Natura Impact Statement

Ballydonagh Solar Farm Extension- Amendment Application

10/12/2025

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Neo Environmental Ltd	
Head Office - Glasgow: Wright Business Centre, 1 Lonmay Road, Glasgow G33 4EL T 0141 773 6262 E: info@neo-environmental.co.uk	**Bristol Office** Spaces 8th Floor The Programme Building Bristol BS1 2NB T: 01174 571 610 E: info@neo-environmental.ie
Warrington Office: Lakeview 600, Lakeside Drive Centre Park Square Warrington WA1 1RW T: 01925 661 716 E: info@neo-environmental.co.uk	**Rugby Office:** Valiant Suites, Lumonics House, Valley Drive, Swift Valley, Rugby Warwickshire CV21 1TQ T: 01788 297012 E: info@neo-environmental.co.uk
Ireland Office: C/O Origin Enterprises PLC, 4-6 Riverwalk, Citywest Business Campus Dublin 24, D24 DCW0 T: 00 353 (1) 5634900 E: info@neo-environmental.ie	**Northern Ireland Office:** 83-85 Bridge Street Ballymena, Co. Antrim BT43 5EN T: 0282 565 04 13 E: info@neo-environmental.co.uk

Prepared For:

Ballydonagh Solar Limited on behalf of Renewable Energy Systems (RES) Ltd

Prepared By:

Rhona Coghlan BSc (Hons)

	Name	Date
Edited By:	Rhona Coghlan	01/12/2025
Checked By:	Conor Cochrane	04/12/2025
	Name	**Signature**
Approved By	Paul Neary	

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EXECUTIVE SUMMARY

1.1. A Stage 2 Natura Impact Statement (NIS) has been undertaken for amended solar farm extension in the townlands of Ballydonagh, Cloonineen, Skecoor, Lisheenaguil, Kiltormer East, Co. Galway, (the "Application Site") to assess the impacts of the proposal on the integrity of European Designated sites within 15km, considering the conservation objectives of the sites and their ecological structure and function.

1.2. Within the 15km zone of influence (ZOI) surrounding the Application Site there are ten European Designated Sites. These consist of; four Special Protection Areas (SPAs); River Suck Callows SPA, River Little Brosna Callows SPA, Middle Shannon Callows SPA, and Lough Derg (Shannon) SPA and six Special Areas of Conservation (SACs); Ardgraigue Bog SAC, Glenloughaun Esker SAC, River Shannon Callows SAC, Redwood Bog SAC, Lough Derg, North-east shore SAC and Barroughter Bog SAC.

1.3. It has been concluded that there is potential for ecological connectivity between the Application Site and the River Suck Callows SAC and limited hydrological connectivity exists from the Lough Derg, North-east Shore SAC (26.85km downriver), to the Application Site due to the Ardultagh stream that intersects the site. Additionally, there is potential for ornithological connectivity between the Application Site and the River Suck Callows SPA, River Little Brosna Callows SPA and Middle Shannon Callows SPA providing a pathway for potential impacts. There is limited hydrological connectivity between the Application Site and the Lough Derg (Shannon) SPA. The main qualifying features of these six sites have been outlined and assessed in full in this report.

1.4. As no connectivity (pathway for impacts) exists between the Application Site and the remaining European designated sites within the study area, these have been 'scoped out' from further assessment.

1.5. With the implementation of integral design measures, mitigation and best practice construction methods, it can be concluded that the Amended Development **will not have a significant effect upon any qualifying features, and therefore the integrity, of any European sites connected with the Application Site**.

INTRODUCTION

Background

1.6. Neo Environmental Ltd has been appointed by Renewable Energy Systems (RES) Ltd on behalf of Ballydonagh Solar Limited (the "Applicant") to undertake a Natura Impact Statement (NIS) for an amended solar farm extension (the "Amended Development") to the Ballydonagh Solar Farm (Ref: 24/61749) in the townlands of Ballydonagh, Cloonineen, Skecoor, Lisheenaguil, Kiltormer East, Co. Galway (the "Application Site").

1.7. Please see Figure 103 for the layout of the Amended Development.

1.8. An amended Ecological Impact Assessment (EcIA) and Biodiversity Management Plan (BMP) have also been undertaken for the Amended Development and should be read in conjunction with this NIS.

Background

1.9. The Application Site was confirmed as an appropriate location for solar energy development in July 2025 when Galway County Council granted permission under Planning Reference 24/61749.

1.10. Planning Permission was granted following a full planning and environmental assessment. The consented scheme includes ground mounted solar PV panels on metal support structures, electrical transformer and inverter substation modules, temporary construction compounds, internal access tracks (existing, upgraded and new), site accesses, watercourse crossing infrastructure, security fencing, underground cabling and ducting, interconnection cabling, CCTV infrastructure, drainage measures, landscaping and habitat enhancement, together with all associated site development works. The solar farm was approved for an operational period of 35 years and was accompanied by a Natura Impact Statement.

Proposed Amendment

1.11. The Proposed Amendment will consist of an amendment to previously approved planning permission ref 24/61749 comprising the following;

- Combined central inverters and MV transformers are replaced by separate string inverters and central MV transformers which results in a reduction in the extent of associated hardstanding areas; and

- Alteration to Condition 3(a) to extend the operational lifetime of the solar farm from 35 years to 40 years, reflecting the design life of the updated technology and contemporary industry practice for solar developments.
- Addition of tables in the former central inverter locations

Site Description

1.12. The area of the Amended Development (the "Application Site") lies at an elevation of approximately 67 – 84m AOD and covers a total area of c. 56.2 hectares across 4 sections of land. It is centred at approximate Irish Grid Reference (IGR) X (ITM) X 584278 Y 718703 and is located c. 2.3 km west of the R355. It is approximately 11km south-southwest of Ballinasloe,15.5km north of Portumna, 17km west-northwest of Banagher and 20km east of Loughrea.

1.13. The Application Site comprises of 17 fields of agricultural land primarily used for pastoral farming and bound by trees, hedgerows and post-and-wire fencing. The surrounding context is predominately agriculture with pockets of forestry and peatland and punctuated by individual properties, farmsteads and ribbon development associated with the minor and regional road network. Fields are typically small to medium in scale and similar in character to the Application Site lands.

1.14. However, nearby settlements within the study area including Kiltormer (c. 1km northwest) and Laurencetown (c. 3.9km northeast) contain a range of land uses including commercial, recreational and ecclesiastical. The Killoran river is c. 0.9km southwest of the site at its closest point.

Access to the northwest section of the Application Site will be gained from the L4322 to the north. Access to the southeast and southwest sections of the Application Site will be accessed from an unnamed road that connects to the L8716 which is c. 1km east-northeast

Adopted Design Principles

1.15. Measures incorporated into the Amended Development design include the following:

- A 5m buffer from hedgerows.
- 2m field drain buffer
- 10m OHL buffer
- 10m Arterial Drainage Scheme watercourse buffer
- 5 x 60m Zone of notification buffers
- Various residential setbacks

- Various tree buffers dependant on size of tree
- 9 x 30m badger buffer
- Flood Zone Area (Panels Only)

Statement of Authority

1.16. The assessment has been conducted by qualified ecologists. Laura Stenson was the main ecologist involved in the production of report. Additionally, senior ecologist (Dara Dunlop), also provided specialist input. All work has been carried out in line with the relevant professional guidance; CIEEM's Guidelines for Report Writing[1] and the Environment, Heritage and Local Government's Guidance on Appropriate Assessments[2] .

1.17. Louis Maloney has five years of professional ecological experience. This includes terrestrial habitat, mammal and marine ecology surveys, and the management of Environmental Impact Assessment ("EIA"), Natura Impact Statement ("NIS"), Ecological Impact Assessment ("EcIA"), Biodiversity Management Plan ("BMP") and Net Gain Assessment ("NGA") reports. He holds a BSc in Marine Science from the National University of Ireland, and an MSc in Conservation Behaviour – Marine and Terrestrial Science. Louis is in the process of applying for an Associate level membership with CIEEM.

1.18. Dara Dunlop BSc (Hons) is a Qualifying Member of CIEEM with circa 4 years' experience in the ecology sector, including working for an ecological consultancy, undertaking a range of protected species surveys and extended Phase 1 habitat surveys and Fossitt habitat surveys for industrial schemes. Dara has authored a number of reports including Ecological Impact Assessments, Appropriate Assessments and Protected Species Reports for various developments.

1.19. Rhona Coghlan is an Assistant Ecologist with over 1 year experience in the ecology and conservation industry. Rhona has been awarded a 1:1 BSc in Environmental Science from the National University of Galway and is a Qualifying Member of the Chartered Institute for Ecology and Environmental Management. Rhona has conducted Fossitt Habitat surveys, Breeding and Wintering Bird surveys, Bat surveys, Otter surveys, and aquatic invertebrate surveys. Rhona has authored Natura Impact Statements, Ecological Impact Assessment, Biodiversity Management Plans, Q-value reports, Wintering Bird reports and more. Rhona is appointed ECoW for two wind farm development and has experience with client-facing consultations and survey reports. Rhona has taken part in several training events organised by CIEEM, The British Trust for Ornithology and Birdwatch Ireland

[1] CIEEM, (2017). Guidelines for Report Writing. Available at www.cieem.net

[2] Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities. Available at www.npws.ie

LEGISLATION

Requirement for Appropriate Assessment

1.20. The requirement for Appropriate Assessment (AA) of plans or projects originates from Article 6 (3) and (4) of European Union (EU) Habitats Directive. This is implemented in Ireland through the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (as amended).

1.21. The wording of Article 6 (3) of the Directive is as follows:

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

1.22. As outlined in the European Commission document 'Assessment of plans and projects significantly affecting European Designated sites'[3], any project that is not directly connected with or necessary to the management of a European Designated site, but likely to have a significant effect upon it, either individually or cumulatively will be subject to Appropriate Assessment. Furthermore, the European Commission's most recent guidance on Article 6: "Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC"[4] has also been considered.

1.23. Where significant effects are uncertain or unknown at the screening stage an AA will be required, due to the need to apply the precautionary principle. Conversely, if a project will have impacts on a site, but these impacts will clearly not affect or undermine those conservation objectives, it is not considered that it will have a significant effect on the site concerned.

1.24. The aim of Stage 2, 'Natura Impact Statement' is to inform the assessment of the impacts of the Amended Development on the integrity of the European Designated site, considering the conservation objectives of the site and its ecological structure and function. This is done by considering the type of development and the conservation objectives of any European

[3] European Commission (2021) *Assessment of plans and projects in relation to Natura 2000 sites, Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats directive 92/43/EEC*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021XC1028%2802%29

[4] Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (European Commission, 2018)

Designated sites which may be impacted. The NIS will assess connectivity between the development and the European Designated sites and their qualifying interests.

1.25. In addition, s177(T)1(b) and (2) of the Planning and Development Act 2000 (as amended) sets out the requirements for an NIS and states:

"s177(T) (1)(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a Proposed Development, on its own or in combination with other plans or projects, for one or more than one F722 [European site], in view of the conservation objectives of the site or sites.

(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one F722 [European site] in view of the conservation objectives of the site or sites."

Mitigation

1.26. The European Commission (EC 2001) states that mitigation should not be considered during the AA (i.e. Stage 1) Screening stage. On 12th April 2018, the Courts of Justice of the EU (CJEU) ruled in case C-323/17 (*People over Wind v Coillte*) that measures intended to avoid or reduce a proposed plan or project's harmful effects on a European site ('mitigation measures') cannot be considered during the Screening for AA stage.

1.27. Therefore, unless it can be shown that the proposed plan or project would not have a significant effect on the conservation objectives of the relevant European site in the absence of mitigation, it is necessary to carry out a Stage 2 AA. Mitigation measures should be considered at Stage 2, when a 'full and precise analysis' can be carried out. This is contrary to the previous guidance whereby inherent mitigation at the screening stage could be considered.

The Precautionary Principal

1.28. The Precautionary Principle, is referenced in Article 191 of the Treaty on the Functioning of the EU, is defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:

When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis.

1.29. The reasoned employment of the 'Precautionary Principle' is fundamental to every AA.

ASSESSMENT METHODOLOGY

Stages of Appropriate Assessment

1.30. The AA process comprises of four stages in order to identify whether proposals have the potential to significantly impact upon European designations. The stages are as follows:

- Stage 1 Screening: To determine the likelihood of significant impacts.
- Stage 2 Natura Impact Statement: To assess the impact of proposals on the integrity of the European Designated site, considering the conservation objectives of the site and its ecological structure and function.
- Stage 3 Assessment of alternatives: Where significant impacts are anticipated despite mitigation measures, the proposal should progress to Stage 3 and consider alternatives or no longer proceed.
- Stage 4 Assessment where no alternative exists and where adverse impacts remain: The final stage involves examining whether there are imperative reasons of overriding public interest for allowing the proposal to adversely impact upon a European Designated site.

Source – Pathway - Receptor Model

1.31. The 'source-pathway-receptor' conceptual model is a tool used for environmental assessment. In order for an effect to occur, all elements of this model must be linked. The removal or absence of one of the elements of the model results in there being no likelihood for the effect in question to occur. For example:

- Source(s), e.g., blasting;
- Pathway(s) e.g., vibration and noise; and,
- Receptor(s) e.g., disturbance of nesting birds.

1.32. For an NIS, this model is focused solely on the selection features of European Designated sites as defined by National Parks and Wildlife Services (NPWS) and referenced within this report.

1.33. The Amended Development may have the potential to result in a number of impacts, which could potentially affect the selection features of European Designated sites. The analysis of these effects, using scientific knowledge and professional judgement, leads to the identification of a "zone of influence" for each effect (i.e., the distance at which the impact of

the Amended Development could have potential effects, using professional judgement and published guidance).

Study Zone Identification

1.34. The 'Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities'[5] states that the NIS should include the following:

- *"Any Natura 2000 sites within or adjacent to the plan or project area.*
- *Any Natura 2000 sites within the likely zone of impact of the plan or project.*
- *A distance of 15km is currently recommended in the case of plans, and derives from UK guidance (Scott Wilson et. al., 2006). For projects, the distance could be much less than 15km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. In some instances, connectivity may go beyond 15k and will also need to be considered.*
- *Natura 2000 sites that are more than 15km from the plan or project area depending on the likely impacts of the plan or project, and the sensitivities of the ecological receptors, bearing in mind the precautionary principle. In the case of sites with water dependent habitats or species, and a plan or project that could affect water quality or quantity, for example, it may be necessary to consider the full extent of the upstream and/or downstream catchment."*

1.35. It is considered that the ZOI for the European designated sites and their qualifying features will fall within a 15km radius of developments.

1.36. Sites further than 15km from the Amended Development with a hydrological connection have been considered. These sites are not considered to fall with ZOI, for reasons outlined below.

Desk Study

1.37. Sources of material that were consulted as part of the desk study for the purposes of the assessment are as follows:

[5] Department for Environment, Heritage and Local Government (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Available at: http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

- NPWS natural heritage database for European Designated sites within the 15km ZOI of the Application Site[6];
- NPWS site synopses, Natura 2000 Data Form and conservation objectives relating to each site and aerial images;
- Environmental Protection Agency (EPA) interactive maps[7].

Impact Assessment Process

1.38. The assessment process involves:

- Identifying and characterising European Designated sites identified within the 15km zone of influence surrounding the Application Site and their qualifying features and addressing whether any of these designated sites have any connectivity with the Amended Development. If any site is found to have no connectivity, then these designated sites will be 'scoped out' or not considered further;
- Using the Source-Pathway-Receptor model, assess whether there will be any significant impacts to any of the European Designated site, in regard to changes that result from the construction, operation and decommissioning phases of a project. Qualifying features of a European Designated site that lie outside of the ZOI and not subject to any impacts from the Amended Development then these will be 'scoped out' or not considered further;
- Identify any significant impacts on the integrity of the European Designated site from the development and 'in combination' with any other development within 5km;
- Identify the need for the AA process to move to Stage 3: 'Assessment of alternatives' or, if there are no impacts from the development, the competent authority may allow the development to proceed, subject to other requirements being satisfied.

[6] Environment, Heritage and Local Government (2009) Appropriate Assessment of Plan and Projects in Ireland. Available at: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

[7] Available at: https://gis.epa.ie/EPAMaps/

STAGE 1: APPROPRIATE ASSESSMENT SCREENING

1.39. In accordance with NPWS guidance, this stage of the AA has identified all European Designated sites located within 15km of the Application Site and potential impacts associated with the Amended Development have been identified. Those European Designated sites which will not be significantly impacted upon will be ruled out of any further assessment.

1.40. Potential impacts can depend more on the nature of impacts, sensitivity of receptors and causal linkage, rather than actual distances. The assessment below considers connectivity, either ecological, ornithological or hydrological, that may exist between the Amended Development and the designated sites.

Identification of European Designated Sites

1.41. There are four SPAs and six SACs located within 15km of the Application Site. The designated features of each have been outlined within **Table 1-1** below. **Figure 1, Appendix A** of this report details the location of these sites in relation to the Amended Development.

Table 1-1: European Designated sites within 15km

Site Code	Site Name	Qualifying Features	Distance (km)	Potential Connectivity with the Amended Development Site
SPA				
004097	River Suck Callows SPA	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Golden Plover (Pluvialis apricaria) [A140] Lapwing (*Vanellus vanellus*) [A142] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetland and Waterbirds [A999]	7.75km Northeast	Potential ornithological

004096	Middle Shannon Callows SPA	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Corncrake (*Crex crex*) [A122] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142]	9.17km Southeast	Potential ornithological
004086	River Little Brosna Callows SPA	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Wetland and Waterbirds [A999]	11.65km Southeast	Potential ornithological
004058	Lough Derg (Shannon) SPA	Cormorant (Phalacrocorax carbo) [A017]	14.14km South	Limited Hydrological Connectivity

		Tufted Duck (Aythya fuligula) [A061] Goldeneye (Bucephala clangula) [A067] Common Tern (Sterna hirundo) [A193] Wetland and Waterbirds [A999]		
SAC				
002356	Ardgraigue Bog SAC	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150]	3.66km South	None
002213	Glenloughaun Esker SAC	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	6.73km North	None
000216	River Shannon Callows SAC	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with *Alnus glutinosa* and *Fraxinus*	9.52km Southeast	Ecological connectivity

		excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] *Lutra lutra* (Otter) [1355]		
002353	Redwood Bog SAC	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150]	10.95km South-east	None
002241	Lough Derg, North-east Shore SAC	Juniperus communis formations on heaths or calcareous grasslands [5130] Calcareous fens *with Cladium mariscus* and species of the *Caricion davallianae* [7210] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0] Taxus baccata woods of the British Isles [91J0]	14.17km South	Potential limited hydrological connectivity
000231	Barroughter Bog SAC	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150]	14.7 South-West	None

1.42. As shown in Table 1-1, the Application Site is not located within or directly adjacent to any European Designated site.

1.43. Four SPAs are located within 15km of the Application Site, these being the River Suck Callows SPA, River Little Brosna Callows SPA, Middle Shannon Callows SPA and Lough Derg (Shannon) SPA. Each of these SPAs have been designated to protect an assemblage of waterbirds and wetland habitat. It is considered that there is potential for these birds to utilise habitats within the Application Sites, therefore these SPAs will be considered further in this assessment.

1.44. Six SACs are within 15km of the Application Site, these being the Ardgraigue Bog SAC, Glenloughaun Esker SAC, River Shannon Callows SAC, Redwood Bog SAC, Lough Derg North-east Shore SAC and Barroughter Bog SAC. The River Shannon Callows SAC was assessed for connectivity, and it was concluded that ecological connectivity exists from the SAC to the Application Site due to its highly mobile qualifying feature, otter. Therefore, the River Shannon Callows SAC will be considered further in this assessment. Lough Derg, North-east Shore SAC was briefly assessed for connectivity, and it was concluded that limited hydrological connectivity exists from the SAC to the Application Site due to the Ardultagh stream that intersects the site. Although this stream travels for 26.85km south before it reaches the SAC. it has been scoped in and has been assessed within the Stage 2 section of this report.

1.45. The Ardgraigue Bog SAC, Glenloughaun Esker SAC, Redwood Bog SAC and Barroughter Bog SAC are all designated for terrestrial habitats and are all more than 3.5km from the Application Site. No hydrological or ecological connectivity exists between these SACs and the Application Site. Where connectivity does not exist, there are no pathways for likely impacts, therefore the European Designated sites within the study area that do not have connectivity with the Application Site will not be considered further within this assessment.

1.46. Given the potential for connectivity between the Amended Development and one or more of the above European Designated Sites, it has been deduced that progression to a Stage 2 Natura Impact Statement is necessary in order to assess the impact of proposal on the integrity of the European Designated sites with connectivity, considering the conservation objectives of such sites and its ecological structure and function. As such, mitigation measures have been included within the following sections of this report.

IMPACT ASSESSMENT

1.47. Standard best practice pollution prevention measures will be adhered, which will reduce the potential for impacts on ecology during the construction stage. As these are standard requirements, they are separate to mitigation measures which are outlined later in this report.

1.48. Relevant measures include but are not limited to:

Pollution Prevention

- Hydrocarbons, greases and hydraulic fluids will be stored in a secure compound area;
- All plant machinery will be properly serviced and maintained thereby reducing risk of spillage or leakage;
- All waste produced from construction will be collected in skips with the construction site kept tidy at all times;
- Excavated soil will be stored on site or removed by a licensed waste disposal unit;
- All materials and substances used for construction will be stored in a secure compound and all chemicals to be stored in secure containers to avoid potential contamination; and
- Location of spill kit to be known by all construction workers and implemented in the event of spillage or leakage.

Waste management

- Skips are to be used for site waste/debris at all times and collected regularly or when full;
- All hydrocarbons and fluids are to be collected in leak-proof containers and removed from site for disposal or recycling; and
- All waste from construction is to be stored within the site confines and removed to a permitted waste facility.

Environmental monitoring

- Contractor to nominate member of staff as the environmental officer with the responsibility to ensure best practice measures are implemented and adhered to, with any incidents or non-compliance issues being reported to the project team.

Assessment of Impacts

1.49. This section discusses and evaluates the likely impacts of the Amended Development on the River Suck Callows SPA, River Little Brosna Callows SPA, Middle Shannon Callows SPA, the River Shannon Callows SAC and Lough Derg (Shannon) SPA which are the only European designated sites with connectivity to the Application Site. As outlined previously the Application Site does not have connectivity with the remaining European designated sites within the study area and have therefore been 'scoped out' of this assessment.

1.50. Potential impacts for ecological features associated with a European designated site from the construction, operation and decommissioning of a solar farm may occur from the contamination of surface and/or ground waters. Those features (species) which are ecologically connected to a development site, and are mobile, may be impacted upon through disturbance as well as loss of habitat through contamination of surface waters.

1.51. Aquatic systems and the species/habitats which are dependent on these systems are sensitive to pollution/contamination of surface waters. Pollution can result from any of the following entering a body of surface or groundwater:

- Poisonous, noxious or polluting matter;
- Waste matter (including silt, cement, concrete, oil, petroleum spirit, chemicals, solvents, sewage and other polluting matter);
- Other harmful activities detrimentally affecting the status of a waterbody.

1.52. The status of a waterbody can be affected not only by chemical pollution, but also by activities directly or indirectly affecting ecology, including changes in physio-chemical parameters such as temperature and turbidity or physical modification to the hydrology of a waterbody.

1.53. Table 1-2 below details common water pollutants and their effect on the aquatic environment (Table extracted from Ciria guidance[8]).

[8] Ciria (2015) Environmental good practice on site guide, fourth edition

Table 1-2: Common water pollutants and their effects on the aquatic environment

Common Water Pollutants	Adverse effect on aquatic environment
Silt	Reduces water quality, clogs fish gills, covers aquatic plants, impacts aquatic invertebrates, leads to a reduction in prey for species including otter and fish species, leads to degradation of habitat including that of juvenile freshwater pearl mussels
Bentonite (very fine silt)	Reduces water quality, clogs fish gills, covers aquatic plants, impacts aquatic invertebrates, leads to a reduction in prey for species including otter and fish species, leads to degradation of habitat including that of juvenile freshwater pearl mussels
Cement or concrete wash water (highly alkaline)	Changes the chemical balance, is toxic to fish and other wildlife. This can lead to direct impacts for aquatic species (including otter), or indirect through loss of prey resources
Detergent	Removed dissolved oxygen, can be toxic to fish and other wildlife present within the aquatic environment
Hydrocarbons (e.g. oil, diesel)	Suffocates aquatic life, damaging to the wildlife (e.g. birds), and to water supplies including industrial abstractions
Sewage	Reduces water quality, is toxic to aquatic wildlife including otter, and damages water supplies

1.54. An integral part of the Amended Development design involves methods for controlling the movement of surface water within the Application Site. Movement of surface water will be managed by a Sustainable Drainage System (SuDS) following best practice guidelines on the use of SuDS[9].

[9] Ciria (2007) The SuDS Manual. Available at: https://www.ciria.org/

1.55. The proposed drainage strategy (see **Technical Appendix 4: Flood Risk and Drainage Impact Assessment; Volume 3**[10] in planning reference: 24/61749 for further details) proposes the construction of multiple filter drains/soakaways within the Application Site. The locations of the schemes have been chosen on the downward slope or near to existing watercourses or drainage features or on the external boundary of any field which has a relatively steep gradient. The idea is to capture any overland flow in the SuDS device before infiltrating into the surrounding soils.

1.56. Operations and activities that have the potential to impact on the water environment will be regularly monitored throughout the construction of the Amended Development. This is to ensure compliance with planning conditions and environmental regulations. The Site Manager is responsible for ensuring that all monitoring is carried out according to the Environmental Monitoring Programme, summarised in **Table 1-3**.

Table 1-3: Environmental Monitoring

Environmental Aspect	Monitoring Location	Monitoring Frequency	Monitoring Arrangements
Site housekeeping	Entire site	Daily	Visual inspection
Surface water courses	All water courses	After periods of rain Weekly, if no rain	Visual inspection
Fuels and chemicals – appropriate storage	Entire site	Daily	Visual inspection

1.57. These records and results will be maintained by the Site Manager and will be stored on site during the construction phase.

1.58. These measures will **significantly reduce the potential** for contaminated surface waters entering the aquatic environment.

River Suck Callows SPA

1.59. The River Suck Callows SPA is designated for its importance for the following species:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]

[10] McGhee, M. *Technical Appendix 4: Flood Risk and Drainage Impact Assessment Ballydonagh Solar Farm. Neo Environmental Ltd.*

- Lapwing (*Vanellus vanellus*) [A142]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

Conservation Objectives for River Suck Callows SPA

1.60. There are two main conservation objectives[11] of the River Suck Callows SPA. One is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. The second conservation objective is to maintain or restore the favourable conservation condition of the wetland habitat at River Suck Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Character of the Qualifying Interests of River Suck Callows SPA

1.61. Table 1-4 below identifies the percentage of the extent of various habitat types within the SPA.

Table 1-4: Qualifying Habitats of the River Suck Callows SPA and their extent within the site

Code	Qualifying Habitats	Extent and Character (%)
N06	Inland water bodies (Standing water, Running water)	20
N07	Bogs, Marshes, Water fringed vegetation, Fens	10
N10	Humid grassland, Mesophile grassland	30
N14	Improved grassland	40
Total Habitat Cover		100

Threats and Pressures on River Suck Callows SPA

1.62. Table 1-5 lists the threats, pressures and activities impacting the River Suck Callows SPA.

[11] NPWS (2022) Conservation Objectives: River Suck Callows SPA 004077. Version 9.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Table 1-5: Threats, pressures and activities impacting River Suck Callows SPA

Code	Threats and Pressures	Rank	+/-	Inside/Outside
A03	Mowing / cutting of grassland	M	+/-	i
A04	Grazing	H	+/-	o
A04	Grazing	M	+/-	i
A08	Fertilisation	H	-	o
A08	Fertilisation	M	-	i
B	Sylviculture, forestry	L	-	o
E01.03	Dispersed habitation	M	+/-	o
F02.03	Leisure fishing	L	+/-	i
F03.01	Hunting	L	-	i
G01.01	Nautical sports	M	+/-	i

Rank: H = High, M = Medium, L = Low I = inside, O = outside, B = both +/- = Positive/Negative Impact

Assessment of Likely Impacts Affecting the River Suck Callows SPA

1.63. The River Suck Callows SPA is located approximately 7.75km northeast of the Application Site and has been designated for a number of important bird species of the E.U. Habitats Directive, which are detailed within **Table 1-1** above.

1.64. The River Suck Callows SPA stretches from a section of the River Suck from Castlecoote, Co. Roscommon to its confluence with the River Shannon near the town of Shannonbridge, with a total distance of c. 70km. The site comprises of areas of seasonally flooded semi-natural lowland wet callow grassland and the river itself.

1.65. Given the Amended Development site's proximity to the SPA, and the qualifying bird species for which the SPA is designated, potential for ornithological connectivity has been closely considered.

1.66. The ecology of the following qualifying bird species was assessed: Whooper Swan (*Cygnus cygnus*), Golden Plover (*Pluvialis apricaria*), Lapwing (*Vanellus vanellus*), Greenland White-fronted Goose (*Anser albifrons flavirostris*). Although it is considered unlikely for these bird species to utilise the site (see **Appendix B – Wintering Bird Survey Report**), some of them are known to frequent grassland habitat, and at worst, will be subject to short term habitat displacement during construction. The surrounds of the Application Site mainly comprise of agricultural land, thus providing ample amount of suitable habitat for these species to be displaced to. In addition, these qualifying bird species' core foraging ranges were assessed.

Research indicates that these species core foraging ranges are less than 5km[12][13][14], as the SPA is 6.39km northeast of the Application Site and provides richer feeding areas, **potential for significant adverse effects are considered unlikely as these bird species were not identified during Wintering Bird Surveys (see Appendix B).**

1.67. Wigeon (*Anas Penelope)* is the final qualifying feature that needs to be assessed. No scientific literature disclosing its core foraging range was found. The ideal habitat for this species is wetland habitat that is surrounded by sparse open forest, woodland and especially agricultural land[15][16]. When considering that the site is not immediately surrounding the wetland habitat of the SPA and the SPA provides a more suitable and richer feeding grounds for Wigeon, it has been concluded that Wigeon are unlikely to use the Application Site and none were recorded during the Wintering Bird Surveys (**Appendix B**), therefore, there is **no potential for significant adverse effects** on this species as a result of the Amended Development.

1.68. No significant loss of suitable habitat (direct or indirect) is anticipated for these species through the construction of the Amended Development.

1.69. Given the level of suitable habitat within the wider landscape, it is considered that the potential noise disturbance from the construction and post-construction phases will not be significant for qualifying species associated with the SPA. It is considered that the Amended Development will **not result in significant adverse effects** for these qualifying bird species of the SPA.

1.70. The River Suck Callows SPA is also designated for wetland habitat as a resource for the regularly occurring migratory waterbirds, however no connectivity exists, therefore there is **no potential for significant adverse effects** on this qualifying habitat.

1.71. The Amended Development will **not result in significant adverse effects to the integrity** of the River Suck Callows SPA.

Middle Shannon Callows SPA

1.72. The Middle Shannon Callows SPA is designated for its importance for the following species:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]

[12]Scottish Natural Heritage. Assessing Connectivity with Special Protection Areas (SPAs). Available at: file:///C:/Users/User/Downloads/Assessing%20connectivity%20with%20special%20protection%20areas%20(4).pdf
[13] Spatial distribution of breeding meadow birds – implications for conservation and research. Available at: https://www.cr-reading.nl/V4/infopages/WaderStudyGroupPublication.pdf
[14] Managing grassland for wild geese in Britain: a review. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0006320798001347?via%3Dihub
[15] Kretchmar, A. V. 1994. Eurasian wigeon (*Anas penelope*) in north-eastern Asia. Zoologichesky Zhurnal 73(5): 68-79.
[16] MKear, J. 2005. Ducks, geese and swans volume 2: species accounts (Cairina to Mergus). Oxford University Press, Oxford, U.K.

- Corncrake (*Crex crex*) [A122]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Wetland and Waterbirds [A999]

Conservation Objectives for Middle Shannon Callows SPA

1.73. There are two main conservation objectives[17] of the Middle Shannon Callows SPA. One is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. The second conservation objective is to maintain or restore the favourable conservation condition of the wetland habitat at River Little Brosna Callows SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

Character of the Qualifying Interests of Middle Shannon Callows SPA

1.74. Table 1-6 below identifies the percentage of the extent of various habitat types within the SPA.

Table 1-6: Qualifying Habitats of the Middle Shannon Callows and their extent within the site

Code	Qualifying Habitats	Extent and Character (%)
N06	Inland water bodies (Standing water, Running water)	15
N07	Bogs, Marshes, Water fringed vegetation, Fens	5
N09	Dry grassland, Steppes	1
N10	Humid grassland, Mesophile grassland	50
N14	Improved grassland	27
N16	Broad-leaved deciduous woodland	1
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	1

[17] NPWS (2022) Conservation objectives for Middle Shannon Callows SPA [004096]. Generic Version 9.0. Department of Housing, Local Government and Heritage.

Total Habitat Cover	100

Threats and Pressures on Middle Shannon Callows SPA

1.75. Table 1-7 lists the threats, pressures and activities impacting the Middle Shannon Callows SPA.

Table 1-7: Threats, pressures and activities impacting Middle Shannon Callows SPA

Code	Threats and Pressures	Rank	+/-	Inside/Outside
A03	Mowing / cutting of grassland	H	+	i
A04	Grazing	H	+/-	i
A04.03	Abandonment of pastoral systems, lack of grazing	L	+/-	i
A08	Fertilisation	L	-	i
A08	Fertilisation	M	-	o
D01.01	Sylviculture, forestry	L	+/-	i
D01.05	Bridge, viaduct	H	+/-	i
E01	Urbanised areas, human habitation	H	-	o
F02.03	Leisure fishing	M	+/-	i
F03.01	Hunting	L	+/-	i
G01.01	Nautical sports	H	+/-	i
G01.02	Walking, horseriding and non-motorised vehicles	M	+/-	i

Rank: H = High, M = Medium, L = Low, I = inside, O = outside, B = both, +/- = Positive/Negative Impact

Assessment of Likely Impacts Affecting the Middle Shannon Callows SPA

1.76. The Middle Shannon Callows SPA is located approximately 9.17km southeast of the Application Site and has been designated for a number of important bird species of the E.U. Habitats Directive, which are detailed within Table 1-1 above.

1.77. The Middle Shannon Callows SPA is a diverse site that stretches from the town of Athlone to Portumna and is approximately 50km in length. The site comprises of an extensive area of seasonally flooded semi-natural, lowland wet grassland, along both sides of the river and the river itself.

1.78. Given the Amended Development site's proximity to the SPA, and the qualifying bird species for which the SPA is designated, potential for ornithological connectivity has been closely considered.

1.79. The ecology of the following qualifying bird species was assessed: Whooper Swan (*Cygnus cygnus*), Golden Plover (*Pluvialis apricaria*) and Lapwing (*Vanellus vanellus*). The SPA has also been designated for wetland habitats; however, while there are wetland habitats outside of the site boundary, the Application Site does not contain any wetland habitats and as such is considered unlikely that the above-named qualifying bird species will utilise the Application Site. None of these qualifying species were identified during the Wintering Bird Surveys (see Appendix B) conducted on site. Therefore it is considered extremely unlikely for these bird species to utilise the site. While some of them are known to frequent grassland habitat, at worst they will be subject to short term habitat displacement during construction. The surrounds of the Application Site mainly comprise of agricultural land, thus providing ample amount of suitable habitat for these species to be displaced to. In addition, these qualifying bird species' core foraging ranges were assessed. Research indicates that these species core foraging ranges are less than 5km[18][19][20], as the SPA is 9.17km southeast of the Application Site and provides richer feeding areas, potential for significant adverse effects are considered unlikely on these three qualifying species of bird as a result of the Amended Development.

1.80. Wigeon (*Anas Penelope),* Corncrake (*Crex crex*), Black-headed Gull *(Chroicocephalus ridibundus)* and Black-tailed Godwit *(Limosa limosa)* are the remaining qualifying features that need to be assessed. No scientific literature disclosing its core foraging range was found for any of these species.

[18]Scottish Natural Heritage. Assessing Connectivity with Special Protection Areas (SPAs). Available at: file:///C:/Users/User/Downloads/Assessing%20connectivity%20with%20special%20protection%20areas%20(4).pdf

[19] Spatial distribution of breeding meadow birds – implications for conservation and research. Available at: https://www.cr-reading.nl/V4/infopages/WaderStudyGroupPublication.pdf

[20] Managing grassland for wild geese in Britain: a review. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0006320798001347?via%3Dihub

1.81. The ideal habitat for Wigeon is wetland habitat that is surrounded by sparse open forest, woodland and especially agricultural land[21][22]. When considering that the site is not immediately surrounding the wetland habitat of the SPA and the SPA provides a more suitable and richer feeding grounds for Wigeon, it has been concluded that Wigeon are unlikely to use the Application Site, therefore, there is **no potential for significant adverse effects** on this species as a result of the Amended Development.

1.82. The habitat preferences of Corncrake (*Crex crex*), Black-headed Gull *(Chroicocephalus ridibundus)* and Black-tailed Godwit *(Limosa limosa)* was assessed.

1.83. Information gathered from birdwatchireland.ie indicates that Black-tailed Godwit *(Limosa limosa)* primarily reside around wetland habitats[23]. Considering that the SPA is a significant distance from the development area and that the Application Site does not contain wetland habitats, it is unlikely that Black-tailed Godwit *(Limosa limosa)* will use the terrain within the Application Site. It can be concluded that there is **no potential for significant adverse effects** on Black-tailed Godwit *(Limosa limosa)* as a result of the Amended Development.

1.84. Black-headed gulls' nest in wetland habitats, but are not confined to wetlands, and will forage in domestic waste and fields of crop. There is no food waste or crop associated with the Application Site, therefore, there is no potential for gull species to scavenge within the site boundary.

1.85. Corncrake are known to frequent in grassland habitats managed for the production of hay[24]. Corncrake are known to frequent in habitats with vegetation height of 30cm to 2m[25] as it provides coverage from predators and areas for breeding. The improved agricultural grassland on the site has been grazed too short to provide viable vegetation cover for Corncrake, therefore there is not significant risk of disruption.

1.86. There was no evidence of qualifying bird species of the Middle Shannon Callows SPA present within the Application Site during the time of the Wintering Bird Surveys (see **Appendix B**). Therefore, there is no evidence to suggest that the habitats within the Application Site support significant numbers of qualifying species for Middle Shannon Callows SPA.

1.87. No significant loss of suitable habitat (direct or indirect) is anticipated for these species through the construction of the Amended Development.

1.88. Given the level of suitable habitat within the wider landscape, it is considered that the potential noise disturbance from the construction and post-construction phases will not be significant for qualifying species associated with the SPA. It is considered that the Amended

[21] Kretchmar, A. V. 1994. Eurasian wigeon (*Anas penelope*) in north-eastern Asia. Zoologichesky Zhurnal 73(5): 68-79.

[22] MKear, J. 2005. Ducks, geese and swans volume 2: species accounts (Cairina to Mergus). Oxford University Press, Oxford, U.K.

[23] https://birdwatchireland.ie/ - accessed on 15/05/2023

[24] Barnes, K. N. 2000. The Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg. https://www.iucnredlist.org/ - accessed on 15/05/2023

[25] Taylor, B.; van Perlo, B. 1998. Rails: a guide to the rails, crakes, gallinules and coots of the world. Pica Press, Robertsbridge, UK. - https://www.iucnredlist.org/ - accessed on 15/05/2023

Development will **not result in significant adverse effects** for these qualifying bird species of the SPA.

1.89. The Middle Shannon Callows SPA is also designated for wetland habitat as a resource for the regularly-occurring migratory waterbirds, however no connectivity exists, therefore there is **no potential for significant adverse effects** on this qualifying habitat.

1.90. The Amended Development will **not result in significant adverse effects to the integrity** of the Middle Shannon Callows SPA

River Little Brosna Callows SPA

1.91. The River Little Brosna Callows SPA is designated for its importance for the following species:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Teal (*Anas crecca*) [A052]
- Pintail (*Anas acuta*) [A054]
- Shoveler (*Anas clypeata*) [A056]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

Conservation Objectives for River Little Brosna Callows SPA

1.92. There are two main conservation objectives[26] of the River Little Brosna Callows SPA. One is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. The second conservation objective is to maintain or restore the favourable conservation condition of the wetland habitat at River Little Brosna Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

[26] NPWS (2022) Conservation Objectives: River Suck Callows SPA 004077. Version 9.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Character of the Qualifying Interests of River Little Brosna Callows SPA

1.93. Table 1-8 below identifies the percentage of the extent of various habitat types within the SPA.

Table 1-8: Qualifying Habitats of the River Little Brosna Callows SPA and their extent within the site

Code	Qualifying Habitats	Extent and Character (%)
N06	Inland water bodies (Standing water, Running water)	10
N07	Bogs, Marshes, Water fringed vegetation, Fens	10
N10	Humid grassland, Mesophile grassland	50
N14	Improved grassland	30
Total Habitat Cover		100

Threats and Pressures on River Little Brosna Callows SPA

1.94. Table 1-9 lists the threats, pressures and activities impacting the River Little Brosna Callows SPA.

Table 1-9: Threats, pressures and activities impacting River Little Brosna Callows SPA

Code	Threats and Pressures	Rank	+/-	Inside/Outside
A03	Mowing / cutting of grassland	M	+/-	i
A04	Grazing	M	+/-	i
A08	Fertilisation	L	-	i
A08	Fertilisation	M	-	o
D01.01	Sylviculture, forestry	L	+/-	o
E01.03	Dispersed habitation	L	+/-	o
F02.03	Leisure fishing	L	+/-	i
F03.01	Hunting	M	-	i

Rank: H = High, M = Medium, L = Low, I = inside, O = outside, B = both, +/- = Positive/Negative Impact

Assessment of Likely Impacts Affecting the River Little Brosna Callows SPA

1.95. The River Little Brosna Callows SPA is located approximately 11.65km southeast of the Application Site and has been designated for a number of important bird species of the E.U. Habitats Directive, which are detailed within **Table 1-1** above.

1.96. The River Little Brosna Callows SPA stretches from its confluence with the River Shannon for c. 9km south-eastward and just past New Bridge located on the R438 road. The site comprises of areas of seasonally-flooded low-lying callow grassland and the river itself.

1.97. Given the Amended Development site's proximity to the SPA, and the qualifying bird species for which the SPA is designated, potential for ornithological connectivity has been closely considered.

1.98. The ecology of the following qualifying bird species was assessed: Whooper Swan (*Cygnus cygnus*), Golden Plover (*Pluvialis apricaria*), Pintail (Anas acuta), Lapwing (*Vanellus vanellus*), Greenland White-fronted Goose (*Anser albifrons flavirostris*). The SPA has also been designated for wetland habitats; however, the Application Site does not contain any wetland habitats and as such is considered unlikely that the above-named qualifying bird species will utilise the Application Site. Although it is considered unlikely for these bird species to utilise the site, some of them are known to frequent grassland habitat, and at worst, will be subject to short term habitat displacement during construction. None of these qualifying bird species have been identified as utilising the Application Site during the Wintering Bird Surveys (see **Appendix B**). The surrounding habitat of the Application Site is mainly comprised of agricultural land, thus providing ample suitable habitat for these species to be displaced to. In addition, these qualifying bird species' core foraging ranges were assessed. Research indicates that these species core foraging ranges are less than 5km[27][28][29], as the SPA is 11.65km southeast of the Application Site and provides richer feeding areas, **potential for significant adverse effects are considered unlikely** on these five qualifying species of bird as a result of the Amended Development.

1.99. The River Little Brosna Callows SPA is also designated for wetland habitat as a resource for the regularly-occurring migratory waterbirds, however no connectivity exists, therefore there is **no potential for significant adverse effects** on this qualifying habitat.

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[27] Scottish Natural Heritage. Assessing Connectivity with Special Protection Areas (SPAs). Available at: file:///C:/Users/User/Downloads/Assessing%20connectivity%20with%20special%20protection%20areas%20(4).pdf

[28] Spatial distribution of breeding meadow birds – implications for conservation and research. Available at: https://www.cr-reading.nl/V4/infopages/WaderStudyGroupPublication.pdf

[29] Managing grassland for wild geese in Britain: a review. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0006320798001347?via%3Dihub

[30] Spring Migration Ecology of Northern Pintails in South-Central Nebraska. Available at: https://bioone.org/journals/waterbirds/volume-34/issue-1/063.034.0102/Spring-Migration-Ecology-of-Northern-Pintails-in-South-Central-Nebraska/10.1675/063.034.0102.full#bibr34

1.100. Wigeon (*Anas Penelope),* Teal *(Anas crecca),* Shoveler *(Anas clypeata),* Black-tailed Godwit *(Limosa limosa) and* Black-headed Gull *(Chroicocephalus ridibundus)* are the remaining qualifying features that need to be assessed. No scientific literature disclosing core foraging range of each species was available at the time of creating this report. None of these qualifying bird species have been identified as utilising the Application Site during the Wintering Bird Surveys (see **Appendix B**).

1.101. The ideal habitat for Wigeon is wetland habitat that is surrounded by sparse open forest, woodland and especially agricultural land[3233]. Given the distance, lack of suitable habitat and lack of Wintering Bird Survey identifications (see **Appendix B**), there is **no potential for significant adverse effects** on this species as a result of the Amended Development.

1.102. The ecology of Teal *(Anas crecca),* Shoveler *(Anas clypeata),* Black-tailed Godwit *(Limosa limosa)* was assessed. Information gathered from birdwatchireland.ie indicates that these three species primarily reside around wetland habitats[34]. Considering that the SPA is a significant distance from the development area and that the Application Site does not contain wetland habitats and the lack of Wintering Bird Survey results (see **Appendix B**), it is unlikely that these species will use the terrain within the Application Site. Although it is considered unlikely for these bird species to utilise the site, some of them are known to frequent grassland habitat, and at worst, will be subject to short term habitat displacement during construction. The surrounds of the Application Site mainly comprise of agricultural land, thus providing similar habitat for these species to be displaced to. It can be concluded that **potential for significant adverse effects is considered unlikely** on these species as a result of the Amended Development.

1.103. Black-headed gulls' nest in wetland habitats, but are not confined to wetlands, and will forage in domestic waste and fields of crop. As there is there is no food waste or crop associated with Black-headed Gulls within the Application Site it is considered unlikely that gull species will scavenge within the site boundary, and therefore when combined with the lack of Wintering Bird Survey Results (see **Appendix B**), **there is no potential for significant effects** on this species of bird.

1.104. No significant loss of suitable habitat (direct or indirect) is anticipated for these species through the construction of the Amended Development.

1.105. Given the level of suitable habitat within the wider landscape, it is considered that the potential noise disturbance from the construction and post-construction phases will not be significant for qualifying species associated with the SPA. It is considered that the Amended Development will **not result in significant adverse effects** for these qualifying bird species of the SPA.

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[32] Kretchmar, A. V. 1994. Eurasian wigeon (*Anas penelope*) in north-eastern Asia. Zoologichesky Zhurnal 73(5): 68-79.

[33] MKear, J. 2005. Ducks, geese and swans volume 2: species accounts (Cairina to Mergus). Oxford University Press, Oxford, U.K.

[34] https://birdwatchireland.ie/ - accessed on 15/05/2023

1.106. The Amended Development will **not result in significant adverse effects to the integrity** of the River Little Brosna Callows SPA.

River Shannon Callows SAC

1.107. The River Shannon Callows SAC is designated for its importance for the following Annex I habitats and Annex II species:

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

Character of the Qualifying Interests of the River Shannon Callows SAC

1.108. **Table 1-10** below identifies the percentage of the extent of various habitat types within the SAC.

Table 1-10: Qualifying Habitats of the River Shannon Callows SAC and their extent within the site

Code	Qualifying Habitats	Extent and Character (%)
N06	Inland water bodies (Standing water, Running water)	13
N07	Bogs, Marshes, Water fringed vegetation, Fens	3
N09	Dry grassland, Steppes	1
N10	Humid grassland, Mesophile grassland	80
N14	Improved grassland	1
N16	Broad-leaved deciduous woodland	1
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	1

Total Habitat Cover	100

Threats and Pressures on the River Shannon Callows SAC

1.67. Table 1-11 lists the threats, pressures and activities impacting River Shannon Callows SAC.

Table 1-11: Threats, pressures and activities impacting the River Shannon Callows SAC

Code	Threats and Pressures	Rank	+/-	Inside/Outside
A03	Mowing / cutting of grassland	H	+	i
A03.03	Abandonment / lack of mowing	H	-	i
A04.01	Intensive grazing	M	-	i
A04.02.05	Non intensive mixed animal grazing	L	-	i
A04.03	Abandonment of pastoral systems, lack of grazing	H	-	i
A07	Use of biocides, hormones and chemicals	H	-	i
A08	Fertilisation	M	-	i
A10.01	Removal of hedges and copses or scrub	L	-	i
B02.02	Forestry clearance	M	-	i
B06	Grazing in forests/ woodland	L	-	i
C01.03.02	Mechanical removal of peat	L	-	i
D01.01	Paths, tracks, cycling tracks	L	-	i
F03.01	Hunting	L	-	b
G01	Outdoor sports and leisure activities, recreational activities	L	-	i
G05.01	Trampling, overuse	L	-	i
J02.01	Landfill, land reclamation and drying out, general	L	-	i
J02.04.01	Flooding	H	-	i

J02.05	Modification of hydrographic functioning, general	L	+/-	i
J02.05.02	Modifying structures of inland water courses	M	-	i
J02.11	Siltation rate changes, dumping, depositing of dredged deposits	M	-	i
K03.04	Predation	M	-	b

Rank: H = High, M = Medium, L = Low, I = inside, O = outside, B = both, +/- = Positive/Negative Impact

Assessment of Likely Impacts Affecting the River Shannon Callows SAC

1.109. As outlined in **Table 1-1**, the River Shannon Callows SAC has ecological connectivity with the Application Site due to the qualifying mobile species, otter (*Lutra lutra*). All other qualifying features of habitat were assessed, and it was concluded that no connectivity exists.

1.110. There is no hydrological connection linking the Application Site to the SAC, and therefore there is no pathway for contamination of otter habitat within the SAC.

1.111. Given that the Application Site is ecologically connected with the SAC, there is potential for otter to utilise the aquatic habitats (drainage ditches and low land depositing rivers) and to use terrestrial habitats on site for commuting.

1.112. Each of the potential contaminants outlined in **Table 1-2** above have been considered and assessed for their potential occurrence during the phases of the Amended Development. Potential contaminants are capable of undermining water quality and the conservation objectives for the qualifying species of otter.

1.113. It has been deduced that Otter has the potential to utilise the habitats within the site. During the habitat survey, the site was checked for signs of protected or notable species. No holts and/or resting places, or any other field signs of otter were identified during the Fossitt habitat survey. However, given the proximity of the Application Site to the River Shannon Callows SAC, the presence of suitable habitat for otter, and the fact that otter are a highly mobile species, the use of the Application Site by otter cannot be ruled out. Integral design measures include 2m buffer around all field drains and a 10m buffer around the ADS watercourses to reduce the potential for contaminants from the Application Site to enter the aquatic system.

1.114. There is potential for habitats within the Application Site that support otter, and there is a possibility for these habitats to be degraded if they were subjected to contamination. An **Outline Construction Environmental Management Plan (OCEMP)** has been produced in support of the consented application 24/61749 (please see **Technical Appendix 8; Volume 3**

of the consented application 24/61749), and this report outlines design and best practice measures for protecting the local environment, including terrestrial and aquatic habitats.

1.115. Measures have been included within the Amended Development Design to prevent pollution entering the aquatic environment. These are outlined below:

- Silt/Bentonite
    - During the construction and decommissioning phase, ground disturbance is limited to the Application Site. As part of the Amended Development design, Sustainable Drainage Systems (SuDS) will be implemented to control surface water movement and prevent silt/bentonite entering the aquatic environment. These have been incorporated into the design of the Amended Development and are required due to relevant regional drainage policies in light of the objectives of the Water Framework Directive and associated water quality Directives and Regulations.
    - This includes the use of silt traps at drainage ditches throughout the site.
- Cement or concrete wash water
    - Best practice pollution prevention measures will be followed during the use of these materials during the construction phase, which will ensure cement/concrete wash water does not enter the aquatic environment.
- Detergent
    - This material will not be used within the Application Site.
- Hydrocarbons (e.g. oil, diesel)
    - During the construction phase, all work will be undertaken following best practice pollution prevention measures, which include suitable storage of oil/fuels and correct refuelling processes. This will prevent hydrocarbons entering the aquatic system.
- Sewage
    - The only potential sewage produced within the Application Site will be from the welfare facilities provided for staff during the construction

phase. These facilities shall include an appropriate storage facility for sewage, which shall be collected regularly by a licensed waste contractor. Therefore, sewage will not enter the local environment, including aquatic habitats.

1.116. Further details on the drainage arrangements and waste management during the construction phase are outlined in the **Mitigation Measures** section below.

1.117. Despite the presence of these design and best practice measures, there is potential that the Amended Development will significantly affect the integrity of the River Shannon Callows SAC due to the potential for otter to be present within the Application Site.

1.118. Otter is a highly mobile mammal with large territories between 2km and 20km, using watercourses and ditches to commute to suitable foraging areas. Although no otter or field signs of otter were identified within the Ecological Survey Area (ESA) it is recommended that a pre-commencement otter survey is carried out as a precautionary measure.

1.119. As part of the Amended Development design, security fencing is to have mammal gates or 10cm gaps to allow free movement of otter through the site. All excavations during the construction phase of the Amended Development will be securely covered. Where this is not possible, a means of escape (for example a ramp) and daily checks must be included to allow safe exit from the excavation. This will therefore prevent the accidental trapping of this species.

1.120. It is considered that due to the adopted design principles, best practice and mitigation measures the Amended Development **will not result in significant adverse effects** for otter.

1.121. With the implementation of best practice and design measures, the Amended Development **will not result in significant adverse effects** to the integrity of the River Shannon Callows SAC.

Lough Derg (Shannon) SPA

1.122. The Lough Derg (Shannon) SPA is designated for its importance for the following Annex I habitats and Annex II species:

- Cormorant (*Phalacrocorax carbo*) [A017]
- Tufted Duck (*Aythya fuligula*) [A061]
- Goldeneye (*Bucephala clangula*) [A067]
- Common Tern (*Sterna hirundo*) [A193]
- Wetland and Waterbirds [A999]

Conservation Objectives for Lough Derg (Shannon) SPA

1.123. There are two main conservation objectives[35] of Lough Derg (Shannon) SPA. One is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. The second conservation objective is to maintain or restore the favourable conservation condition of the wetland habitat at Lough Derg (Shannon) SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

Character of the Qualifying Interests of Lough Derg (Shannon) SPA

1.124. **Table 1-12** below identifies the percentage of the extent of various habitat types within the SPA.

Table 1-12: Qualifying Habitats of the River Little Brosna Callows SPA and their extent within the site

Code	Qualifying Habitats	Extent and Character (%)
N09	Inland water bodies (Standing water, Running water)	1
N07	Bogs, Marshes, Water fringed vegetation, Fens	2
N10	Humid grassland, Mesophile grassland	1
N19	Improved grassland	1
N06	Dry grassland, Steppes	95
Total Habitat Cover		100

Threats and Pressures on Lough Derg (Shannon) SPA

1.125. **Table 1-13** lists the threats, pressures and activities impacting the River Little Brosna Callows SPA.

Table 1-13: Threats, pressures and activities impacting Lough Derg (Shannon SPA)

Code	Threats and Pressures	Rank	+/-	Inside/Outside
G01.01	Nautical sports	H	+/-	i
A08	Fertilisation	H	-	o
F02.03	Leisure fishing	L	+/-	i
F03.01	Hunting	M	-	i

[35] NPWS (2022) Conservation Objectives: Lough Derg (Shannon) SPA [004058]. Version 9.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Rank: H = High, M = Medium, L = Low, I = inside, O = outside, B = both, +/- = Positive/Negative Impact

Assessment of Likely Impacts Affecting the Lough Derg (Shannon) SPA

1.126. The Lough Derg (Shannon) SPA is located approximately 14.14km South of the Application Site and has been designated for a number of important bird species of the E.U. Habitats Directive, which are detailed within **Table 1-1** above.

1.127. Lough Derg lies within counties Tipperary, Galway and Clare and is the largest of the River Shannon Lakes, being some 40 km long. The site comprises of areas of seasonally-flooded low-lying callow grassland and the river itself. The shoreline is often fringed with swamp vegetation.

1.128. Given the Amended Development site's proximity to the SPA, and the qualifying bird species for which the SPA is designated, potential for ornithological connectivity has been closely considered. Wintering Bird Surveys were completed within the Amended Development Site, as such, **Wintering Bird Report, Appendix B** of this report should be read in conjunction with the NIS when assessing the Amended Developments potential for impact on designated bird species of the nearby Internationally Designated Sites.

1.129. Lough Derg is important for qualifying breeding and wintering birds, supporting nationally important breeding colonies of the Common Tern (*Sterna hirundo)*, Cormorant *(Phalacrocorax carbo),* and Tufted Duck (*Aythya fuligula)*. Lough Derg is of importance for both breeding and wintering birds.

1.130. In winter, the lake is important for a range of waterfowl species, including nationally important populations of tufted duck and goldeneye other species which occur in winter include mute swan (*Cygnus olor*), whooper swan (*Cygnus cygnus*), wigeon (*Anas penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos)*, little grebe (*Tachybaptus ruficollis)*, cormorant *(Phalacrocorax carbo)*, coot (*Fulica atra*), lapwing (*Vanellus vanellus)*, curlew and black-headed gull (*Chroicocephalus ridibundus).* None of these species were identified during the wintering bird surveys conducted on site (**Appendix B**).

1.131. No significant loss of suitable habitat (direct or indirect) is anticipated for these species through the construction of the Amended Development.

1.132. Given the level of suitable habitat within the wider landscape, it is considered that the potential noise disturbance from the construction and post-construction phases will not be significant for qualifying species associated with the SPA. It is considered that the Amended Development will **not result in significant adverse effects** for these qualifying bird species of the SPA.

1.133. Hydrological connectivity exists as there is a hydrological pathway from the Proposed Development is via the Ardultagh stream 1st order stream (IE_SH_25K010060) that intersects the site which flows in to the Kilcrow 25 4th & 5TH order river waterbodies (respectively: IE_SH_25K010100 & IE_SH_25K010700) which flow into the SPA. The cumulative hydrological pathway is c. 26.85km.

1.134. The qualifying feature, Wetland and Waterbirds [A999] is aquatic in nature and is therefore hydrologically connected.

1.135. In the absence of mitigation, this aquatic habitat may be significantly impacted as a result of aquatic contamination via hydrological connections described above.

1.136. Pollution can result from any of the following entering a body of surface or groundwater:

- Poisonous, noxious or polluting matter
- Waste matter (including silt, cement, concrete, oil, petroleum spirit, chemicals, solvents, sewage and other polluting matter).
- Other harmful activities detrimentally affecting the status of the waterbody.

1.137. The status of a waterbody can be affected not only by chemical pollution, but also by activities directly or indirectly affecting ecology, including changes in physio-chemical parameters such as temperature, pH and turbidity or physical modification to the hydrology of a waterbody.

1.138. For more detail on common water pollutants and their effect on the environment, see **Table 1-2** above.

1.139. The Ardultagh stream 1st order stream (IE_SH_25K010060) that intersects the site may be subject to aquatic contamination and as a result, may cause significant impacts may occur to the qualifying feature - Wetland and Waterbirds [A999] of the SPA in the absence of mitigation.

1.140. 10m avoidance buffer along the Ardultagh stream 1st order stream has been incorporated into the design.

1.141. A **Construction Environmental Management Plan (CEMP)** has been produced in support of this application (please see accompanying CEMP[36]), and this report outlines design and best practice measures for protecting the local environment.

1.142. Measures have been included within the Proposed Development Design to prevent pollution entering the aquatic environment. These are outlined below:

- Cement based pollutants
    - Best practice pollution prevention measures will be followed during the use of these materials during the construction phase, which will ensure cement/concrete wash water does not enter the aquatic environment.
- Avoiding Chemical/Fuel Spillages to Ground

[36] Neo Environmental Ltd (2024) Construction Environmental Management Plan. Proposed Nenagh Solar Farm.

- All precautions will be taken to avoid spillages of diesel, oil or other polluting substances during the construction phase.

- Training in Pollution Prevention Measures
  - All site staff (including subcontractors) will be briefed on the contents of the CEMP. A large focus of this training will relate to the required pollution prevention measures to protect surface water.

1.143. Further details on the drainage arrangements and waste management during the construction phase are outlined in the **Mitigation Measures** section below.

1.144. In addition, an avoidance buffers of 2m from all drainage ditches have been incorporated into the Proposed Development's design.

1.145. It's considered that with the implementation of best practice, design and mitigation measures the Proposed Development will **not result in significant adverse effects** for the aquatic habitat, Wetland and Waterbirds [A999]:

1.146. The Amended Development will **not result in significant adverse effects to the integrity** of the Lough Derg (Shannon SPA).

Summary of Potential Impacts on European Designated Sites within 15km

1.147. From the findings of the above assessment, it is considered that the Amended Development will not adversely affect the integrity of the European Designated sites within the study area. This is relevant for the construction, operation and decommissioning stages.

Design, Best Practice and Mitigation Measures

1.148. Mitigation measures have been outlined to limit potential impacts for the qualifying features of European Designated sites. These are outlined in Table 1-14:

Table -2-14: Design, best practice and mitigation measures

Feature	Potential Impact	Phase of Development	Measures implemented
Integral design Measures			
Aquatic environment	Pollution	Construction	2m Buffer from field drains and 10m Arterial Drainage Scheme watercourse buffer.
Otter	Exclusion from foraging habitat	Construction	Security fencing to have mammal gates or a 10cm gap at base to allow free movement of otter through the site.
Standard Best Practice Measures			
Aquatic environment	Pollution	Construction	Best practice pollution prevention measures implemented prior to and throughout the construction phase to prevent contaminants entering the aquatic environment (outlined below). Best practice biosecurity measures to be implemented throughout the construction phase.
Otter	Accidental trapping within excavations	Construction	All excavations should be securely covered, or a suitable means of escape provided at the end of each working day.
Mitigation Measures			

Otter	Disturbance	Pre-construction	Pre-commencement survey (Measures dependant on survey findings).

1.149. The measures outlined above will implemented prior to or during the construction phase of the development. The pre-construction otter survey must be undertaken within 48 hours of construction start. Otter surveys can be carried out at any time of year but should be avoided following periods of prolonged heavy rainfall when spraints and other signs of otter may be washed away.

Pollution Prevention

1.150. Suitable protection for watercourses potentially affected by the works will be installed prior to relevant works proceeding. These measures will be in-line with Environmental Protection Agency (EPA) Pollution Prevention Guidelines. Protection measures will include:

- Plant and equipment will be stored on dedicated hardstandings within the construction compound (Part of the Consented Development). This will minimise the risk of pollution caused by leakages occurring out of hours. Drip trays will be used where appropriate;
- All plant and equipment will utilise biodegradable hydraulic oil;
- Spill kits will be readily available to all personnel. The spill kits will be of an appropriate size and type for the materials held on site;
- Diesel fuel will be stored in a bunded diesel bowser which will be located within a fenced off area in the construction compound;
- Refuelling and maintenance of vehicles and plant will take place in designated areas of hardstanding;
- All other chemicals will be stored within a storage contained with an accompanying COSHH Datasheet;
- Wastewater from the temporary staff toilets and washing facilities will be discharged to sealed containment systems and disposed via licensed contractors; and

- Early seeding of embankments near watercourses will be undertaken to reduce the potential for sediment run-off.

1.151. All staff on site will be made aware of the pollution prevention measures being implemented throughout the construction and decommissioning phases using appropriate toolbox talks and the site induction.

Drainage Management Plan

1.152. The measures described in this section will be adopted during the construction phase in order to manage on-site drainage in accordance with current best practice and legislation.

Monitoring Records and Emergency Spill Response

Monitoring

1.153. To ensure compliance with the detailed Drainage Management Plan ("DMP"), drainage management works will be supervised by the site engineer.

Emergency Spill or Pollution Response

1.154. In the event of a liquid spill occurring on a construction site, the Contractor shall cease work immediately in the vicinity. Contractor's trained personnel shall do an appropriate PPE and as follows:

- Locate the source of the pollution and stop/contain any further flow if possible;
- If spillage is flammable, extinguish all ignition sources;
- Immediately deploy the spill kit in accordance with the manufacturer's instructions;
- Clean up the spill; and
- All used spill kit materials should be disposed of in the proper manner as outlined in spill summary procedures.

1.155. The Site Manager shall contact:

- The Client;
- Environmental Protection Agency ("EPA") 24-hour emergency incident line 1890 33 55 99; and

- Inland Fisheries 24-hour pollution line 1890 34 74 24. The pollution hotline number shall be referenced in the construction site rules and displayed in the Site Office and in the Emergency preparedness & response plan.

1.156. Each Contractor working with controlled substances shall supply appropriate spill kits which shall be kept on site. The spill kits shall be made accessible at all times to all site personnel.

1.157. In the event of a fire, all personnel must evacuate the site and assemble at the site entrance. The Site Manager is responsible for calling the Fire Service, who will handle the emergency.

Operational Drainage Arrangements

1.158. An integral part of the Amended Development design involves methods for controlling the movement of surface water within the Application Site. Movement of surface water will be managed by a Sustainable Drainage System (SuDS) following best practice guidelines on the use of SuDS[37].

1.159. The consented drainage strategy (see **Technical Appendix 4: Flood Risk and Drainage Impact Assessment; Volume 3** of Planning application: 24/61749 for further details) to construct multiple filter drains/soakaways/channels and within the A Site. The locations of the schemes have been chosen on the downward slope or near to existing watercourses or drainage features

1.160. The proposed soakaways/channels will provide a total storage greater than the volume of additional runoff generated as a result of the impermeable buildings. It is therefore considered that this adequately mitigates the increase in flow rates as a result of the minor increase in impermeable area and provides improvement.

1.161. These measures will **significantly reduce the potential** for contaminated surface waters entering the aquatic environment.

1.162. The layout of the channels is indicated within **Figure 4.4**, **Appendix 4A** of **Technical Appendix 4 within the consented planning application : 24/61749.**.

Additional Drainage Measures

1.163. Additional drainage measures to be implemented on-site include the following:

- Solar Panels: current grass cover is to be retained or reinstated adjacent to and under panels in order to maximise bio-retention;
- Access Tracks: access tracks are to be unpaved and constructed from local stone. Temporary swales or similar shall be utilised to collect runoff from access tracks with

[37] Ciria (2007) The SuDS Manual. Available at: https://www.ciria.org/

discharge to ground through percolation areas. Where swales are utilised, frequent checks of dams formed from gravels and other excavated material should be undertaken; and

- Transformers: the scale of these types of structures is unlikely to warrant a formalised drainage system. Runoff from this infrastructure and any associated hard standing should be directed to a percolation area for discharge to ground. Should surface water accumulate around any of these locations then a simple soakaway can be constructed to allow water soak into the underlying subsoils.

Construction Phase Drainage Arrangements

1.164. Due to the addition of the temporary construction compound during the construction phase, additional drainage measures will be implemented to help attenuate the increase in surface water flows, from the construction compound.

1.165. Runoff from these areas is anticipated to potentially have high silt loading due to mobilised soils from excavated surfaces, fines from track aggregate and sludge due to traffic.

1.166. Hardstanding runoff will be directed to a swale on the construction compound's lowest boundary. This drainage scheme will be removed at the end of the construction stage and the area reinstated.

Drainage Mitigation

Clean Water Diversion

1.167. Where feasible, clean water (e.g. water that has yet to come into contact with any disturbed construction or working areas), will be kept separate from the watershed or intercepted by the solar farm construction drainage.

1.168. Up-gradient cut-off ditches and water diversion measures will be installed in order to intercept and divert clean water around the construction compound area. These measures will be installed ahead of the main construction works. This will reduce or prevent the amount of potential silt-laden or polluted water that might require treatment.

1.169. Clean runoff that has been diverted around an area of working should be discharged into an area of vegetation for dispersion or infiltration, in accordance with SuDS techniques.

1.170. Sediment control measures, such as silt traps, gravel, sand bags, anchored straw bales or silt fencing might be required at the discharge point to prevent erosion at the outlet and aid dispersion of the diverted water.

Silt Control

1.171. Silt-laden runoff should be expected from any areas of recently exposed soil or rock. There is also potential for pollution to occur from machinery used in the solar farm construction.

1.172. Any introduced or artificial materials required (e.g. silt fencing, straw bales, sand bags etc.) that might need to be deployed onsite, will be removed on completion of the works.

1.173. Discharge from the silt control measures will be discharged into an area of vegetation for dispersion or infiltration, in accordance with SuDS techniques or discharged into the existing drainage network within the Application Site.

CONSIDERATION OF CUMULATIVE EFFECTS

1.174. As well as singular effects, cumulative effects also need to be considered. Article 6 of the EU Habitats Directive and Regulation 15 of the European Communities (Natural Habitats) Regulations state that any plan or project that may, either alone or in combination with other plans or projects, significantly affects a European Designated site, should be the subject of an AA.

1.175. Cumulative impacts can be an issue when proposals have a small impact on European Designated sites. If other proposals have a small impact, the combined result can have a significant impact on the European Designated site.

1.176. The European Commission Habitats Directive and the Habitats Regulations 2011 require that the impacts on European sites be assessed from the plan or project in question and also in the presence of other plans and projects that could affect the same European Designated sites.

1.177. This Stage 2 AA screening has identified other plans and projects that could act in combination with the Amended Development and its associated future elements, to identify if they pose likely significant effects on European sites.

1.178. It concludes that if these other Plans and Projects have undergone an AA themselves and have either been adopted or consented following an AA then it cannot pose likely significant adverse effects on European sites.

Plans

National Planning Framework 2040

1.179. The National Planning Framework (NPF) 2040 is a high-level, national vision and provides the strategic framework and principles to manage future population and economic growth in Ireland over the next 20 years. It informs the parameters for the preparation of Regional Spatial and Economic Strategies (RSESs) by each of the three Regional Assemblies, established under the Local Government Reform Act 2014.

1.180. In order to comply with the requirements of Article 6(3) of the EU Habitats Directive an AA screening was undertaken at an early stage in the drafting of the National Planning Framework (NPF).

1.181. Adopting the precautionary principle, it was concluded that a NIS should be prepared. An NIS was prepared by RPS on behalf of the Minister for Housing, Planning and Local Government. The NIS considered the potential for the NPF to adversely affect the integrity of any European Designated site(s); with regard to their qualifying interests, associated conservation status,

the structure/function of the site(s) and the overall site(s) integrity. This was done in a two-stage process, initially assessing the draft NPF and subsequently assessing the changes made post consultation for the NPF.

1.182. The Minster of Housing, Planning and Local Government, having considered the AA and its conclusions determined that;

"The adoption and publication of the NPF as a replacement of the National Spatial Strategy for the purposes of section 2 of the Planning Development Act 2000 will not individually or in combination with any other plan or project adversely affect the integrity of any European Site (as defined)."

1.183. Thus, the in-combination impacts from the NPF, with the Amended Development are **not predicted to result in any Likely Significant Effects** to any European site(s).

Regional Spatial and Economic Strategy for the Northern and Western Regional Assembly

1.184. In order to comply with the requirements of Article 6 (3) of the EU Habitats Directive and Part XAB of the Planning and Development Act 2000 (as amended), the process of Screening for Appropriate Assessment (AA) was undertaken at an early stage in the drafting of the Regional Spatial and Economic Strategy (RSES).

1.185. The AA Screening undertaken by ecologists at RPS on behalf of the Northern and Western Regional Assembly, assessed whether the RSES was likely to have significant effects on any European Sites within the European Designations network, either alone or in combination with other plans and projects.

1.186. The screening concluded that an Appropriate Assessment of the RSES was required, as the Plan is not directly connected with or necessary to the management of the sites as European sites and as it cannot be excluded, on the basis of objective information, that the Plan, individually or in combination with other plans or projects, would have a significant effect on a European site.

1.187. Therefore, adopting the precautionary principle, it was concluded that a NIR should be prepared. The NIR (prepared by RPS on behalf of the Northern and Western Regional Assembly) considered the potential for the Regional Spatial and Economic Strategy to adversely affect the integrity of any European Designated site(s), with regard to their qualifying interests, associated conservation status, the structure/function of the site(s) and the overall site(s) integrity.

1.188. The Assembly determined that pursuant to Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act 2000-2018, that the adoption and publication of the RSES as a replacement for the "Regional Planning Guidelines" for the purposes of Section 24 (4) of the Planning and Development Act 2000 (as amended) would not either individually or in combination with any other plan or project adversely affect the integrity of any European Site.

Galway County Development Plan 2022-2028

1.189. In accordance with European and National legislation, the Council carried out an AA under the Habitats Directive, which informed the preparation of the Galway County Development Plan. The Stage 2 AA NIR was also use to inform the preparation of the Draft Galway County Development Plan 2022-2028.

1.190. It concluded that with the incorporation of mitigation measures, the Plan is **not foreseen to give rise to any significant effects** on designated European sites, alone or in combination with other plans or projects.

Projects

1.191. There is no standard prescriptive method for assessing cumulative and combined effects of planning applications within a given area. Planning applications considered within this cumulative assessment have been screened by distance, scale and nature, and further determined by comparing potentially overlapping zones of influence from other in regards to species, habitats and designated sites.

1.192. There are numerous applications and developments within the 5km buffer. The vast majority of these relate to residential developments (chiefly improvements to dwellings and housing extensions). Given the small scale of these residential projects and a lack of connectivity and impacts to designated sites, it is not reasonably likely that any of these would result in significant cumulative effects on designated sites.

1.193. The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change[38] When considering cumulative effects, the detail to which the effects of other developments can be assessed quantitatively is dependent on the level of information available. Where environmental assessment information regarding other developments is not available, data deficient or uncertain, the assessment and screening of planning applications is conducted is on a qualitative level.

1.194. In specific regard to this cumulative impact assessment, following relevant guidance a zone of influence/cumulative impact assessment radius of 5km from the Amended Development's boundary has been established.

1.195. A search of the Galway County Council online planning portal revealed that currently only one other solar farm is within the 5km buffer zone. **Table 1-15** covers these similarly sized developments within a 5km study area of the Application Site.

Table 1-15: Developments within 5km of the Amended Development

[38]CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2 Available at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf

Planning Reference	Project Type	Distance and Direction	Planning Status
151487	Expansion of an existing 30m high antenna support structure (previously granted permission under reference 09/1468 & An Bord Pleanala ref PL 07.235071 which was a temporary permission for a period of 5 years which has expired) carrying antennas and transmission dishes.	1.4km West	Application Finalised Conditional
19775	Reconstruction of a prefabricated building providing afterschool facility approved under planning reference no. 171855 at Lawrencetown National School to a permanent single storey building with revised building layout, septic tank, connection to all essential	4.5km North East	Application Finalised Conditional
2360827	Development of a 240MWh battery energy storage systems facility within a total site area of up to 3.02 hectares, the site will include 1no. 38KV substation compound including 1no. single storey electrical substation building with an area of 69 hectares	2.5km North East	Application Finalised Conditional
2361049	A planning application for a development that will last for a period of 10 years to construct & complete a Solar PV Energy development with a total site area of circa 81.9 hectares, to include, solar PV panels ground mounted on support structures,	0.0km	Application Finalised Conditional

1.196. The majority of planning applications within the area of the Application Site are small residential or agricultural developments. These have been screened out due to a lack of hydrological, ornithological and ecological connectivity, along with their overall small scale.

1.197. Planning Application **151487** is for retention of an existing 30m high antenna support structure, carrying transmission dishes, antenna, security fencing and an access track. Requirement for Appropriate Assessment has been screened out for this Amended Development having regard to the scale and nature of the proposal and the lack of any physical or hydrological connection between the development site and any European Site. Therefore, it is considered that this development in combination with other Developments in the wider area, will have **no likely significant cumulative effects.**

1.198. Planning Application **19775** is for reconstruction of a prefabricated building into a single-story building with an attached septic tank. Requirement for Appropriate Assessment has been

screened out for this Amended Development having regard to the scale and nature of the proposal and the lack of any physical or hydrological connection between the development site and any European Site. Therefore, it is considered that this development in combination with other Developments in the wider area, will have **no likely significant cumulative effects**.

1.199. Planning Application **2360827** is for a proposed Battery energy storage system facility and a single-story substation cover 3.09ha, and 61ha respectively. Requirement for Appropriate Assessment has been screened out for this Amended Development having regard to the scale and nature of the proposal and the lack of any physical or hydrological connection between the development site and any European Site. Therefore, it is considered that this development in combination with other Developments in the wider area, will have **no likely significant cumulative effects**.

1.200. Planning Application **2361049** is for a proposed solar PV panel array consisting of no. solar PV panels on ground mounted steel frames on a c. 81.9-hectare site. Limited hydrological connection exists between this application and the River Shannon Callows SPA and ornithological connectivity exists between River Little Brosna Callows SPA and Middle Shannon Callows SPA. No connectivity exists between the other European designated sites, within 15km of the planned development. It was concluded that with the implementation of integral design measures, mitigation and best practice construction methods, this development will not have a significant effect upon any qualifying features, and therefore the integrity, of any European Designated sites connected with the Application Site. An amendment application of this solar farm will also be submitted, and an updated NIS has been produced by Neo Environmental. The proposed changes are minor, and will not alter the conclusions of the NIS for the original proposed solar farm application. Therefore, it is considered that this development in combination with other Developments in the wider area, will have **no likely significant cumulative effects.**

1.201. To minimise the impact to European Designated sites, design measures have been incorporated such as 2m buffers on all drainage ditches, further bird survey efforts and best practice pollution reduction. Therefore, it is considered that this development in combination with other Amended Developments in the wider area, **will have no likely significant cumulative effects.**

1.202. With the implementation of mitigation and integral design measures during the construction and operation of the Amended Development and grid route, at worst the development will have a negligible effect upon any individual receptor. For the purposes of this this assessment, **it is therefore confirmed that no likely significant cumulative effects will occur upon any nearby environmental designated site, habitats or protected and Priority species.**

CONCLUSION

1.203. Within the 15km zone of influence (ZOI) surrounding the Application Site there are seven European Designated Sites. Four Special Protection Areas (SPAs); River Suck Callows SPA, Middle Shannon Callows SPA, River Little Brosna Callows SPA, and Lough Derg (Shannon) SPA. Six Special Areas of Conservation (SACs); Ardgraigue Bog SAC, Glenloughaun Esker SAC, River Shannon Callows SAC, Redwood Bog SAC, Lough Derg, North-east Shore SAC and Barroughter Bog SAC.

1.204. It has been concluded that there is potential for ecological connectivity between the Application Site and the River Shannon Callows SAC and limited hydrological connectivity exists from the Lough Derg, North-east Shore SAC (26.85km downriver), to the Application Site due to the Ardultagh stream that intersects the site. Additionally, there is potential for ornithological connectivity between the Application Site and the River Suck Callows SPA, River Little Brosna Callows SPA and Middle Shannon Callows SPA providing a pathway for potential impacts. There is limited hydrological connectivity between the Application Site and the Lough Derg (Shannon) SPA. The qualifying features of these six European Designated sites have been outlined and assessed in full in this report.

1.205. As no connectivity (pathway for impacts) exists between the Application Site and the remaining European designated sites within the study area, these have been 'scoped out' from further assessment.

1.206. To minimise potential impacts on European designated sites, design measures have been incorporated into the Amended Development as part of the iterative design process. These include 2m buffers from all drainage ditches.

1.207. Standard best practice pollution prevention measures for the construction stage have also been outlined and considered as part of the impact assessment stage.

1.208. Recommended survey work as part of the relevant mitigation measures has been provided within this report (**Table 1-14**).

1.209. With the implementation of these measures, along with ongoing monitoring to ensure compliance, it is considered that the Amended Development **will not have a significant effect upon any qualifying features, and therefore the integrity, of the European Designated sites** connected with the Application Site.

1.210. It is therefore considered that the next stage (Stage 3; Assessment of Alternatives) of the Appropriate Assessment is not required.

APPENDICES

Appendix A

- Figure 1– Designated Sites Map

Appendix B– Wintering Bird Survey Report

An **Origin Enterprises** Company

GLASGOW - HEAD OFFICE

Wright Business Centre, 1 Lonmay Road,
Glasgow, G33 4EL
T: 0141 773 6262

NORTHERN IRELAND OFFICE

83-85 Bridge Street, Ballymena, Co. Antrim,
Northern Ireland, BT43 5EN
T: 0282 565 04 13

BRISTOL OFFICE

Spaces 8th Floor
The Programme Building
The Pithay
Bristol, BS1 2NB
T: 0282 565 04 13

DUBLIN OFFICE

C/O Origin Enterprises PLC
4-6 Riverwalk,
Citywest Business Campus
Dublin 24, D24 DCW0
T: 00 353 (1) 5634900

RUGBY OFFICE

Valiant Office Suites
Lumonics House, Valley Drive,
Swift Valley, Rugby,
Warwickshire, CV21 1TQ
T: 01788 297012

WARRINGTON OFFICE

Lakeview 600, Lakeside Drive
Centre Park Square
Warrington
WA1 1RW
T: 01925 984 682