gravel/earthen banks) throughout its life cycle. There is no potential pathway for the removal of suitable habitat from Lough Gill SAC as a result of the Proposed Project.
Sea Lamprey (<i>Petromyzon marinus</i>)			
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	Records exist for sea lamprey in Lough Gill SAC are sparse, likely due to natural waterfalls in Dromahair, which create a barrier to upstream migrations. All works for the Proposed Project will take place upstream of Dromahair. There are no in-stream works proposed along the GCR. There is no potential pathway for the Proposed Project to create barrier to migration for sea lamprey.
Annual run size	Number of sea lamprey nets	Annual run size should reflect that expected under near-natural conditions	Identified suitable spawning habitat for sea lamprey in Lough Gill SAC is the along the Garavogue River as it passes through in Sligo town and along the River Bonet downstream of Dromahair. All works for the Proposed Project will take place upstream of Dromahair. There are no in-stream works proposed along the GCR. There is no potential pathway for the Proposed Project to impact the number of sea lamprey nests/annual run size.
Larval lamprey in fine sediment	Larval lamprey/m ²	Larval lamprey present in SAC catchment	Records exist for sea lamprey in Lough Gill SAC are sparse, likely due to natural waterfalls in Dromahair, which create a barrier for sea lamprey migrations (NPWS, 2021f). All works for the Proposed Project will take place upstream of Dromahair. There are no in-stream works proposed along the GCR. There is no potential pathway for the Proposed Project to directly impact populations of larval lamprey present in the SAC catchment. However, in the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . Siltation and contamination have potential to impact river water quality which may in turn negatively impact downstream, populations of sea lamprey. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Extent and distribution of spawning and nursery habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	In order to spawn, sea lampreys excavate large nests in well oxygenated gravels. Identified suitable spawning habitat for sea lamprey in Lough Gill SAC is the along the Garavogue River as it passes through in Sligo town and along the River Bonet downstream of Dromahair. All works for the Proposed Project will take place upstream of Dromahair. There are no in-stream works proposed along the GCR. There is no potential pathway for the Proposed Project to impact the extent and distribution of spawning beds within Lough Gill SAC.
[1096] Brook Lamprey (<i>Lampetra planeri</i>)			
Distribution	% of river accessible	Access to all watercourses down to first order streams	Artificial barriers can impede upstream migration for brook lamprey, but this is not considered an issue in Lough Gill SAC (NPWS, 2021f). There is no potential pathway for the Proposed Project to prevent access to watercourses. There is no potential pathway for the Proposed Project to prevent access to watercourses.
Population structure of larvae	Number of age/size classes	At least three age/size groups of brook/river lamprey present	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . Siltation and contamination have potential to impact river



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			water quality which may in turn negatively impact downstream, populations of sea lamprey. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Larval lamprey in fine sediment	Larval lamprey/m ²	Mean catchment juvenile density of brook/river lamprey at least 5/m ²	There are no in-stream works proposed along the GCR and as such no potential loss of larval habitat. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . Siltation and contamination have potential to impact river water quality which may in turn negatively impact downstream, populations of sea lamprey. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Brook lamprey spawn in clean gravels where they excavate shallow nests. There are no in-stream works proposed along the GCR and as such no potential loss of habitat. There is no potential pathway for the Proposed Project to result in the decline in extent and distribution of spawning beds.
[1099] River lamprey (<i>Lampetra fluviatilis</i>)			
Distribution	% of river accessible	Access to all watercourses down to first order streams	There are no records for adult river lamprey in the Garavogue-Bonet river system. Artificial barriers can impede upstream migration for river lamprey, but this is not considered an issue in Lough Gill SAC (NPWS, 2021f). There are no in-stream works proposed along the GCR. There is no potential pathway for the Proposed Project to prevent access to watercourses.
Population structure of larvae	Number of age/size classes	At least three age/size groups of brook/river lamprey present	In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . Siltation and contamination have potential to impact river water quality which may in turn negatively impact downstream, populations of river lamprey. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Larval lamprey in fine sediment	Larval lamprey/m ²	Mean catchment juvenile density of brook/river lamprey at least 5/m ²	There are no in-stream works proposed along the GCR and as such no potential loss of larval habitat. In the absence of mitigation, the felling of forestry and vegetation removal within the proposed Wind Farm Site will likely lead to siltation of downstream waterbodies inclusive of Lough Gill SAC and the Bonet River (Garavogue_010, Bonet_050, Bonet_030, Bonet_040, Owenmore (Manorhamilton)_020, Brackary_010). . Siltation and contamination have potential to impact river water quality which may in turn negatively impact downstream, populations of river lamprey. This constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the QI species.
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	River lamprey spawn in clean gravels where they excavate shallow nests. There are no in-stream works proposed along the GCR and as such no potential loss of habitat. There is no potential pathway for the Proposed Project to result in the decline in extent and distribution of spawning beds.
[1106] Atlantic salmon (<i>Salmo salar</i>)			
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	Upstream migration is essential in the life cycle of Atlantic salmon and artificial barriers to migration restrict access to upstream spawning areas (NPWS, 2021f). No instream works will be undertaken along the GCR or within the SAC and no barriers to salmon migration will be implemented within SAC watercourses. There is no potential for the Proposed Project to inhibit accessibility through river channels within the SAC therefore, there is no potential for adverse effects.
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	The Proposed Project has the potential to result in the degradation of water quality and habitat, which could result in further impacts on the waterbodies within Lough Gill SAC. A decrease in adult spawning fish constitutes a pathway for potential adverse effect on the integrity of the SAC.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold	Crisp (2000) notes that 'salmon spawning site selection is governed by complex environmental factors, which are all essential for successful spawning, egg survival and hatching, including intra-gravel flow, gravel size, water depth, as well as stream velocity and cover' and that 'one of the most important factors for salmon egg survival is oxygen supply, which is dependent upon



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		value. Currently set at 17 salmon fry/5 min sampling	dissolved oxygen concentration and inter-gravel flow'. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material. The release of suspended solids and/or pollution has the potential to impact spawning sites which constitutes a pathway for adverse effects on the integrity of the SAC.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	
Out-migrating smolt abundance	Number	No significant decline	No instream works will be undertaken within the SAC and no barriers to migration will be implemented within the SAC. The Proposed Project will therefore not inhibit smolt out migration. There is no potential for adverse effects on out-migrating smolt abundance.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	The Proposed Project has the potential to result in the degradation of water quality within the SAC, which could result in further impacts on the waterbodies within Lough Gill SAC The degradation of water quality due to the Proposed Project constitutes a pathway for potential adverse effects on the water quality status of all downstream sites sampled by the EPA. A degradation in water quality constitutes a pathway for adverse effects on the integrity of the SAC.
European otter (<i>Lutra lutra</i>)			
Distribution	Percentage positive survey sites	No significant decline	Trenching works along the GCR especially those within 20-150m (NRA, 2008a) of watercourses within the SAC, as well as HDD Site 1 and 2, constitute potential for adverse effects on the distribution of European otter as a result of disturbance from noise, vibration, lighting, human activity. The temporary displacement of European otter due to the trenching and HDD works proposed along the GCR constitutes a pathway for potential adverse effect on the integrity of the SAC.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 193.91ha along river banks/ lake shoreline/around ponds	The extent of terrestrial habitat for European otter is calculated using a standard 10m buffer around all waterbodies within the SAC, inclusive of rivers, lakes and ponds (NPWS, 2021f). One of the launch pits for HDD Site 1 is located within the boundaries of the SAC, where c. 10m of Hedgerow (WL1) will be removed. This vegetation removal is >50m from the nearest watercourse (Bonet_030). As such, the loss of habitat will take place beyond the mapped extent of the terrestrial habitat for European otter. There is no potential for adverse effects on the integrity of the SAC as a result of a decline in the extent of terrestrial habitat.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 80.38km	European otter will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982). No decline in the extent of freshwater habitat will occur as a result of the Proposed Project. There is no potential for adverse effects on the integrity of the SAC as a result of a decline in the extent of freshwater (river) habitat.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha	European otter tend to forage within 80m of lake shorelines (NPWS, 2021f). No decline in the extent of lake shoreline habitat will occur as a result of the Proposed Project. There is no potential for adverse effects on the integrity of the SAC as a result of a decline in the extent of freshwater (lake) habitat.
Couching sites and holts	Number	No significant decline	No holts or couching sites were recorded within the Proposed Project, or within watercourses (150 m downstream) of the Proposed Project. However, there is potential for holts to be identified during pre-construction confirmatory surveys. As such, there is potential for a loss in the number of couching sites and holts as a result of the proposed GCR. A loss of couching sites and holts would therefore constitute an adverse effect on the integrity of the SAC.
Fish biomass available	Kilograms	No significant decline	The potential degradation of water quality within the River Bonet as a result of construction phase activities within the proposed Wind Farm Site, which is located upstream, constitutes potential for a significant decline in the availability of fish biomass to European otter. A decline in fish biomass availability constitutes potential for adverse effects on the integrity of Lough Gill SAC by undermining the conservation objective for the European otter.
Barriers to connectivity	Number	No significant increase.	The otter commuting habitat is considered up to 500m of open water in Lough Gill to allow commuting between islands (NPWS, 2021f). There will be no obstruction to the open water habitat within Lough Gill as a result of the Proposed Project as no works



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			are scheduled to take place within the lake. There is no potential for adverse effects on the integrity of the SAC as a result of an increase in barriers to connectivity for European otter.

Table 8-12: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Lough Melvin SAC (NPWS, 2021e)¹³

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea			
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact the species richness associated with this habitat type. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would result in a change in the area, distribution and alterations to species/vegetation. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex I habitat type.
Habitat distribution	Occurrence	No decline, subject to natural processes	
Vegetation species richness	Occurrence	Restore appropriate species richness	
Vegetation composition: typical species	Occurrence	Restore typical species, in good condition, and demonstrating typical abundances and distribution	
Vegetation composition: characteristic zonation	Occurrence	Restore characteristic deep-water vegetation	
Vegetation distribution: maximum (euphotic) depth	Metres	Restore maximum depth of vegetation, subject to natural processes	
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	No instream works will take place along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary. There is no potential for the Proposed Project to result in changes to the hydrological regime and as such there is no potential for adverse effects.
Lake substratum quality	Various	Maintain/restore appropriate substratum type, extent and chemistry to support the vegetation	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact the lake substratum. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would impact upon the lake substratum. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex I habitat type.
pH and Alkalinity	pH units, mg/l	Maintain/restore appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would impact upon pH and alkalinity, nutrient levels, water colour, DOC, turbidity and transparency of the lake waterbody. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex I habitat type.
Nutrients	mg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to	

¹³ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.12) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
		support the habitat and its typical species	
Water colour	mg/l PtCo	Restore appropriate water colour to support the habitat	
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate unit	Maintain/restore appropriate turbidity to support the habitat	
Transparency	Metres	Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	
Attached algal biomass	Algal cover	Maintain trace/absent attached algal biomass (<5% biomass)	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would impact upon algal cover within the lake and has the potential to result in algal blooms. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex I habitat type.
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130	No works as part of the Proposed Project will take place within the SAC boundary. There is no potential for the Proposed Project to result in changes to the fringing habitat and as such there is no potential for adverse effects.
1106 Salmon (<i>Salmo salar</i>)			
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	No instream works are proposed along river waterbodies that discharge into Lough Melvin. There is no potential for the Proposed Project to inhibit accessibility/migration through river channels, therefore, there is no potential for adverse effects.
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	The Proposed Project has the potential to result in a degradation of water quality and the release of suspended solids downstream and within the SAC. The degradation of water quality could result in further impacts on the CL of Lough Melvin SAC. A reduction in water quality could reduce the population of this species. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex II species.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Crisp (2000) notes that 'salmon spawning site selection is governed by complex environmental factors, which are all essential for successful spawning, egg survival and hatching, including intra-gravel flow, gravel size, water depth, as well as stream velocity and cover' and that 'one of the most important factors for salmon egg survival is oxygen supply, which is dependent upon dissolved oxygen concentration and inter-gravel flow'. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	The release of suspended solids and/or pollution has the potential to impact spawning sites which would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex II species.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Out-migrating smolt abundance	Number	No significant decline	No instream works are proposed along river waterbodies that discharge into Lough Melvin and no works will take place within the SAC boundary. The Proposed Project will therefore not inhibit smolt out migration. There is no potential for adverse effects on out-migrating smolt abundance.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. The degradation of water quality could prevent the watercourses which drain the Proposed Project from maintaining and/or achieving at least a Q4 water quality status. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex II species.
1355 Otter (<i>Lutra lutra</i>)			
Distribution	Percentage positive survey sites	No significant decline	The otter commuting buffer of 250m encompasses Melvin Lake (WFD: IE_NW_35_160). The proposed Wind Farm Site is located 6.4km downstream of the SAC and no works will take place within the SAC boundary. The Proposed Project will not result in disturbance or displacement of otter within the SAC. There is no potential for adverse effects.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 75.64ha	The Proposed Project will not result in any decline of terrestrial, marine or freshwater habitat within the SAC, as no works (including the clearance of vegetation) will occur outside the Proposed Project. There is no potential for adverse effects.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 5.87ha	
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 20.89km	
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 317.55ha	
Couching sites and holts	Number	No significant decline	The Proposed Project will not result in any loss of habitat or disturbance to otter within the SAC. There is therefore, no potential for adverse effects.
Fish biomass available	Kilograms	No significant decline	The potential degradation of water quality within watercourses draining the Proposed Project could affect the availability of fish biomass to otter. A significant pollution event from the Proposed Project could result in a decline in available feeding resources for otter which would constitute an adverse effect on the integrity of Lough Melvin SAC .
Barriers to connectivity	Number	No significant increase.	European otter will regularly commute across stretches of open water up to 500m and it is important that such commuting routes are not obstructed (NPWS, 2021e). The Proposed Project does not include works within the SAC and connectivity with the SAC will not be impacted. There is, therefore, no potential for adverse effects on the SAC.

Table 8-13: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Lough Melvin SAC NI¹⁴ (DAERA, 2015)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea			
Extent	Assessment against baseline map. Aerial photographs may be used.	No loss of extent of standing water	The Proposed Project will not take place within the SAC boundary and therefore will not result in a loss in the extent of standing water. There is no potential for adverse effects.
Composition of macrophyte community	Characteristic species composition	No loss of characteristic species present at the site	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact the macrophytes associated with this habitat type. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would result in a change to the macrophyte community. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex I habitat type.
Composition of macrophyte community	Non-native plants	Non-native species should be absent or present at low frequency. No introductions of nonnative species	The Proposed Project will not take place within the SAC boundary and no instream works proposed along river waterbodies that discharge into Lough Melvin. There is no potential for the release or introduction of non-native plant species to watercourses. There is no potential for adverse effects.
Macrophyte community structure	Distribution	Characteristic zones of vegetation should be present	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact the macrophytes associated with this habitat type. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would result in a change to the macrophyte community. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex I habitat type.
Macrophyte community structure	Extent	Maintain at least the present maximum depth distribution of <i>Isoetes</i>	
Water quality	Water Chemistry	Maintain oligotrophic/mesotrophic conditions	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would impact upon the water chemistry of the lake waterbody. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex I habitat type.
Water quality	Water Chemistry	The pH/ANC, and nutrient levels (P and N) should be stable and appropriate for the interest feature	
Hydrology	Hydrological regime	Hydrological regime	No instream works will take place along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary. There is no potential for the Proposed Project to result in changes to the hydrological regime and as such there is no potential for adverse effects.
Hydrological regime	Shore line and substrate	Maintain the natural shoreline of the lake. Substrate should be natural and characteristic of lake type.	
Sediment load	Sediment load	Minimal	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality via the

¹⁴ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.13) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
			release of suspended sediment could impede upon sediment load to the lake. This would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex I habitat type.
1106 Atlantic salmon (<i>Salmo salar</i>)			
Population dynamics	Number	Stable or increasing.	The Proposed Project has the potential to result in a degradation of water quality and the release of suspended solids downstream and within the SAC. A reduction in water quality could reduce the population of this species. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex II species.
Population dynamics	Adult Run	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality	
Population dynamics	Juvenile population densities	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality	Crisp (2000) notes that 'salmon spawning site selection is governed by complex environmental factors, which are all essential for successful spawning, egg survival and hatching, including intra-gravel flow, gravel size, water depth, as well as stream velocity and cover' and that 'one of the most important factors for salmon egg survival is oxygen supply, which is dependent upon dissolved oxygen concentration and inter-gravel flow'. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material. The release of suspended solids and/or pollution has the potential to impact spawning sites and thus juvenile population densities which would constitute an adverse effect on the integrity of Lough Melvin SAC by undermining the conservation objective for this Annex II species.
Population dynamics	Biological disturbance: Introductions	The population should be naturally self-sustaining. There should be a presumption against stocking of salmon unless it is agreed to be necessary as an emergency interim measure to maintain population viability whilst underlying ecological problems are being addressed. No introduction, or stocking, of other species, or sub-species, at excessively high densities in salmon spawning and nursery areas. Effective screening on all fish farm intakes and discharges.	The Proposed Project will not result in the introduction of these species to the SAC. There is no potential for adverse effects.
Population dynamics	Exploitation	All exploitation should be sustainable without compromising any components of the stock	The Proposed Project will not result in the exploitation of this species within the SAC. There is no potential for adverse effects.

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Physical integrity	Disturbance of habitat	No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds and smolts from reaching the sea	No instream works are proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary. The Proposed Project will not result in artificial barriers to commuting salmon. There is no potential for adverse effects.
Physical integrity	River morphology	Maintain and where necessary restore the characteristic physical features of the river channel, banks & riparian zone.	No instream works are proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary. The Proposed Project will not result in changes to river morphology. There is no potential for adverse effects.
Physical integrity	River Substrate	Clean gravels should dominate channels. <10% fines in top 30cm of spawning gravels	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact the substrate. Whilst there are no instream works proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary, a degradation in water quality would impact upon the lake substratum. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex II species.
Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year. Existing flow criteria already laid down for salmon should also be complied with.	No instream works are proposed along river waterbodies that discharge into Lough Melvin and all works will take place outside the SAC boundary. The Proposed Project will not result in changes to the flow regime. There is no potential for adverse effects.
Water quality	Biological class. Environment Protection's General Quality Assessment scheme. Assess every year.	'a'	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. The degradation of water quality could prevent the watercourses which drain the Proposed Project from maintaining and/or achieving the biological/ecosystem class targets and soluble reactive phosphorus levels. This would constitute an adverse effect on the integrity of Lough Melvin SAC NI by undermining the conservation objective for this Annex II species.
Water quality	Ecosystem Class. Environment Protection's General Quality Assessment scheme. Assess every years	'a' Targets should be set in relation to river/reach type(s) and should be near background levels)	
Water quality	Soluble Reactive Phosphorus	Annual mean <0.02mg/l – upland watercourses, <0.06mg/l mid-altitude watercourses on hard substrates and <0.2mg/l interim target for lowland rivers on clay substrates and large alluvial rivers.	



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Water quality	Pollution	None	
Water quality	Suspended solids	Annual mean	

Table 8-14: Assessment of the Potential for Adverse Effects (Pre-Mitigation) on the Conservation Objectives of Unshin River SAC¹⁵ (NPWS, 2021d)

Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
3260 Water courses of plain to montane levels with the <i>Ranuncullion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation			
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact <i>Ranuncullion fluitantis</i> and <i>Callitricho-batrachion</i> vegetation (Ní Bhroin, 2006). Impacts to the vegetation would result in a change of the area and distribution of the habitat which would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex I habitat.
Habitat distribution	Occurrence	No decline, subject to natural processes	
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	The Proposed Project will not take place within the boundary of the SAC, and it will not result in changes to the hydrological regime of rivers within the SAC. There is no potential for adverse effects.
Hydrological regime: groundwater discharge	Metres per second	Maintain appropriate hydrological regime	The southern extent of the proposed GCR is located within the same GWB as two sections of this SAC, namely Lavagh-Ballintougher (IE_WE_G_0038) and Ballymote (IE_WE_G_0037). However, the GCR will consist of minor excavations and therefore there is no potential for impacts to the groundwater hydrological regime. There is no potential for adverse effects.
Substratum composition: particle size range	Millimetres	Maintain appropriate substratum particle size range, quantity and quality, subject to natural processes	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which are hydrologically connected to the SAC. This could lead to a change in substratum composition which would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex I habitat.
Water quality	Various	Maintain/restore appropriate water quality to support the natural structure and functioning of the habitat	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream, which can negatively impact <i>Ranuncullion fluitantis</i> and <i>Callitricho-batrachion</i> vegetation (Ní Bhroin, 2006). Impacts to the vegetation would result in a change of the area and distribution of the habitat which would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex I habitat.
Typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	
Floodplain connectivity: area	Hectares	Maintain/restore the area of active floodplain at and upstream of the habitat	No instream works are proposed along river waterbodies that discharge into this SAC and all works will take place outside the SAC boundary. The Proposed Project will not result in a change in floodplain connectivity. There is no potential for adverse effects.
Riparian habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types	A variety of upland and woodland habitats fringe the streams in the SAC. Fringing habitats contribute to the aquatic food web, provide habitat for life-stages of fish, birds and aquatic invertebrates, assist in the settlement of fine suspended material, protect banks from erosion and contribute to nutrient cycling. (NPWS, 2021d). Fringing habitats are equally dependent on rivers. The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses which are hydrologically connected to the SAC. This could lead to a change in fringing habitat which would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex I habitat.
1106 Salmon (<i>Salmo salar</i>)			
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	No instream works are proposed along river waterbodies that discharge into this SAC. There is no potential for the Proposed Project to inhibit accessibility/migration through river channels, therefore, there is no potential for adverse effects.

¹⁵ Only the QIs with potential to be affected by the Proposed Project are considered as other QIs have been excluded (refer to Section 5.1.1.14) due to distance or because they are not sensitive to the identified impacts and effects and thus not likely to be affected.



Attributes	Measures	Target	Potential for Adverse Effects on Site Integrity
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	The Proposed Project has the potential to result in a degradation of water quality and the release of suspended solids downstream and within the SAC. The degradation of water quality could result in further impacts on the CL of Unshin River SAC. A reduction in water quality could reduce the population of this species. This would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex II species.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Crisp (2000) notes that 'salmon spawning site selection is governed by complex environmental factors, which are all essential for successful spawning, egg survival and hatching, including intra-gravel flow, gravel size, water depth, as well as stream velocity and cover' and that 'one of the most important factors for salmon egg survival is oxygen supply, which is dependent upon dissolved oxygen concentration and inter-gravel flow'. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	The release of suspended solids and/or pollution has the potential to impact spawning sites which would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex II species.
Out-migrating smolt abundance	Number	No significant decline	No instream works are proposed along river waterbodies that discharge into the SAC and no works will take place within the SAC boundary. The Proposed Project will therefore not inhibit smolt out migration. There is no potential for adverse effects on out-migrating smolt abundance.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	The Proposed Project has the potential to result in the degradation of water quality and the release of suspended solids into watercourses located downstream. The degradation of water quality could prevent the watercourses which drain the Proposed Project from maintaining and/or achieving at least a Q4 water quality status. This would constitute an adverse effect on the integrity of Unshin River SAC by undermining the conservation objective for this Annex II species.
1355 Otter (<i>Lutra lutra</i>)			
Distribution	Percentage positive survey sites	Percentage positive	No instream works are proposed along river waterbodies that discharge into the SAC and no works will take place within the SAC boundary. The Proposed Project will therefore not inhibit smolt out migration. There is no potential for adverse effects.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 124.68ha	The Proposed Project will not result in a decline of terrestrial or freshwater habitat within the SAC, as no works (including the clearance of vegetation) will occur outside the Proposed Project. There is no potential for adverse effects.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 66.55km	
Couching sites and holts	Number	No significant decline	The Proposed Project will not result in any loss of habitat or disturbance to otter within the SAC. There is no potential for adverse effects
Fish biomass available	Kilograms	No significant decline	The potential degradation of water quality within watercourses draining the Proposed Project could affect the availability of fish biomass to otter. A significant pollution event from the Proposed Project could result in a decline in available feeding resources for otter which would constitute an adverse effect on the integrity of Unshin River SAC .
Barriers to connectivity	Number	No significant decline	Otter will regularly commute across stretches of open water up to 500m and it is important that such commuting routes are not obstructed (NPWS, 2021d). The Proposed Project does not include works within the SAC and connectivity with the SAC will not be impacted. There is, therefore, no potential for adverse effects on the SAC.



Appendix A-II INVASIVE SPECIES MANAGEMENT PLAN





Lissinagroagh Windfarm Invasive Alien Species Management Plan



November 2025

TOBIN



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Cover photo: Generic image of Invasive Alien Species in Ireland.

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1. INTRODUCTION

This Invasive Alien Species Management Plan (IASMP) has been developed by INVAS Biosecurity (INVAS) in partnership with EcoQuest Environmental (EcoQuest), on behalf of Tobin Consulting Engineers (Tobin) for the proposed Lissinagroagh Windfarm, associated grid connection route (GCR) and turbine delivery route (TDR). Ecologists representing Tobin Consulting Engineers carried out all ecological and Invasive Alien Species (IAS) surveys between September 2020 and August 2025.

1.1. Project Background

The proposed Lissinagroagh Windfarm site is located within both forested Coillte and privately owned lands, approximately 3km north of Manorhamilton in north County Leitrim. The project comprises of a development of a wind farm of up to 14 no. wind turbines and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, an on-site 110kV electrical substation and a grid connection comprising a tail-fed underground connection into the Srananagh 220 kV Substation in Co. Sligo. The project will also comprise facilitating accommodation areas on the public road network and at private properties to accommodate the delivery of turbine components along the TDR which will run to the port of Killybegs in Co. Donegal. The study is shown in Figure 1.1 below. The survey results are shown in Figures 3.1, 3.2 and 3.3.

1.2. Objectives

The primary objectives of this Invasive Species Management Plan (IASMP) are as follows:

- Prepare an IASMP based on the findings of surveys carried out by Tobin and advise on appropriate management approaches for the construction of the Lissinagroagh Windfarm, associated grid connection route (GCR) and turbine delivery route (TDR);
- To document and map the findings from the surveyed areas;
- Recommend best practice techniques in the vicinity of invasive species to avoid their spread within and outside of the site; and,
- Recommend approaches to invasive species removal or retention where feasible if required using standard and accepted methodologies

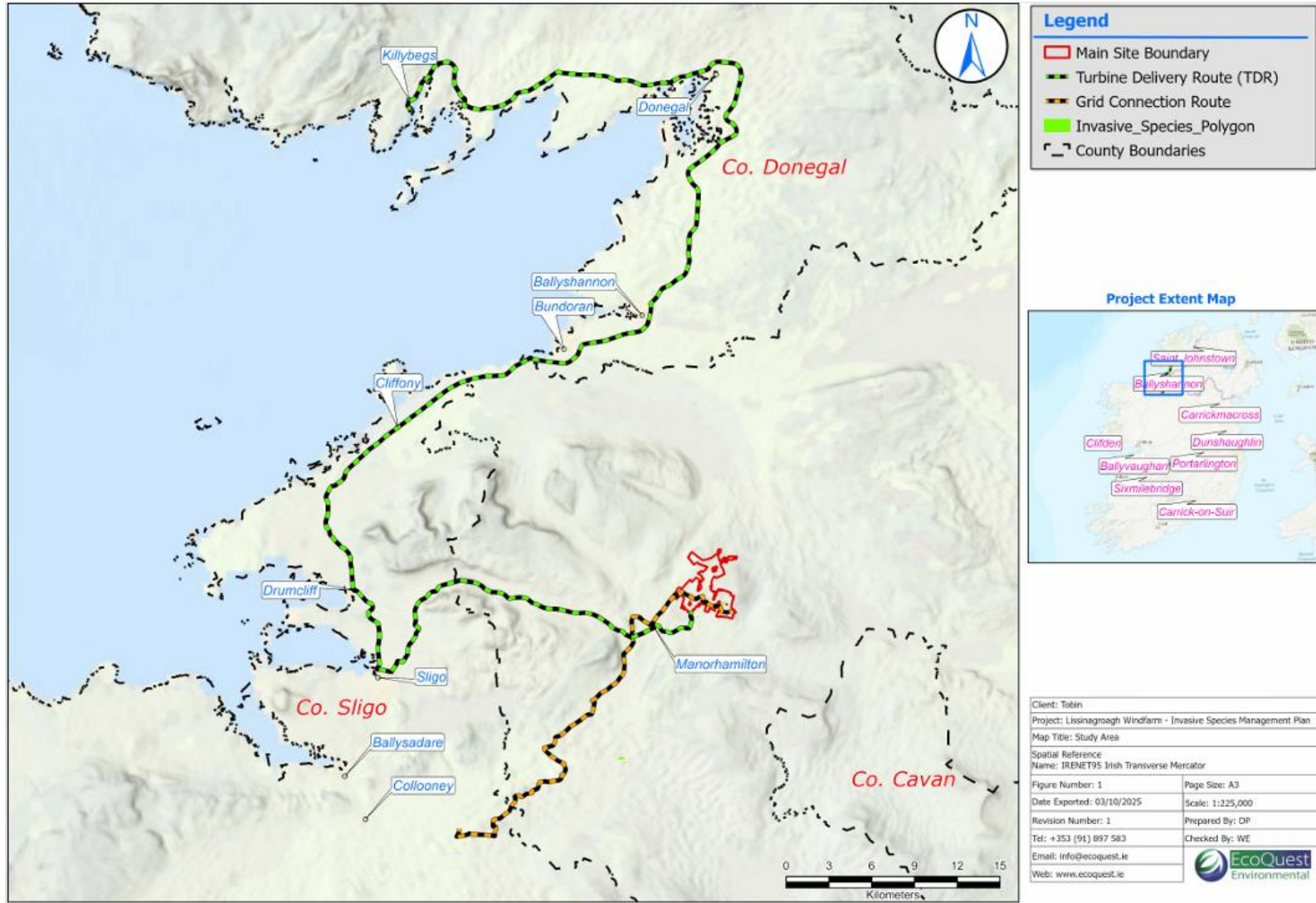


Figure 2.1: The study area associated with the proposed Lissinagroagh Windfarm provided to INVAS in October 2025 by Tobin..

1.3. Experience of Consultants

The report was prepared by Senior Ecologist Dr. William Earle and Principal Environmental Consultant David Parkinson (BSc., MIEMA, CEnv). William is responsible for IAS, macrophyte and ecological field surveys using drone and GPS technology. He is in charge of GIS mapping and map production in INVAS. IAS survey reports and Appropriate Assessment preparation. William has produced AA Screenings and NIS reports for IFI on the management of Natura sites and their conservation objectives throughout Ireland, with some of the most relevant projects including; AA Stage 1 Screening for IAPS Management on the Owenea River 2021, AA Stage 1 Screening for Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations (2020-2024), AA Screening for the Management of *Lagarosiphon major* in Lough Corrib 2020 and AA Stage 1 Screening and NIS for Fisheries Enhancement and Maintenance Projects the Lough Corrib Catchment in 2020, 21 and 22. INVAS have worked with statutory/regulatory bodies, stakeholders and IFI staff responsible for overseeing these projects, both virtually and in person, to produce AAS, NIS and EcIA's in line with National and international guidance, as well as all relevant legislation and existing baseline datasets.

William delivers invasive species identification and management training to Local Authorities staff, Waterways Ireland, Engineers Ireland and other private, state and semi-state bodies. He carries out invasive plant surveys, treatment, GIS mapping and map production for County Councils, independent developers, NPWS, ESB and several other bodies. He is responsible for the development and implementation of site-specific management plans for several invasive aquatic and terrestrial plant species including: Japanese, Giant and Himalayan knotweed – Excavation, disposal and bund construction; *Lagarosiphon* and Nuttall's pondweed – Mechanical removal and benthic jute matting; Giant Hogweed – Coordinated management for Local Authorities; Himalayan balsam – Coordinated management of catchments including Camcor and Castlebar Rivers.

David is the Principal Environmental Consultant of EcoQuest Environmental with 17 years of environmental consultancy experience in Ireland and Australia. David has previously been involved in numerous invasive species surveys, management plans, invasive species awareness presentations, is a Full Member of the Institute of Sustainability & Environmental Professionals (MISEP) and is a Chartered Environmentalist (CEnv).

David's experience spans multiple industry sectors or disciplines, including numerous flood alleviation schemes, windfarm projects, infrastructure projects, transport, aviation, wastewater



schemes, contaminated land and advisory on emerging contaminants. He has extensive environmental management and invasive species management experience on major Irish rivers or their tributaries such as the Shannon, Dodder, Morell, Corrib, Broadmeadow, Finisk, Bandon, Poddle, Whitechurch and Garavogue rivers. In addition to invasive species management across major Irish river networks, David has also assisted with the management of invasive species at sensitive wetlands of international significance in Australia.

2. LEGISLATIVE CONTEXT

2.1. European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024).

The control of invasive alien species in Ireland is regulated through the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024). Those species listed in the First Schedule of these regulations, and which are known to be present on the study area are highlighted in Section 4.

2.1.1. First Schedule: Part 1 - Plants

Table 2.1: Non-Native Plant Species Subject to Restrictions

Common Name	Scientific Name	Geographical Application
American skunk-cabbage	<i>Lysichiton americanus</i>	Throughout the State
A red alga	<i>Grateloupia doryphora</i>	Throughout the State
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Throughout the State
Broad-leaved rush	<i>Juncus planifolius</i>	Throughout the State
Cape pondweed	<i>Aponogeton distachyos</i>	Throughout the State
Cord-grasses	<i>Spartina</i> (all species and hybrids)	Throughout the State
Curly waterweed	<i>Lagarosiphon major</i>	Throughout the State
Dwarf eel-grass	<i>Zostera japonica</i>	Throughout the State
Fanwort	<i>Cabomba caroliniana</i>	Throughout the State
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Throughout the State
Fringed water-lily	<i>Nymphoides peltata</i>	Throughout the State
Giant hogweed	<i>Heracleum mantegazzianum</i>	Throughout the State
Giant knotweed	<i>Fallopia sachalinensis</i>	Throughout the State
Giant-rhubarb	<i>Gunnera tinctoria</i>	Throughout the State
Giant salvinia	<i>Salvinia molesta</i>	Throughout the State
Himalayan balsam	<i>Impatiens glandulifera</i>	Throughout the State
Himalayan knotweed	<i>Persicaria wallichii</i>	Throughout the State
Hottentot-fig	<i>Carpobrotus edulis</i>	Throughout the State
Japanese knotweed	<i>Fallopia japonica</i>	Throughout the State
Large-flowered waterweed	<i>Egeria densa</i>	Throughout the State
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Throughout the State
New Zealand pigmyweed	<i>Crassula helmsii</i>	Throughout the State
Parrot's feather	<i>Myriophyllum aquaticum</i>	Throughout the State

Common Name	Scientific Name	Geographical Application
Rhododendron	<i>Rhododendron ponticum</i>	Throughout the State
Salmonberry	<i>Rubus spectabilis</i>	Throughout the State
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Throughout the State
Spanish bluebell	<i>Hyacinthoides hispanica</i>	Throughout the State
Three-cornered leek	<i>Allium triquetrum</i>	Throughout the State
Wakame	<i>Undaria pinnatifida</i>	Throughout the State
Water chestnut	<i>Trapa natans</i>	Throughout the State
Water fern	<i>Azolla filiculoides</i>	Throughout the State
Water lettuce	<i>Pistia stratiotes</i>	Throughout the State
Water-primrose	<i>Ludwigia</i> (all species)	Throughout the State
Waterweeds	<i>Elodea</i> (all species)	Throughout the State
Wireweed	<i>Sargassum muticum</i>	Throughout the State

Table 2.1: Second Schedule: Vector Materials

Vector Material	Species Referred To	Geographical Application
Blue mussel (<i>Mytilus edulis</i>) seed for aquaculture taken from places (including places outside the State) where there are established populations of the slipper limpet (<i>Crepidula fornicata</i>) or from places within 50 km. of such places	Mussel (<i>Mytilus edulis</i>) Slipper limpet (<i>Crepidula fornicata</i>)	Throughout the State
Soil or spoil taken from places infested with Japanese knotweed (<i>Reynoutria japonica</i>), giant knotweed (<i>Reynoutria sachalinensis</i>) or their hybrid Bohemian knotweed (<i>Reynoutria x bohemica</i>)	Japanese knotweed (<i>Fallopia japonica</i>) Giant knotweed (<i>Fallopia sachalinensis</i>) Bohemian knotweed (<i>Reynoutria x bohemica</i>)	Throughout the State

2.2. EU Regulation 1143/2014 on Invasive Alien Species

On 14 July 2016, the European Commission published Commission Implementing Regulation 2016/1141 which set out an initial list of 37 species to which the EU Invasive Alien Species Regulation 1143/2014 applies. The associated restrictions and obligations came into force on 3rd August 2016. This list has undergone several updates and now contains 115 IAS. From the Tobin IAS surveys, Japanese knotweed and Himalayan balsam are currently both contained on the EU list. Three distinct types of measures are envisaged under the Directive, which follow an internationally agreed hierarchical approach to combatting IAS:

- Prevention: a number of robust measures aimed at preventing IAS of Union concern from entering the EU, either intentionally or unintentionally;
- Early detection and rapid eradication: Member States must put in place a surveillance system to detect the presence of IAS of Union concern as early as possible and take rapid eradication measures to prevent them from establishing;
- Management: some IAS of Union concern are already well-established in certain Member States and concerted management action is needed so that they do not spread any further and to minimise the harm they cause.

2.3. Other Non-native Species Which Threaten Biodiversity

Several other non-native invasive species have been recorded within the environs of the project area. These include:

- Box hedge (*Buxus sempervirens*)
- Butterfly bush (*Buddleia davidii*);
- Cherry laurel (*Prunus laurocerasus*);
- Fuchsia (*Fuchsia magellanica*)
- Himalayan honeysuckle/ Pheasant berry (*Leycesteria formosa*)
- Lesser Knotweed (*Persicaria campanulata*)
- Montbretia (*Crocasmia x crocosmiiflora*);
- Prince of Wales (*Juniperus horizontalis*)
- Laurel (*Aucuba japonica*);
- Snowberry (*Symphoricarpos albus*).

Many of these non-native species are listed in the Transport Infrastructure Ireland (TII) document “*The Management of Invasive Alien Plant Species on National Roads – Technical Guidance GE-ENV-01105 December 2020*” and in the previous document NRA Guidelines on “*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*”.



Information on the control and eradication of some of these species is presented on the Invasive Species Ireland website (<https://invasives.ie/>), and although there are no legal requirements to eradicate or control these species, it is important that the project does not further their spread and the development and implementation of a plan to remove/control them during the works is in line with best practice. It is recommended that the non-native species listed above, which are non-First Schedule listed species, are also removed as part of the works when feasible to do so as they are also invasive and cause issues for biodiversity.

3. METHODOLOGY

3.1. Survey Data Review

Survey location data in the form of maps, photographs, GIS files and tables have been provided by the client. The survey results have been grouped into both First Schedule listed species under the *European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024)*, and non-First Schedule listed species.

The locations of each identified species relative to the proposed project design elements have also been reviewed. Recommendations for the removal and/or treatment of various plant species have been derived based on their legal designation and on their locations relative to various design elements such as turbine locations, hardstand areas, substation, met mast, access roads, cable routes and road widening areas etc.

3.2. GIS Mapping

Following receipt of the field survey data, maps were produced illustrating the results of the field survey using the ArcGIS Pro 3.5.3 software. The GPS locations of the invasive species that were recorded during the surveys were plotted onto base maps. The study area has been mapped on Figure 1, the results of the field surveys are visually represented on Figures 2, 3 and 4

3.3. Guidelines and Standards

The recommendations contained in this report have been developed with cognisance to the following best practice guidelines:

- Best Practice Management Guidelines for Japanese knotweed (Invasive Species Ireland, 2008);
- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010), Revision 1, December 2010;
- Managing Japanese knotweed on development sites - the knotweed code of practice (Environment Agency, September 2013);
- Invasive Species Ireland guidance (<http://invasivespeciesireland.com>);
- Department of Housing, Local Government and Heritage, Ireland's Draft 4th National Biodiversity Action Plan (2022)

- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. GE-ENV-01105. (Transport Infrastructure Ireland, 2020). December 2020; and,
- The Management of Invasive Alien Plant Species on National Roads – Standard GE-ENV-01104. (Transport Infrastructure Ireland, 2020). December 2020.
- Connemara Green, Inspiring Action for Conservation, Rhododendron Control Training Video <https://connemaragreen.ie/watch-this-video-on-rhododendron-control-in-killarney-national-park/>

3.4. Constraints

Representatives from INVAS and EcoQuest were not present during any of the field surveys, the content in this report is dependent on the data which has been provided by the client. It has been assumed that all data provided is correct in terms of both species' identification and location. Scientific names have not been provided for the species which were recorded during the field surveys, and this has resulted in species level identification assumptions being made in this report. It is noted that in some cases, it is possible that the species level identification may be different to the original Tobin surveys. While it is possible that there are no records of IAS in the northern portion of the study area, there does not appear to be any data included for this region.

4. SURVEY RESULTS

4.1. Invasive Species listed under European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and EU Invasive Alien Species Regulation 1143/2014

Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and Rhododendron (*Rhododendron ponticum*) are all listed under the *European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024)* and were recorded during the field surveys. Japanese knotweed and Himalayan balsam are also contained in EU Regulation 1143/2014. This section provides background information on each Regulated IAS and provides a table outlining their recorded distributions in relation to the proposed project.

4.1.1. Japanese Knotweed

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are also covered under the Regulations. A high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.1: Species description and legislation relating to Japanese knotweed.

<p>Distinguishing features</p>	<p>Japanese knotweed (<i>Reynoutria japonica</i>) (and the closely related Bohemian knotweed (<i>Reynoutria x bohemica</i>)) is a robust, vigorous herbaceous perennial that grows in dense and often continuous stands. It has branched, hollow, red or purple mottled bamboo-like shoots that grow to 3m tall (Bohemian knotweed grows to 4m and Giant knotweed grows to 5m tall). In winter, stems remain on site as the tall, dry, red or straw-coloured hollow canes. All the leaves of Japanese knotweed plants are flattened (truncate) at the base. (The leaves of Bohemian knotweed are larger and more variable than those of Japanese knotweed, supporting both heart-shaped (indented/cordate at the base) and flattened (truncate at the base) forms, the former being more prominent lower down the stem.) Leaves are arranged in a zig-zag pattern on an arching stem.</p> <p>Flowers are small, creamy-white and hang in clusters from leaf axils; the clusters are longer than leaves in Japanese knotweed, while they are roughly the same length as the subtending leaf for Bohemian knotweed.</p> <p>Japanese knotweed has deeply penetrating, woody rhizomes – to 2m deep and 7m laterally from the last visible plant.</p>
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Habitat	Knotweeds are species of waste ground, roadsides, rail corridors and riparian habitats - alongside lakes, rivers, canals, ponds and ditches in rich to poor soil types.
Ecology	<p>Knotweeds are non-native (and invasive) species (native to East Asia in Japan, China and Korea) and widespread in Ireland.</p> <p>Bohemian knotweed is a hybrid between the smaller Japanese and the larger Giant knotweed species.</p>
Impact	<p>Knotweeds can impact on biodiversity by outcompeting native plants. Riparian habitats invaded by knotweeds have lower invertebrate abundance, species richness and biomass, and lower plant species richness compared to uninvaded sites, which is likely to impact on local fauna that use riparian habitats.</p> <p>Following dieback in winter, the ground surrounding infestations is left vulnerable to soil erosion and bankside subsidence due to the absence of a root weft that is normally produced by native grasses and herbs to bind the soils against winter floods.</p> <p>The presence of knotweed leaf litter in streams has also been shown to have adverse effects on the species composition of affected streams. #</p> <p>The robust and extensive woody rhizomes of knotweed species are capable of penetrating asphalt, cracked foundations, walls, land drainage works and other built structures, causing significant structural damage.</p>
Dispersal	The rhizomes are highly regenerative and even small rhizome fragments can produce new plants. Rhizome material can remain dormant in the soil for up to 20 years. Cut or discarded stems with nodes can also root and produce new plant stands. As only female plants have been recorded in Ireland, no viable seeds are produced.
Legislation	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011(S.I. No. 477/2011), EU (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and listed as an ‘IAS of Union concern’ under EU IAS Regulation (1143/2014) . Soil taken from a place that is infested with knotweed (vector material) is also restricted under Part 3 of the Third Schedule in S.I.477. The law relating to knotweed is primarily contained in Regulation 49 (2), which states that it is an offence to ‘allow or cause to disperse’ plants listed in the Third Schedule, of which Japanese and Bohemian knotweed are included. As such, any knotweed plant material or contaminated soil that is to be removed from an infested site can only be done so under a licence issued by the National Parks and Wildlife Service (NPWS).

Table 4.2: General locations for Japanese knotweed records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	Record location
Main site	<i>circa.</i> 70m south of the T8 hardstand area
Main site	<i>circa.</i> 20m southeast of the largest borrow pit
Main site	<i>circa.</i> 250m northwest of the smaller borrow pit, along the access road to T13/T14.
South of the main site planning boundary Grid Connection Route	Multiple stands have been recorded beyond the southern site boundary in the townlands of Boleyboy, Cashelaveela and Cherrybrook Along the L-2169 road in the townland of Cornastauk
Grid Connection Route	Along the L-2169 road in the townland of Srabrick
Grid Connection Route	Along the L-2169 road in the townland of Cloonaquin (two separate locations)
Grid Connection Route	Along the L-4166 road in the townland of Carrigeencor
Grid Connection Route	Along the R-289 road in the townland of Cleen
Turbine Delivery Route	Along the N56 national road in the townland of Ballymogowan, Co. Donegal
Turbine Delivery Route	Along the N56 national road in the townland of Bruckless, Co. Donegal

4.1.2. Himalayan Balsam

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are not covered under the Regulations, however, a high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.4: Species description and legislation for Himalayan balsam.

Distinguishing features	Himalayan balsam (<i>Impatiens glandulifera</i>) is one of the largest annual herbs in Ireland, growing to 3m tall. The stems are erect, hollow, succulent, thick ribbed, reddish and hexagonal in cross section. The leaves are up to 20cm long, stalked, have a rounded base with serrated margins, pointed tips, and hairless. They are pale green with a red midrib. The flowers are pink to whitish, borne at the apex of the plant. They are characteristically trumpet-shaped and mildly scented. The seed capsules are 2.5cm long, green to red, ridged and explode when ripe. The roots are very short, bulbous and red.
Habitat	This species prefers moist, nutrient-rich habitats, although it has a wide habitat tolerance, particularly along rivers, canals, ditches, margins of wet woodland and roadsides.
Ecology	Non-native (native to west and central Himalayas) and widespread in Ireland. It lives for just one season, seeds and dies. The majority of the seeds germinate in their first year, although a small percentage can survive for two years.
Impact	Dense monodominant stands can dominate entire riparian zones, significantly decreasing native plant species richness. These dense infestations can cause soil erosion and bankside subsidence on river banks, as well as affecting instream biotic communities by the addition of nutrient-rich sediment. The flowers of Himalayan balsam are very rich in nectar and attract pollinator insects away from adjacent native flowering plants.
Dispersal	This species is dispersed solely by seeds from ‘explosive’ seed heads. If the stem of a plant that is pulled from the ground and not broken or crushed, it may root from any node that comes into contact with the ground, producing a new plant.
Legislation	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011(SI 477) and listed as an ‘IAS of Union concern’ under EU IAS Regulation (1143/2014) .

Table 4.5: General locations for Himalayan balsam records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	Record location
Grid Connection Route	Along the L-4165 road in the townland of Cleen
<i>circa.</i> 1.5km East of the Grid Connection Route	Along the riverbank of the Bonet River, in the townlands of Conahgil and Corcuscoony

4.1.3. *Rhododendron*

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are not covered under the Regulations, however, a high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.5: Species description and legislation relating to *Rhododendron*.

Distinguishing features	<p><i>Rhododendron</i> (<i>Rhododendron ponticum</i>) is a fast-growing evergreen shrub that can grow to 8m tall and is tolerant of a wide range of conditions and soil types. It is capable of producing dense thickets.</p> <p>Its leaves are hairless, dark green and glossy above, with a paler underside. Leaves are borne in a spiral at the end of each stem.</p> <p>Flowering normally occurs from late April to June, with plants capable of producing large quantities of seed. Each flower is violet to purple and borne in groups of 10 to 15.</p>
Habitat	<p><i>Rhododendron</i> favours acid soils, in areas of wetland, rocky banks and hillsides, gardens and riparian zones. It is also well adapted to the understory of forestry and woodlands.</p>
Ecology	<p>It is a non-native species (originally from the Iberian Peninsula and wider Mediterranean) that has become widespread in mountainous areas of Ireland, especially in the west. It was introduced into Great Britain in 1763 for ornamental purposes. <i>Rhododendron</i> thrives on peaty, sandy and acidic soils and is extremely hardy.</p> <p>This invasive plant is highly prolific in terms of seed production. These are normally spread up to 100m from the parent plant by wind action or along watercourses.</p> <p>It has become highly invasive in Ireland, with a wide distribution along the west coast due to its prolific seeding, rapid growth rate and its toxicity, which gives it a competitive advantage over native species. This aids in the creation of dense impenetrable thickets that can cover large areas, such as the infestations in Killarney National Park. These mature thickets reduce access and make it difficult to implement control measures.</p>
Impact	<p>Because of the dense vegetation the species produces, it can outcompete native species and become dominant. <i>Rhododendron</i> has a significant adverse impact on native floral (and associated faunal) biodiversity. The leaves contain toxins (free phenols) that result in herbivore avoidance and suppresses regeneration of native understorey species. It is host to <i>Phytophthora ramorum</i>, which causes Sudden oak death.</p>

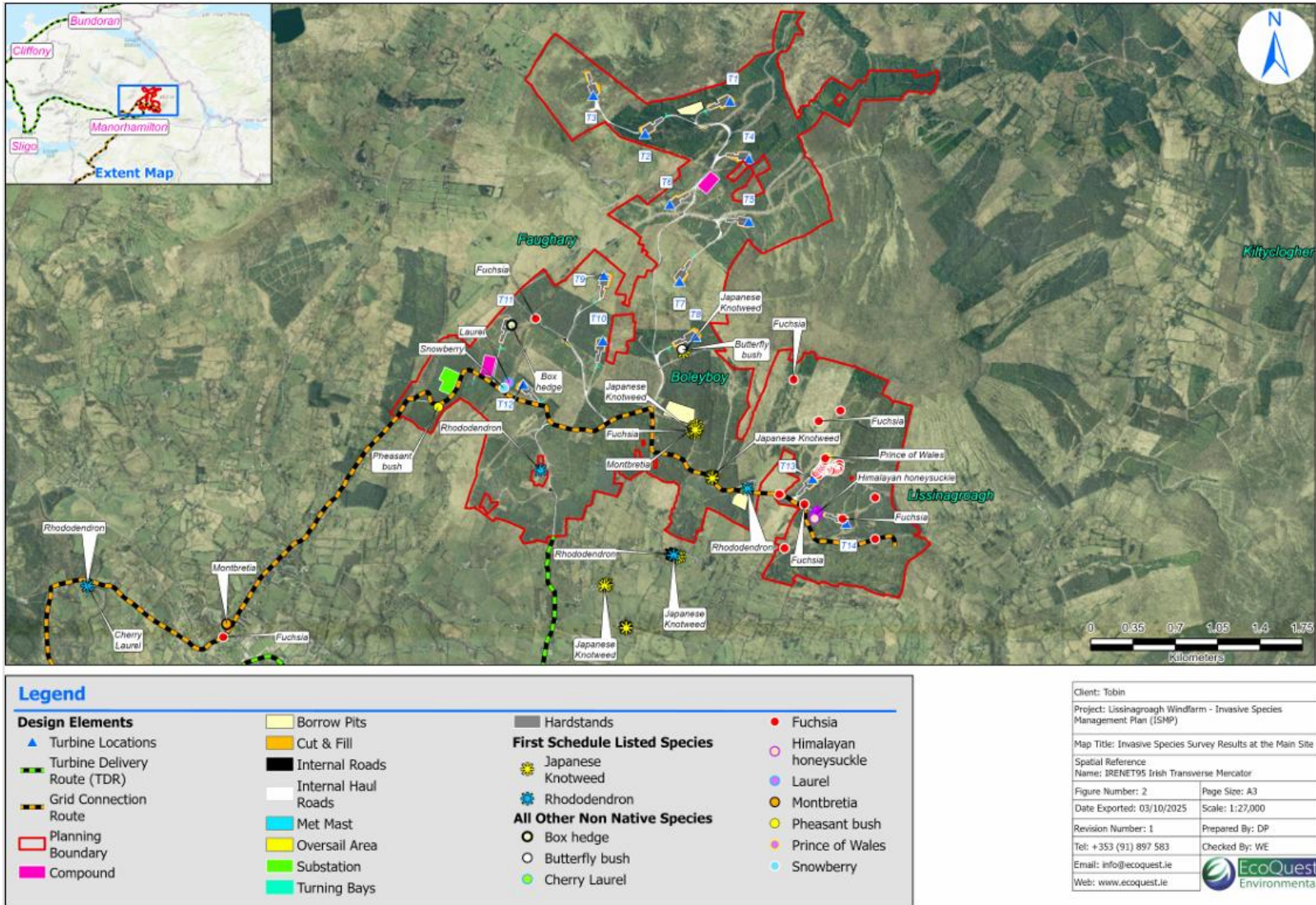
Dispersal	<i>Via</i> rhizome fragments, suckers and seeds. Each flower produces between 3,000 to 7,000 fine powder-like seeds that can persist for up to three years.
Legislation	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011 (SI 477) (as amended).

Table 4.4: General locations for *Rhododendron* records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	Record location
Main site	<i>circa.</i> 560m south of the T12 hardstand area
Main site	<i>circa.</i> 30m north of the small borrow pit, c. 410m west of T13 hardstand area
South of the main site planning boundary	Multiple stands have been recorded beyond the southern site boundary in the townland of Boleyboy
Grid Connection Route	Along the riverbank of the Bonet River, c. 45m south of the L-2136 road in the townland of Milltown
Grid Connection Route	Along the L-21361 road in the townland of Cornastauk
Grid Connection Route	Along the L-4166 road in the townland of Kilcoosy
<i>circa.</i> 1.1km to 1.5km East of the Grid Connection Route	Along a trail in the townland of Conahgil

4.1.4. Non-First Schedule Listed Species

Multiple other plant species which are not subject to restrictions under the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and EU Regulation (1143/2014) were also recorded during the field surveys. These species were recorded at multiple locations at the main site, along the turbine delivery route and along the grid connection route. All locations of all species recorded during the field surveys are mapped on the maps provided (Figures 4.1 - 4.3).



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Figure 4.1: Invasive Species Survey Results at the Main Site provided to INVAS by Tobin in October 2025.

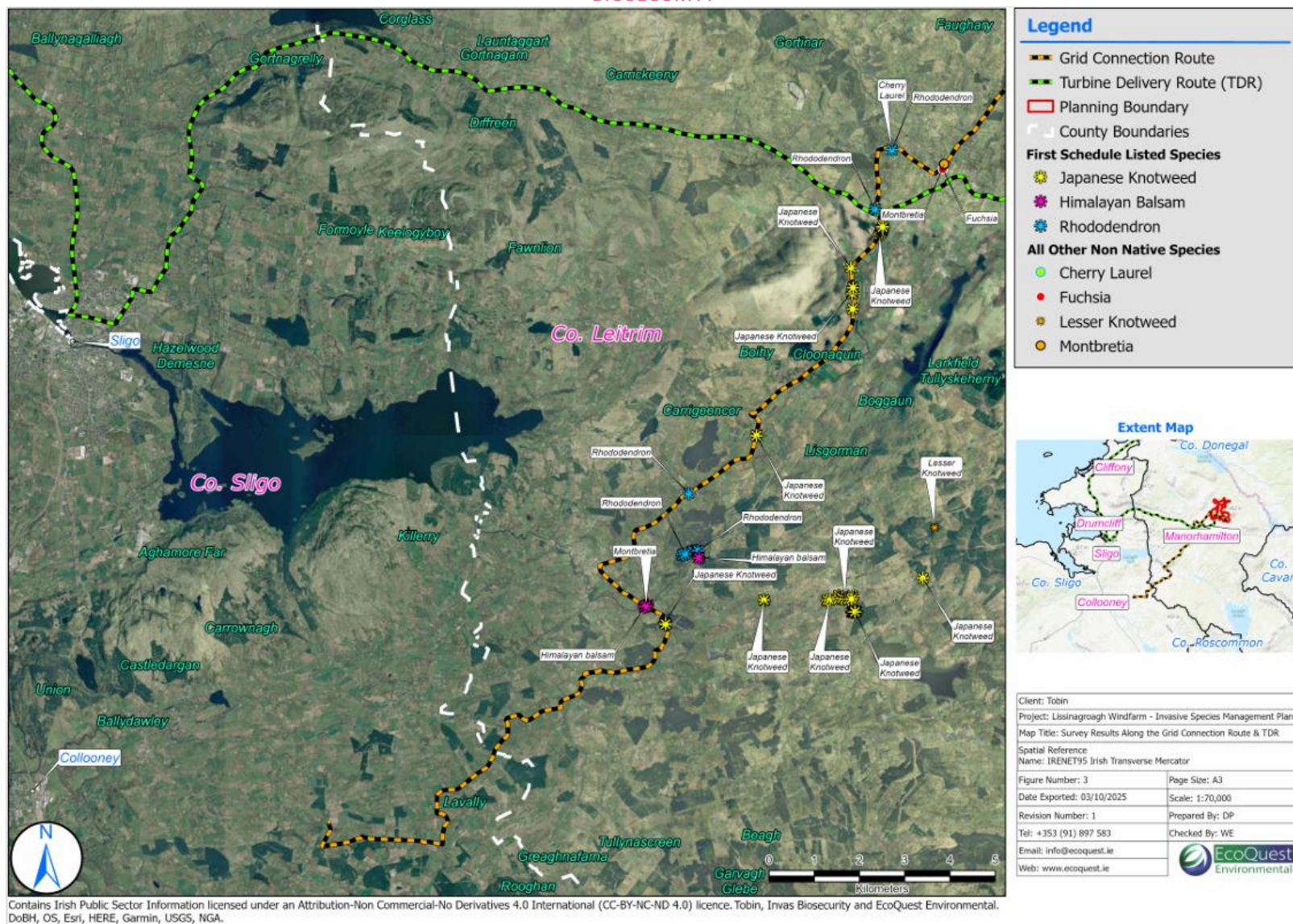
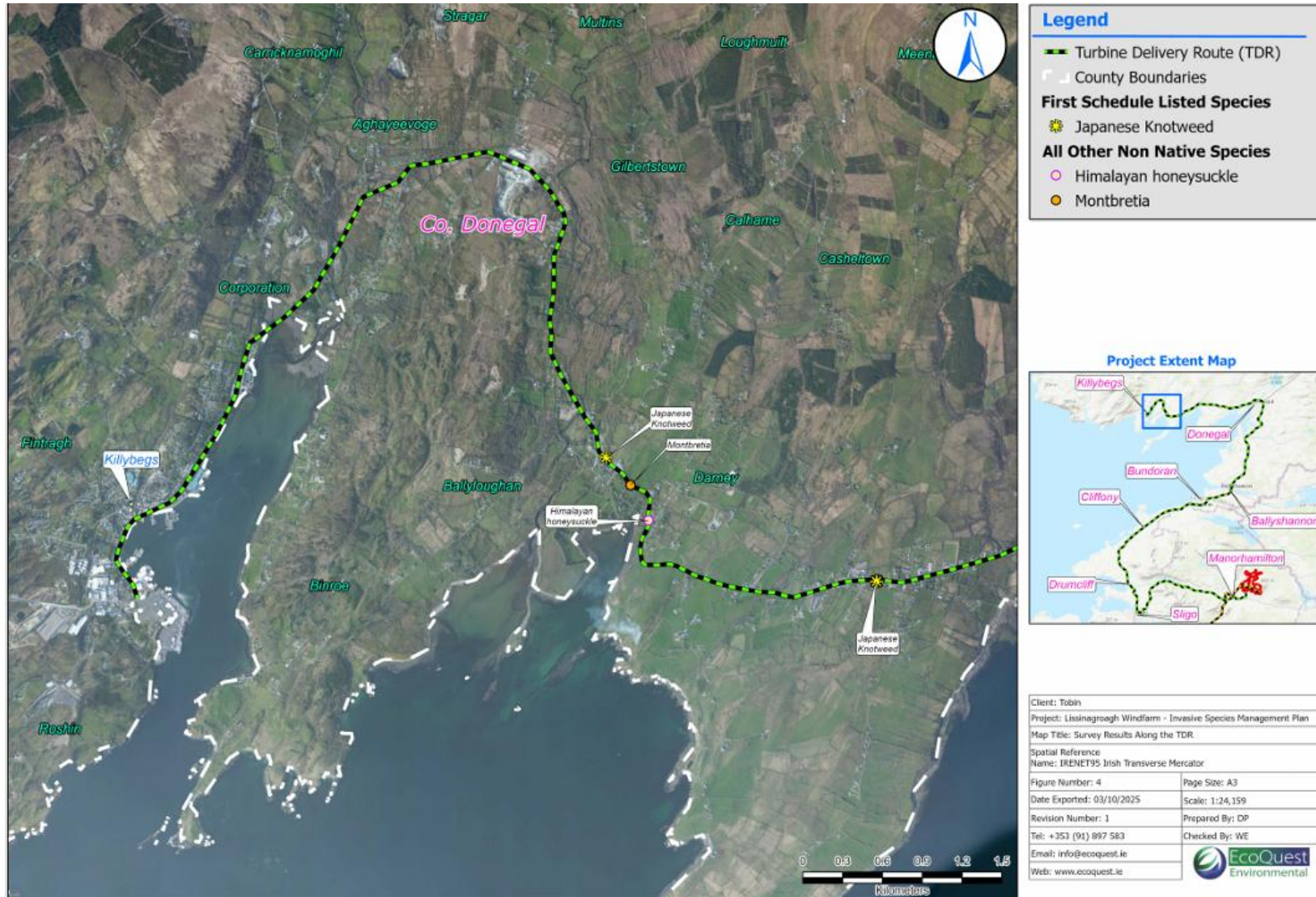


Figure 4.2: Invasive Species Survey Results Along the Grid Connection Route and TDR provided to INVAS by Tobin in October 2025.



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Figure 4.3: Invasive Species Survey Results Along the TDR provided to INVAS by Tobin in October 2025.

5. MANAGEMENT RECOMMENDATIONS

Within the development area boundary, construction activities will be required for the installation of the underground cables and construction of other associated infrastructure. These activities will require soil clearance, excavation and management which has the potential to result in the spread of IAS. Himalayan balsam, Japanese knotweed and Rhododendron are all regulated under the First Schedule of S.I. 374/2024, while Knotweed is also included in the Second Schedule of the same regulation restricting the movement of vector materials containing these species. On this basis, control and management of these IAS is required by the project and suitable options are presented in the sections below. These management options will prevent any accidental spread of the IAS infestations.

A comprehensive long-term Management Plan area should consider prioritising certain species and areas in the region for targeted IAS control and treatment. This IAS control campaign should commence immediately to ensure optimum periods for management prior to the initiation of ground works associated with this project, with an initial focus on those Regulated species detected. Because of what appears to be a relatively limited distribution of some other unregulated IAS in the survey area, it would be prudent to also prioritise control efforts against these as this could result in their significant control within or even eradication from the project area, at minimal cost.

5.1. Prevention / Early Detection Rapid Response (EDRR) / Biosecurity

It is of fundamental importance that construction activities are not a vector for the spread of alien invasive plants and animals. This IASMP should be strictly adhered to by all personnel involved in the works. In advance of construction work commencing within the area, Site-Specific Management Plans shall be prepared for each IAS infestation where any ground works or access is required in these areas and their associated buffer zones. Further biosecurity guidance is outlined in Section 6 of this document. These Plans shall provide guidance on biosecurity, traffic management, excavation and disposal methods to be employed in each case. The Plans shall be designed, implemented and supervised by suitably qualified personnel in advance of any site access.

Prevention, EDRR and Biosecurity will provide a low-cost solution with low ecological impact for all IAS throughout the project area. This will involve sustained monitoring, biosecurity facilities (boot brushes) and site-specific biosecurity plans during any planned works in areas in close proximity to any infestations. This will also involve the implementation of a project

wide Management Plan to prevent any accidental or unintentional spread or dispersal of IAS. In the case of listed First Schedule plant species, should these species be observed in a proposed work zone, the area is to be fenced off and appropriately signed to prohibit unauthorised access. A site-specific Management Plan should be prepared with advice being sought from the Project Ecologist or a third party regarding the best management practice options for the site.

5.2. Japanese knotweed Management Options Prior to the Commencement of the Construction Phase

5.2.1. Foliar herbicide application

It is recommended that foliar herbicide application using a Glyphosate based product that is approved for use in and near water for the management of Japanese knotweed as part of the Lissinagroagh Windfarm. Foliar herbicide management should follow the manufacturers guidelines and be carried out by suitably trained staff, in possession of the relevant qualifications and wearing suitable PPE. Spraying will be carried out at a rate of 5liters/ha using knapsacks fitted with low pressure drift beta nozzles. An inert dye (super signal blue) will be mixed with the solution to ensure all plants at the site are treated. Extra care should be taken where infestations are located among or in close proximity to non-target plant species or any watercourse. Due to the extent of underground rhizome growth and its highly invasive capacity, control of Knotweed following herbicide treatment in a single season is rarely possible. It generally takes three to four seasons of herbicidal treatment to deplete the rhizome reserves and to effectively control the target vegetation. Records of herbicide use must be maintained in accordance with relevant legislation. It is anticipated that natural vegetation regeneration will take place following the herbicide management practices and no enrichment or planting will be required.

Following herbicide management, all treatment site and any other possible areas of infestation should be resurveyed for Knotweed growth for the next three to four years (through to the proposed commencement of construction activities). This will be carried out in June/July each year with any required follow up herbicide treatment taking place between August and October of the same year. Herbicide treatment will follow the same process as outlined above. Strict biosecurity protocols must be adhered to in all follow up surveys and treatments. Based on INVAS's considerable experience dealing with the control of all Knotweed species countrywide, its preferred management option for Knotweed within this development project,

prior to the commencement of construction activities is a sustained treatment with an approved herbicide and monitoring post treatment.

Table 5.1: Proposed management schedule for the recommended management approach for Japanese knotweed recorded as part of the proposed Lissinagroagh Windfarm project.

Year	Timing	Description of works	Treatment
2026	June/July	Survey	None
2025	August/October	Survey and treatment	Foliar herbicide application
2026	June/July	Survey	None
2026	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2027	June/July	Survey	None
2027	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2028	June/July	Survey	None
2028	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2029+	June/July	Survey and retreatment as necessary	Foliar herbicide application in August/October

5.3. Japanese knotweed Management Options Prior to the Commencement of the Construction Phase

Herbicide management will provide an adequate level of control to prevent the ‘spread and dispersal’ of Knotweed on site provided no other interference takes place. If infested areas or their buffer zones must be accessed by personnel or machinery additional measures will be required to prevent any unintentional movement of Knotweed vector material. Below is a description of the subsequent control options for the Knotweed infestations recorded on site where development will take place or additional access or interference with Knotweed infestations is required.

For the client’s preferred control option, a full site-specific Management Plan outlining the specific actions for each stage of the operation will be provided, in advance of the works.

5.3.1. Excavation and disposal off-site option

This would require site operations to excavate all Knotweed plants and associated contaminated soil. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the contaminated material to the appropriately licenced landfill. Strict biosecurity protocols would be adhered to at all times during this process.

It is deemed prudent to remove soil in the infested areas to a depth of at least 1.8 metres and 7 metres from the last visible plant in order to be certain that no rhizomes remain in the soil

following excavation operations. Where the site boundaries restrict the removal of a 7 metre buffer zone, vertical root barrier membrane must be put in place to remove the risk of regrowth from contaminated soil remaining on site.

In the case of buildings and boundaries close to Knotweed infestations, excavation depths and distances would be authorised by a suitably qualified engineer. The material would be disposed of at a licenced landfill subject to acquiring a licence for soil movement from the NPWS.

Detailed records of all operations will be maintained throughout the project. These records will specifically focus on the exact areas excavated, the method of excavation, the depth of excavation, the volume of material (as numbers of truck loads) removed, an inventory of personnel and equipment entering and leaving the Knotweed demarcated areas, and the operation of cleaning and disinfection facilities provided at each area.

5.3.2. Excavation and disposal on-site option

Deep burial in an on-site containment cell can be used in certain scenarios. Excavation must remove all Knotweed rhizome material and would be carried out in the same manner as for the 'Excavation and disposal off-site' method.

The site selection would take into account services, landscaping, transport routes, possibility of erosion and the future use of the site. The distance for contaminated material to be transported throughout the site would be minimised with the deep burial site located as close as possible to the site of infestation. If the burial site is located in a different area to the infestation, biosecurity measures would be put in place including decontamination facilities and designated work and haulage areas.

Prior to excavation, the invasive plant material would be treated with a non-persistent herbicide and left in situ for the herbicide's prescribed "active" period. The disposal site would require the construction of a containment cell made from root barrier membrane. Once filled with Knotweed contaminated material the cell shall be sealed and then buried beneath 5 metres of inert backfill or uncontaminated soil. This method would map the location of the containment cell but would not require an ongoing management plan.

5.3.3. Excavation and bunding option

Disposal of Knotweed contaminated waste using deep burial in a licenced landfill can be expensive. A preferential method may be to use a Knotweed bund where suitable land is available. A bund is an area of ground that is cordoned off and where the contaminated soil is

placed on top of a root barrier membrane, to a depth not exceeding 1 metre. The bund would be constructed using a proprietary root barrier membrane, which is a reinforced, impermeable, polyethylene membrane and should have a life expectancy of at least 50 years. The aim of this disposal method is to isolate contaminated soil and encourage Knotweed regrowth, which can then be treated with approved herbicides. A tracked excavator would be used to remove the soil and plant material from the infested areas to a depth of at least 1.8 metres below ground level. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the material to the appropriate location on the bund site. Strict biosecurity protocols shall be adhered to at all times during this process and a long-term herbicide management plan would be put in place. A protective fence would be placed around the bund and fitted with appropriate warning or information signage. This fence may be put in place before or after the bund construction operation. Access to the completed bund would be restricted to authorised persons. Any Knotweed plant material or contaminated soil that is to be removed from an infested site can only be done so under a licence issued by the National Parks and Wildlife Service (NPWS).

5.3.4. Excavation and soil screening option

Screening is a process that is offered by some companies in the United Kingdom (UK). This method involves excavating all of the contaminated soil before passing it through a screening machine that extracts the heavy rhizomes. The second phase of this process would pass the soil along a belt where the remaining fragments are extracted by hand. This method can greatly improve the site and is far less intrusive as there is no transfer of soil from the infested site. However, this method does not carry a guarantee of eradication and can be a time consuming, expensive process.

An eradication guarantee cannot be provided with this method as all minor rhizome fragments may not be removed from the soil. This may result in the regrowth of rhizomes throughout the site which would necessitate further treatment. An ongoing management plan (herbicide/further screening) would also be required for this option.

5.3.5. Currently recommended Knotweed management option for the construction phase

Knotweed throughout the development area should continue to be managed by foliar herbicide application to prevent any immediate 'spread or dispersal' of these species, as outlined above. While ongoing herbicide control will deplete the underground rhizome reserves and reduce the risk of accidental spread, additional management options will be required in advance of any

construction works. As the project progresses and the development of infrastructure is required, the recommended management option for soils infested with Knotweed, is excavation for disposal off-site. Key areas where cable installation or infrastructure development will require all areas with Knotweed infested soils to be managed using this method. Although ‘excavation for disposal off-site’ is broadly the most suitable option, this will be reviewed in advance of any construction activities and final site-specific requirements for each area will be confirmed, depending on the extents of infestations and proposed development in each area. This management option for Knotweed will also be aligned with any final landscape reinstatement plans for the development area. The final management option for Knotweed will be reviewed and agreed upon with input from the relevant stakeholders including Local Authorities, Landowners, Coillte, the National Parks and Wildlife Service (NPWS) and any other stakeholders.

5.4. Himalayan Balsam Management Options

5.4.1. Balsam Bashing or Manual Removal of Himalayan Balsam Plants

While Himalayan balsam is susceptible to control by herbicide, its biology and natural weaknesses lend themselves well to a method of manual control known as ‘balsam bashing’. Successful control and eradication can be achieved where a coordinated 3-year balsam removal programme is followed, with follow up monitoring. This involves the initial manual removal of the plant from the ground when it is about 1m tall and before any flowers or seeds have been produced, normally in May or early June. The fact that the roots are so shallow means that they can be easily removed from the soil by gently pulling on the stem. Once the plant is removed, the plant is broken to ensure that it will not flower and set seed. The broken plants can be left *in situ* to decay naturally or can be gathered and brought to a composting facility. It is essential that a second balsam removal operation is conducted at the treatment location in July and August of the same year. This reflects the fact that balsam seeds in the soil from the previous year, i.e., seeds that had not yet germinated, will be stimulated to germinate and grow by the removal of the earlier generation of shade-giving balsam plants. If not removed, these plants will flower and set seed in autumn, thus further adding to the soil seed reserve.

As Himalayan balsam seeds can live for more than one season, it is important to repeat the manual control operations again in the following year. This will ensure that no new seeds are added to the soil seed bank and will further deplete the seed reserve that was laid down prior to the commencement of control operations at the treatment location. Experience with similar operations in Ireland has shown that dense stands of Himalayan balsam are commonly recorded in the second year of control. However, once no plants have set seed since operations commenced (and no seeds are introduced from upstream or adjacent to the treatment area), very few balsam plants should emerge in the third year of treatment, although monitoring and selective plant removal will be required.

Table 5.2: Proposed management schedule for the recommended management approach for Himalayan balsam recorded as part of the proposed Lissinagroagh Windfarm project.

Year	Timing	Description of works	Treatment
2026	May/June	Survey and management	Manual management
2026	July	Survey and management	Manual management
2026	August/September	Survey and management	Manual management
2026	June/July	Survey and management	Manual management
2026	August/October	Survey and management	Manual management
2027	June/July	Survey and management	Manual management
2027	August/October	Survey and management	Manual management
2028	June/July	Survey and management	Manual management
2028	August/October	Survey and management	Manual management
2029+	June/July	Survey and retreatment as necessary	Manual management

5.4.2. Himalayan Balsam Management Options Prior to the Commencement of the Construction Phase

Manual management will provide an adequate level of control to prevent the ‘spread and dispersal’ of Himalayan balsam on site provided no other interference takes place. If infested areas or their buffer zones must be accessed by personnel or machinery additional measures will be required to prevent any unintentional movement of Himalayan balsam material. Below is a description of the subsequent control options for the Himalayan balsam infestations recorded on site where development will take place or additional access or interference with infestations is required. For the client’s preferred control option, a full site-specific Management Plan outlining the specific actions for each stage of the operation will be provided, in advance of the works.

5.4.3. Excavation and disposal off-site option

This would require site operations to excavate all Himalayan balsam infested soil. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the contaminated material to the appropriately licenced landfill. Strict biosecurity protocols would be adhered to at all times during this process.

It is deemed prudent to remove soil in the infested areas to a depth of at least 300mm from the last visible plant in order to be certain that no seeds remain in the soil following excavation operations. The material would be disposed of at a licenced landfill subject to acquiring a licence for soil movement from the NPWS.

Detailed records of all operations will be maintained throughout the project. These records will specifically focus on the exact areas excavated, the method of excavation, the depth of excavation, the volume of material (as numbers of truck loads) removed, an inventory of personnel and equipment entering and leaving the demarcated areas, and the operation of cleaning and disinfection facilities provided at each area.

5.4.4. Excavation and disposal on-site option

Deep burial in an on-site containment burial pit can be used in certain scenarios. Excavation must remove all Himalayan balsam infested soil and would be carried out in the same manner as for the ‘*Excavation and disposal off-site*’ method.

The site selection would take into account services, landscaping, transport routes, possibility of erosion and the future use of the site. The distance for contaminated material to be transported throughout the site would be minimised with the deep burial site located as close

as possible to the site of infestation. If the burial site is located in a different area to the infestation, biosecurity measures would be put in place including decontamination facilities and designated work and haulage areas.

Prior to excavation, the invasive plant material would be managed to remove any flowering plants and prevent seeding in the area. The disposal site would require the construction of a containment pit with no requirement for root barrier membrane. Once filled with Himalayan balsam contaminated material, the pit shall be sealed and then buried beneath 3 metres of inert backfill or uncontaminated soil. This method would map the location of the containment pit but would not require an ongoing management plan.

5.5. Rhododendron Management Options

5.5.1. Herbicide management option

Herbicide control can be highly successful in managing Rhododendron in combination with other mechanical methods. Prior to the site clearance works the sapling growth of the Rhododendron would be targeted and spot sprayed with suitable glyphosate-based herbicide solution. Foliar herbicide management should follow the manufacturers guidelines and be carried out by suitably trained staff, in possession of the relevant qualifications and wearing suitable PPE. Spraying will be carried out at a rate of 5liters/ha using knapsacks fitted with low pressure drift beta nozzles. An inert dye (super signal blue) will be mixed with the solution to ensure all plants at the site are treated. Extra care should be taken where infestations are located among or in close proximity to non-target plant species or any watercourse. Records of herbicide use must be maintained in accordance with relevant legislation. It is anticipated that natural vegetation regeneration will take place following the herbicide management practices and no enrichment or planting will be required.

5.5.2. Manual / Mechanical option

All mature growth would be flailed or uprooted with a mechanical digger or excavator and removed to a designated area where it would be mulched and rendered suitable for removal to a licenced landfill or through deep burial on site. All material to be retained on site for deep burial must be at least three metres below finished ground level. No impermeable root barrier membranes would be required for this method. The methodology would have the advantage of removing the entire root system of the plant thereby reducing the risk of cross contamination with other soils.

5.5.3. Combined mechanical and herbicide option

Herbicide application combined with manual methods have proven highly successful in the management of Rhododendron. This method has proven to be highly successful in the fight against Rhododendron and involves causing damage to the stem of the plant and directly applying a 14% herbicide solution. Rhododendron plants should be left in-situ with basal damage to the outer layer caused by hatchets or saws. This should be immediately followed by the targeted application of the herbicide solution. This method can result in the complete death of the target plant without the need for foliar spraying. Control using herbicide application would be required at least four weeks prior to any mechanical control works.

5.5.4. Monitoring post-treatment

Follow up monitoring following the combined herbicide and mechanical treatment should be carried out 6 to 8 weeks post treatment with a second round of combined management scheduled for that time. Monitoring will be required in the areas where works took place 12 months after the completion of mechanical removal works on site. Any plants or sapling growth that are observed at this time shall be recorded, mapped and scheduled for retreatment (Table 3.4).

5.5.5. Recommended management option for Rhododendron

Rhododendron throughout the development area shall be managed by the combined manual and direct herbicide application method. The direct herbicide method in advance of the construction phase will prevent any immediate ‘spread or dispersal’ of this species. This shall follow all manufacturers guidelines and shall be carried out by suitably qualified personnel wearing the correct PPE. While herbicide control may reduce the risk of accidental spread, additional management options will be required in advance of any construction works. As the project progresses and the installation of cables and development of infrastructure is required, the recommended management option for soils infested with Rhododendron, is excavation for disposal on-site. Rhododendron will be excavated, mulched and disposed of on-site. Strict biosecurity procedures will be required throughout the management works, including the use of covered biosecure trucks during transport of any Rhododendron plant material.

Although ‘excavation for disposal on-site’ is the most suitable option during the construction works, this will be reviewed in advance of any construction activities and final site-specific requirements will be confirmed, depending on the extents of infestations and proposed development in each area. The final management option for Sea buckthorn will be reviewed

and agreed upon with input from the relevant stakeholders including Local Authorities, Landowners, Coillte, the National Parks and Wildlife Service (NPWS) and any other stakeholders.

Table 5.3: Proposed management schedule for Rhododendron.

Year	Timing	Description of works	Treatment
2025	All year round	Manual control with direct herbicide application	Combined manual and herbicide application
2026	All year round	Manual control with direct herbicide application	Combined manual and herbicide application
2026*	6 to 8 weeks prior to mechanical control	Manual control with direct herbicide application	Combined manual and herbicide application
2026*	6 to 8 weeks post herbicide application	Mechanical management	Removal of plants and root systems before on-site chipping and disposal off site or deep burial.
2027*	12 months post mechanical control	Survey and herbicide retreatment as necessary	Herbicide treatment of sapling regrowth with follow up mechanical control 6 to 8 weeks post treatment
2028*	12 months post mechanical control	Survey and retreatment as necessary if additional regrowth was recorded in 202	Herbicide treatment and mechanical management if required.

*: Treatment undertaken as required and any treatment requirements will be aligned with commencement of construction activities within the development area

6. CONCLUSION

The ecological survey data provided by the client has been reviewed. The study area is characterised by dense pockets of non-native and IAS. This Invasive Species Management Plan provides the basis for the treatment, eradication or disposal of contaminated material. The recommendations contained in this plan form the basis for the management of IAS by the Client and their contractors during the works. This plan may be updated on foot of further surveys which may be carried out in due course.

The survey data has been mapped, recommendations for the control or eradication of IAS have been derived and are documented in this invasive species management plan. Biosecurity measures to prevent the potential spread of invasive species have also been derived and are documented in this plan. The contents of this plan are to be strictly adhered to by all personnel involved with the proposed works.

Of the species identified, the presence of Japanese Knotweed, Himalayan Balsam and Rhododendron are all First Schedule species within the works corridor. As a result, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing. Mitigation measures to prevent the spread of IAS have been outlined in this report.

7. BIOSECURITY

For the purposes of this document, biosecurity refers to all practical measures used to manage and prevent the introduction and spread of IAS.

A number of high impact aquatic and riparian IAS are currently present in Ireland, and most are continuing to spread aggressively. Prominent among the terrestrial IAPS are: Japanese knotweed (*Reynoutria japonica*), Giant knotweed (*Reynoutria sachalinensis*), Bohemian knotweed (*Reynoutria x bohemica*), Giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*). The above species are listed in the Third Schedule (Part 1) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) (as amended) and some are included among the list of 88 EU IAS of Union Concern (http://ec.europa.eu/environment/nature/pdf/IAS_brochure_species.pdf) in the EU Invasive Alien Species Regulations (1143/2014).

The ecological effects of IAPS are often irreversible and, once established, they are extremely difficult and costly to control and eradicate. Hence, the urgent need to prevent their introduction and spread. Prevention is clearly more cost-effective and less environmentally damaging than long-term containment, control or eradication. The most effective measure to reduce introductions and halt spread of IAS in aquatic situations is to promote and implement good biosecurity practice.

7.1. Biosecurity Standard Operating Procedure for Personnel and Equipment

This Biosecurity SOP applies to all equipment (hand tools and PPE) that are used during operations to control IAPS. The purpose of this SOP is to provide standardised practical methods for cleaning and disinfecting all equipment that comes into contact with IAPS while carrying out control works. This Biosecurity SOP will enhance existing biosecurity activity employed by the Council and will deliver an improved biosecurity system that will help limit the introduction and spread of IAPS during ongoing control operations.

All staff, be they Council or contract, that are involved in the control of IAPS should have access to cleaning and disinfection facilities that include, but is not limited to:

- detailed guide to proper cleaning and disinfection procedure, and instructions for making the correct disinfection concentration;
- clean water and Virkon Aquatic tablets or powder for the disinfection of equipment and PPE;

- hard-bristle brush;
- disposable non-latex gloves for equipment and PPE; and
- plastic bags and cable ties (for disposing of IAPS material removed from equipment).

[* Disinfectants must be used with care and in strict accordance with the manufacturer's instructions. Disposable gloves should be worn when using the disinfectant solution.]

Before commencing operations, a 1% Virkon Aquatic disinfection solution (10g Virkon Aquatic powder or 1 tablet in 1 litre of clean water) should be prepared for personnel working in infested areas. The disinfectant solution will remain pink in colour while it is still active. Additional clean water should be readily available for washing and for making up further disinfection solutions.

Best biosecurity practice will be achieved by ensuring that the following guidelines are adhered to when planning IAPS operations:

- Where possible, schedule operations so that uncontaminated sites can be accessed before sites that are known or suspected to support IAPS.
- Clean and disinfect all equipment prior to the commencement of operations.
- Clean and disinfect all equipment when moving between sites.
- Report suspected IAPS to personnel responsible for the control operations, accompanied by the location (GPS coordinates) and good quality photographs.

It is important that all PPE and equipment used are cleaned and disinfected according to the procedures below. These biosecurity measures should be conducted before leaving each site.

- Put on disposable gloves before cleaning and disinfecting the equipment.
- Visually inspect all equipment that has come into contact with water for evidence of attached IAPS material, or adherent mud or debris. Remove any such material before cleaning and disinfecting the equipment and leaving the site.
- Dispose of any IAPS material taken from the equipment using the plastic bags provided.
- Spray equipment with the disinfection solution to the point of run-off. Do not rinse in clean water for at least 15 minutes.

- Use the hard-bristle brush to remove all mud and debris from boots and equipment. Then spray with the prepared disinfectant solution onto the cleaned surfaces to the point of run-off. During inspection and cleaning, pay particular attention to places where IAPS could be accidentally trapped, such as the treads of boots and attachment points on equipment.
- Visually inspect all PPE that has been in contact with vector material and remove any attached IAPS material, or adherent mud or debris. Wipe down this PPE with an absorbent cloth soaked in the prepared disinfectant solution.
- Where time permits and it is practical, it is good biosecurity practice to air dry equipment following cleaning and disinfection.
- Remove disposable gloves and dispose of safely.

7.2. Biosecurity Standard Operating Procedure for light equipment (including hand-held tools, spraying equipment, sampling devices, strimmers)

Mobilisation

- All staff should have access to clean equipment prior to arrival on site.
- Designated work routes and any known invasive species infestations on or along the work site must be clearly demarcated before operations commence.

Operations

- Staff should avoid any known invasive species infestations and be watchful for any undocumented or unrecorded infestations.
- Staff or equipment will not unnecessarily encroach into any demarcated invasive species areas that they have had to enter or work close to.
- Staff will clean and disinfect their equipment when they exit an invasive species infested site.

Cleaning/Disinfection Post-operations

On completion of any field operation or when moving from one location to another, staff must clean and disinfect all equipment using the following protocol:

- Put on disposable gloves before cleaning and disinfecting equipment.
- Visually inspect all equipment for evidence of attached invasive species material or adherent mud or debris. Remove any such material before disinfecting the equipment.
- During inspection and cleaning, pay particular attention to places where invasive species could be accidentally trapped or obscured.

- Safely dispose of any invasive species material taken from the equipment in the plastic bags.
- Used equipment that has come into contact with water must be wiped down with an absorbent cloth soaked a 1% solution of Virkon Aquatic or another proprietary disinfectant.
- For heavily soiled boots and PPE, use the hard-bristle brush to remove mud and debris, and then spray with the disinfectant solution or use the Boot Bath to wash the soiled equipment in.
- If returning to the depot at the end of the day, it may be more efficient to conduct the more thorough cleaning operations at this facility.
- Remove disposable gloves and dispose of safely.

Where time permits and it is practical, it is good biosecurity practice to air dry equipment following cleaning and disinfection.

7.3. Biosecurity Standard Operating Procedure for light Machinery (including quad bikes, vehicles, lawnmowers)

Mobilisation

- Machinery should be visually inspected prior to arrival on site and all plant and animal material, mud or associated debris must be removed and safely disposed of in the plastic bags.
- Designated work routes and any known invasive species infestations on or along the work site must be clearly demarcated before operations commence.

Operations

- Staff should avoid any known invasive species infestations and be watchful for any undocumented or unrecorded infestations.
- Staff or machinery will not unnecessarily encroach into any demarcated invasive species areas.
- Staff will clean machinery when they leave an invasive species-infested site that they have had to enter or work close to. Where areas with invasive species are present that operators cannot avoid these sites should be treated before operations commence treated before operations commence and be accompanied by a site-specific Biosecurity Plan

Cleaning/Disinfection Post-operations

On completion of any field operation or when moving from one location to another, staff must clean and/or disinfect using the following protocol:

- Put on disposable gloves before cleaning and disinfecting equipment.
- Visually inspect all light machinery for evidence of attached invasive species material or adherent mud or debris. During inspection and cleaning, pay particular attention to

places where the seeds, fragments of invasive species or water could lodge or be accidentally trapped or concealed.

- Safely dispose of any invasive species material taken from the light machinery in plastic bags.
- Light machinery must be transported back to the depot or to a suitable location for thorough cleaning and/or disinfection.
- Before leaving a work site or location, all light machinery must be given at least a cursory cleaning. This will remove potentially contaminated material that could become detached during transit.
- Where light machinery or parts thereof (e.g. wheels of vehicles or quads) have come into contact with water (where invasive pathogens could be present), the affected parts should be sprayed with a 1% Virkon Aquatic solution or another proprietary disinfectant, using a knapsack with a high-volume nozzle, before leaving that site.
- On arrival at the depot in the evening or on completion of an operation, all light machinery must be further cleaned with a high-pressure steam cleaner, with water $\geq 45^{\circ}\text{C}$ or, alternatively, be power-hosed with cold water and then sprayed with a 1% Virkon Aquatic solution or another proprietary disinfectant using a knapsack with a high-volume nozzle. Ensure the wheels, undercarriage and anywhere that invasive species could be concealed or where water could be lodged, are cleaned. (This operation can be completed at some roadside garages, if facilities are not available at the depot.)

7.4. Biosecurity Standard Operating Procedure for Heavy plant (including tractors, trailers, low loaders, tracked vehicles, flails, dumpers, dredgers - wheeled and tracked, excavators)

Mobilisation

- All plant must arrive on site having been cleaned and disinfected. All commissioned plant that is arriving from abroad or from other parts of the country must be accompanied by a current certificate of disinfection.
- Designated work routes and any known invasive species infestations on or along the work site must be clearly demarcated before operations commence.

Operations

- Plant operators should avoid any known invasive species infestations, where possible, and be watchful for any undocumented or unrecorded infestations.
- Staff or plant will not unnecessarily encroach into any demarcated invasive species areas.
- Staff will clean plant on every occasion that it is removed from an infested site that they have had to enter or work close to. Where areas with invasive species are present that operators cannot avoid these sites should be treated before operations commence and be accompanied by a site specific Biosecurity Plan

Cleaning/Disinfection

On completion of any field operation or when moving from one location to another, staff must clean and disinfect using the following protocol:

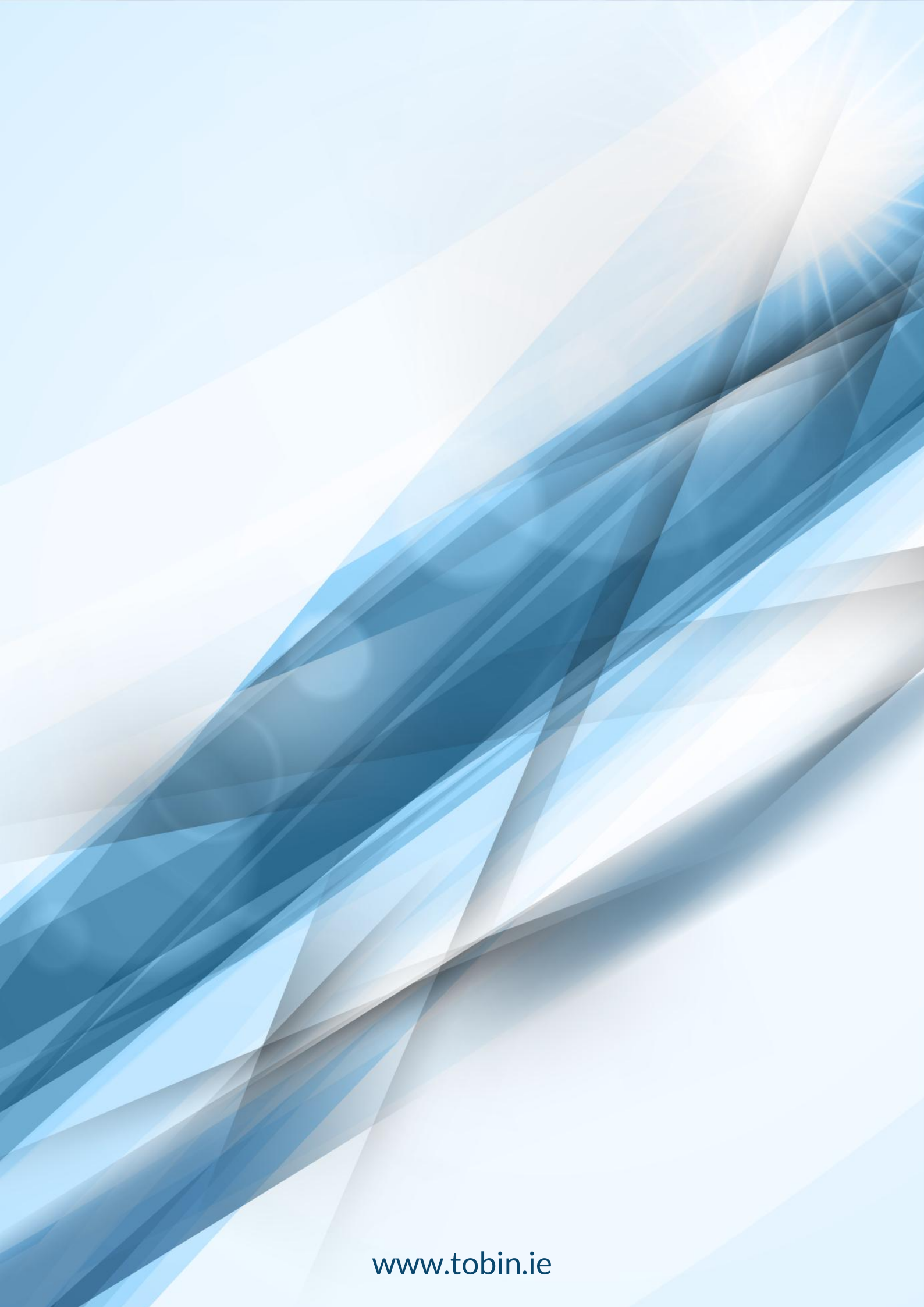
- When leaving a work site, ensure that any water is drained from any water-retaining compartments.
- Visually inspect all plant for evidence of attached invasive species material or adherent mud or debris. During inspection and cleaning, pay particular attention to places where water could lodge or where seeds or fragments of invasive species could be trapped or concealed. Particular attention must be paid to the cleats of tracked machines as these can accumulate large amounts of potentially contaminated soil. The tracks and buckets must be cleaned with a power washer, using clean water, before removing the machines from the site.
- Safely dispose of any invasive species material taken from the equipment in the plastic bags.
- Before leaving the work site or location, all plant must be given at least a cursory cleaning, with a power washer and using clean water. This will remove potentially contaminated material that could become detached during transit.
- On arrival at the depot in the evening or on completion of an operation, all plant must be further cleaned with a high-pressure steam cleaner, with water $\geq 45^{\circ}\text{C}$ or disinfected with a 1% Virkon Aquatic solution or another proprietary disinfectant, using a knapsack with a high-volume nozzle. Ensure the wheels, undercarriage and anywhere that invasive species could be concealed or where water could be lodged, are cleaned. (This operation can be completed at some roadside garages, if facilities are not available at the depot.)
- Where steam cleaning is not available, the plant should be power-hosed with cold water and then sprayed with disinfectant using a knapsack with a high-volume nozzle.

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