6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Development may have on Biodiversity, Flora and Fauna (with the exception of avian receptors, which are specifically dealt with in Chapter 7 of this EIAR) and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance, as well as any role they may play in providing a supporting network for European Sites and their QIs and SCIs. These include species and habitats with national and international protection under the Wildlife Acts 1976-2021 and the EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

The chapter is structured as follows:

- The Introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity, Flora and Fauna.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the development: construction phase, operational phase and decommissioning phase. Potential Cumulative effects in combination with other projects are fully assessed.
- Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity, Flora and Fauna.

The following bullet points define terms utilised in this chapter:

- Where the 'Proposed Development' is referred to, this relates to all the components comprising the Wind Farm Site and the Grid Connection, as described in detail in Chapter 4 of this EIAR.
- Where 'the Site' is referred to, this relates to the lands as delineated by the EIAR Site Boundary in green as shown on Figure 6-1, which comprises the primary 'survey area' for the Proposed Development.
- Where the 'Wind Farm Site' is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, junction accommodation works, access roads, temporary construction compound, underground cabling, spoil management, site drainage, tree felling and all ancillary works and apparatus.
- The 'Grid Connection' is referred to, this relates to the temporary construction compound and 110kV onsite substation, and associated underground 110kV cabling connecting to the existing Thornsberry 110kV substation.
- "Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the Proposed Development upon which likely significant effects are anticipated.

- "Zones of Influence" (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout

T1
T2
T3
T4
T5
T6
T7
T8
T9

Drawing Title	EIAR Site Boundary
Project Title	Umma More Renewable Energy Development
Drawn By: PE	Checked By: JH
Project No.: 201050	Drawing No.: Figure 6-1
Scale: 1:90000	Date: 2023-01-20

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6.3 Requirements for Ecological Impact Assessment

European Legislation

The EU Habitats Directive (92/43/EEC) (together with the Birds Directive (79/409/EEC), as subsequently codified by Council Directive 2009/147/EC on the conservation of wild birds) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Habitats Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and Birds Directive, which were transposed into Irish law inter alia through Part XAB of the Planning and Development Act 2000 (as amended) (from a land use planning perspective) recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats.

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

Council Directive 2009/147/EC on the conservation of wild birds (the "**Birds Directive**") instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

National Legislation

The Wildlife Act, 1976–2021, is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. The Appropriate Assessment ("AA) process, or screening for same, under Part XAB if the Planning Acts therefore does not apply to NHAs or pNHAs. pNHAs were published on a non-statutory

basis in 1995 but have not since been statutorily proposed or designated[1] However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under Flora Protection Order.it is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017) (the "**Plan**") demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations through a series of targeted strategies and actions. The main objective of the Plan is to bring biodiversity into the mainstream of policy and decision-making. Objective 1 (*Mainstream biodiversity into decision-making across all sectors*) of the Plan identifies the following relevant measures in relation to future developments:

- "Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation;
- Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans;
- All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure;
- Strengthen ecological expertise in local authorities and relevant Government Departments and agencies;
- Local Authorities will review and update their Biodiversity and Heritage Action Plans;
- Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity;
- Develop a Green Infrastructure at local, regional and national levels and promote the use of nature based solutions for the delivery of a coherent and integrated network;
- Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;
- Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP;
- Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making;
- Initiate natural capital accounting through sectoral and small scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA);
- Establish a national Business and Biodiversity Platform under the CBD's Global Business Partnership;
- Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity;

[1] https://www.npws.ie/protected-sites/nha (accessed 23 January 2020).

- Implement actions from Ireland's Biodiversity Climate Change Sectoral Adaptation Plan;
- Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity;
- Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration;
- Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and
- Monitor the implementation of the Plan."

Such policies have informed the evaluation of ecological features recorded within the EIAR Site Boundary and the ecological assessment process.

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Biodiversity Chapter. A detailed assessment of the likelihood of the Proposed Development having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs, SPAs or cSPAs) has been carried out in the Appropriate Assessment Screening Report and Natura Impact Statement (NIS). A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. As per EPA Guidance 2022, "a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement" but should "incorporate their key findings as available and appropriate". However, the relevant conclusions of the AA Screening Report and NIS have been cross-referenced and incorporated.

6.4 Scoping/Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
- Pollinator-friendly management of Wind Farms. All-Ireland Pollinator Plan, Guidelines 12. National Biodiversity Data Centre Series No. 26, Waterford. April 2021.

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of the EIAR.

In addition to the above, the following legislation applies with respect to habitats, fauna and water quality in Ireland and has been considered in the preparation of this report:

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)

- S.I. No. 327 of 2012 - European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2012; S.I. No. 386 of 2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015; S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC)
- Planning and Development Acts 2000 (as amended)

The following legislation applies with respect to non-native species:

- Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Westmeath County Development Plan 2021 – 2027.
- Offaly County Development Plan 2021 - 2027

6.4.1 Statement of Authority

Ecological baseline surveys including bat habitat assessment and activity surveys, were conducted by MKO ecologists; Patrick Ellison (B.Sc., M.Sc), Aoife Joyce (BSc., MSc.), Cathal Bergin (B.Sc), Laoise Kelly (BSc.), Rudraksh Gupta (BSc., MSc.), Cora Twomey (B.Sc), Brónagh Boylan (B.Sc), Luke Dodebier (BSc.), Rachel Walsh (BSc.), Katie Pender (BSc.) and Neil Campbell (BSc., MSc.). All surveyors have relevant academic qualifications and are competent experts in undertaking the habitat and ecological assessments.

The final Bat Report was prepared by Laura McEntegart under the supervision of Aoife Joyce, John Hynes (BSc., MSc.) and Pat Roberts (BSc., MCIEEM) who reviewed and approved the final document.

This EIAR chapter has been prepared by Patrick Ellison (B.Sc., M.Sc) and reviewed by John Hynes (B.Sc., M.Sc., MCIEEM). Patrick is an experienced ecologist with over 6 and a half years professional consultancy experience. John is a highly experienced ecologist who has over 10 years' professional experience in environmental management and ecological assessment.

6.5 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Development site and all lands within the EIAR Site Boundary. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

6.5.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- Inland Fisheries Ireland (IFI) Reports, where available.

- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes[2].
- Review of relevant Plans, including the National Biodiversity Action Plan 2017-2021, County Biodiversity Plan and the All Ireland Pollinator Plan 2021-2025.
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Development is located.
- Review of the EIS/ EIARs prepared for other plans and projects occurring in the wider area. Potential for in-combination effects have been considered in Chapter 2 of this EIAR and Section 6.8 of this Chapter.

6.5.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.6 of this EIAR.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-4 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1 provides a list of the organisations consulted with regard to biodiversity during the scoping process, and notes where scoping responses were received.

Table 6-1: Organisations consulted with regard to biodiversity

Consultee	Date of Response	Response Details
An Taisce	No Response	N/A
Bat Conservation Ireland	11/02/2022	Unfortunately, BCIreland is a small wildlife charity that does not have the capacity to comment on planning applications. Please ensure that bat surveys follow best practice guidelines which includes the following: › Collins, J. (Editor) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London. › Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland. › UNEP/EUROBATS: Guideline for consideration of bats in wind farm projects, Publication Series No. 3. › Natural England Technical Information Note TIN051: Bats and onshore wind turbines – Interim Report 2012 › Guide to Turbines and Wind Farms. Bat Conservation Ireland 2012.

[2] *NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e, Accessed: 15/04/2021.*

Consultee	Date of Response	Response Details
		› Bats and onshore wind turbines: Survey, Assessment and Mitigations. January 2019. › BCIreland also has a bat database that can be queried, for a fee.
Birdwatch Ireland	No Response	N/A
Butterfly Conservation Ireland	No Response	N/A
Department of Agriculture, Food and the Marine	No Response	N/A
Department of the Environment, Climate and Communications	No Response	N/A
Department of Culture, Heritage and the Gaeltacht	No Response	N/A
Inland Fisheries Ireland	No Response	N/A
Irish Red Grouse Association	No Response	N/A
Irish Raptor Study Group	No Response	N/A
Irish Water	No Response	N/A
Irish Wildlife Trust	14/02/2022	'*Thank you for contacting us. We do not have the staff capacity to respond to this consultation at the moment but will keep it on file.*'
NPWS	21/09/2021	**With regard to: EIAR; Ecological survey:** With regard to scoping for an EIAR for a proposed development, in order to assess impacts on biodiversity, fauna, flora and habitats an ecological survey should be carried out of the proposed development site including the route of any access roads, pipelines or cables etc. to survey the habitats and species present. Any improvement or reinforcement works required for access and transport anywhere along any proposed haul route(s) should be included in the EIAR and subjected to ecological impact assessment with the inclusion of mitigation measures, as appropriate. Where bridges require strengthening this may involve grouting of crevices which may function as bat roosts. Where ex-situ impacts are possible survey work may be required outside of the development sites. Such surveys should be carried out by suitably qualified persons at an appropriate time of the year depending on the species being surveyed for. The EIAR should include the results of the surveys and detail the survey methodology and timing of such surveys. It is expected by this Department that best practice will be adhered to with regard to survey methodology and if necessary non Irish methodology adapted for the Irish situation. The EIAR should cover the whole project, including construction, operation and, if

Consultee	Date of Response	Response Details
		applicable, restoration or decommissioning phases. Alternatives examined should also be included in the EIAR. Inland Fisheries Ireland should be consulted with regard to fish species if applicable. For information on Geological and Geomorphological sites the Geological Survey of Ireland should be consulted. Specific reference should be made to the National Biodiversity Action Plan, Regional Spatial and Economic Strategy and any relevant County Biodiversity Plan and or objectives. Any losses of biodiversity habitat associated with this proposed development (including access roads and cabling etc.) such as woodland, scrub, hedgerows and other habitats should be mitigated for with no net loss of biodiversity the outcome. In order to assess impacts it may be necessary to obtain hydrological and/or geological data. Any impact on water table levels or groundwater flows may impact on wetland sites some distance away (i.e., beyond the 15km radius). The EIAR should assess cumulative impacts with other plans or projects if applicable. Where negative impacts are identified suitable mitigation measures should be detailed as appropriate. **EIAR; Hedgerows and related species:** Hedgerows should be maintained where possible as they form wildlife corridors and provide areas for birds to nest in; hedgerow trees may provide roosting places for bats. Badger setts may be present. Hedgerows also provide a habitat for woodland flora. The EIAR should provide an estimate of the length of any hedgerow that will be lost. Where it is proposed that trees or hedgerows will be removed there should be suitable planting of native species in mitigation incorporated into the EIAR. Where possible, hedgerows and trees should not be removed during the nesting season (i.e. March 1st to August 31st). **EIAR; Watercourses and wetlands:** Wetlands are important areas for biodiversity and ground and surface water quality should be protected during construction and operation of the proposed development. Any watercourse or wetland impacted on should be surveyed for the presence of protected species and species listed on Annexes II and IV of the Habitats Directive. These species could include otters (*Lutra lutra*). which are protected under the Wildlife Acts and listed on

Consultee	Date of Response	Response Details
		Annexes II and IV of the Habitats Directive, salmon (*Salmo salar*) and Lamprey species listed on Annex II of the Habitats Directive, Freshwater Pearl Mussels (*Margaritifera species*) and White-clawed Crayfish (*Austroporamobius pallipes*) which are protected under the Wildlife Acts and listed on Annex II of the Habitats Directive, Frogs (*Rana temporaria*) and Newts (*Trituris vulgaris*) protected under the Wildlife Acts and Kingfishers (*Alcedo atthis*) protected under the Wildlife Acts and listed on Annex I of the Birds Directive (Council Directive 79/409 EEC). One of the main threats identified in the threat response plan for otter is habitat destruction see: https://www.npws.ie/sites/default/files/publications/pdf/2009_Otter_TRP.pdf). A 10m riparian buffer on both banks of a waterway is considered to comprise part of the otter habitat. Therefore any proposed development should be located at least 10m away from a waterway. **EIAR; Bats:** Bat roosts may be present in trees, buildings and bridges. Bat roosts can only be destroyed under licence under the Wildlife Acts and derogation under the Birds and Natural Habitats Regulations and such a licence would only be given if suitable mitigation measures were implemented. Any proposed migratory bat friendly lighting should be proven to be effective. EIAR; Alien invasive species: The EIAR should also address the issue of invasive alien plant and animal species such as Japanese Knotweed, and detail the methods required to ensure they are not accidentally Introduced or spread during survey and or construction. Information on alien Invasive species In Ireland can be found at: http://invasives.biodiversityireland.ie/ and at http://invasivespeciesireland.com/. **EIAR; Bird surveys:** Survey methodologies should follow best practice and if necessary be modified to reflect the Irish situation. Two full years of bird surveys is considered to be minimum required, However, data must be sufficient to support conclusions and this may require substantially more survey work over ;longer periods of time. When survey results are being presented in an EIAR it is important that best practice is followed and that the full survey methodology as well as raw data, including dates and times are detailed. Furthermore, it is expected that bird survey data should be presented in

Consultee	Date of Response	Response Details
		context and records should be supported by basic environmental data such as hourly estimates of visibility, glare arc's, cloud cover and precipitation during VP and walk over survey periods. Results for species need to be referenced back to the overall local, regional, national and European populations and their dynamics as, in some cases even a small risk to a population of a species could be considered significant. It is important that seasonal bird migration routes are considered as well as routes of birds travelling on a daily basis between roosting and feeding areas. **EIAR; Impact assessment:** The impact of the proposed development on the flora/ fauna and habitats present should be assessed with particular regard to Natura 2000 sites, i.e. Special Areas of Conservation (SAC) designated under the EC Habitats Directive (Council Directive 92/43/EEC) and Special Protection Areas designated under the EC Birds Directive (Directive 2009/147 EC), other designated sites, or sites proposed for designation, such as Natural Heritage Areas and proposed Natural Heritage Areas, Nature Reserves and Refuges for Fauna or Flora designated under the Wildlife Acts 1976 to 2012, species protected under the Wildlife Acts including protected flora, 'Protected species and natural habitats', as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008 including Birds Directive - Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur) and Habitats Directive - Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur), important bird areas such as those identified by Birdlife International, features of the landscape which are of major importance for wild flora and fauna, such as those with a "stepping stone" and ecological corridors function, as referenced in Article 10 of the Habitats Directive, other habitats of ecological value in a national to local context (such as those identified as locally important biodiversity areas within Local Biodiversity Action Plans and County Development Plans), Red data book species, and biodiversity in general. Complete project details including Construction Management Plans (CMPs) need to be provided in order to allow an adequate EIAR and appropriate assessment to be undertaken. Applicants need to be able to demonstrate that CMPs and other such plans are adequate and effective mitigation supported by

Consultee	Date of Response	Response Details
		scientific information and analysis and that they are feasible within the physical constraints of the site. The positions, locations and sizes of construction infrastructure and mitigation such as settlement ponds, disposal sites and construction compounds may significantly affect European and other designated sites, habitats and species in their own right and could have an effect for example on drainage, water quality, habitat loss, and disturbance. If these are undetermined at time of the assessment all potential effects of the development on the site are not being considered. **EIAR; Construction Management Plans** Construction Management Plans should contain sufficient detail to avoid any post construction doubt with regard to the implementation of mitigation measures, timings and roles and responsibilities for same. There can be no doubts or lacunae regarding what is required for mitigation, pre-commencement surveys and or licencing requirements. Construction work should not be allowed to impact on water quality and measures should be detailed in the EIAR to prevent sediment and/or fuel runoff from getting into watercourses which could adversely impact on aquatic species. See EIAR; Flood Plains for details with regard to flooding risk. Inland Fisheries Ireland (IFI) should be consulted with regard to impacts on fish species and the applicant may find it useful to consult their publication entitled "Planning for watercourses in the urban environment" which can be downloaded from their web site. If applicants are not in a position to state the exact location and details of cable routes at the time of application, then they need to consider the range of options that may be used within their assessment. It is important to note that NPWS has no post consent role. However, regional staff are available for liaison regarding any associated licencing requirements. **EIAR; Cumulative and ex situ impacts**: A rule of thumb often used is to include all European sites within a distance of 15km. It should be noted however that this will not always be appropriate. In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included. Similarly where bird flight paths are involved the

Consultee	Date of Response	Response Details
		impact may be on an SPA more than 15 km away. Other relevant Local Authorities should be consulted to determine if there are any projects or plans which, in combination with this proposed development, could impact on any European sites. **With regard to; Appropriate Assessment:** In order to carry out the Appropriate Assessment screening, and/or prepare a Natura Impact Statement (NIS), information about the relevant European sites including their conservation objectives will need to be collected. Details of designated sites and species and conservation objectives can be found on http://www.npws.ie/. Site-specific, as opposed to generic, conservation objectives are now available for many sites. Each conservation objective for a qualifying interest (QI) is defined by a list of attributes and targets and is often supported by further documentation. Where these are not available for a site, an examination of the attributes that are used to define site-specific conservation objectives for the same QIs in other sites can be usefully used to ensure the full ecological implications of a proposal for a site's conservation objective and its Integrity are analysed and assessed. It is advised, as per the notes and guidelines in the site-specific conservation objectives that any reports quoting conservation objectives should give the version number and date, so that it can be ensured and established that the most up-to-date versions are used in the preparation of Natura Impact Statements and in undertaking appropriate assessments. The Departmental guidance document on Appropriate Assessment is available on the NPWS web site at https://www.npws.ie/development-consultations and in the EU Commission guidance entitled "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC' which can be downloaded from; http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_200 0_assess_en.pdf CJEU and Irish case law has clarified some issues and should also be consulted. **With regard to; Post construction monitoring:** This Department recognises the importance of pre and post construction monitoring, such as recommended in Drewitt et al. (2006), and Bat Conservation Ireland (2012). The applicant should not use any proposed post construction monitoring as mitigation to supplement inadequate

Consultee	Date of Response	Response Details
		information in the assessment. Please refer to Circular Letter PD 2/07 and NPWS 1/07 on this issue. This can be downloaded from the Department's website https://www.npws.ie/development-consultations The EIAR process should identify any pre and post construction monitoring which should be carried out. The post construction motoring should include bird and bat strikes/fatalities including the impact on any such results of the removal of carcasses by scavengers. Monitoring results should be made available to the competent Authority and copied to this Department. A plan of action needs to be agreed at planning stage with the Planning Authority if the results in future show a significant mortality of birds and/or bat species. It is important to note again that NPWS has no post consent role. However, regional staff are available for liaison regarding any associated licencing requirements and or new information arising for specific species of concern. Note: any significant change to mitigation may require amendment and where a licence has expired; there will be a need for new licence applications for protected species. **With regard to; Licenses:** Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Acts or derogations under the Habitats Regulations. In particular bats and otters are strictly protected under annex IV of the Habitats Directive. A copy of Circular Letter NPWS 2/07 entitled "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for derogation licences" can be found on the Departmental web site at www.npws.ie/sites/default/files/general/circular-npws-02-07.pdf. It should be noted however that the Regulations of 1997 have since been revoked and that Part 6 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 is now the relevant part dealing with the protection of flora and fauna. In particular reference to Regulation 23 in the circular letter should be taken to mean Regulation 51 in the current Regulations. In addition the planning authority will be required to take account of species protected under sections 21, 22 and 23 of the Wildlife Acts if there are any impacts on other protected species or their resting or breeding places, such as on protected plants, badger setts or birds' nests. They will also need to

Consultee	Date of Response	Response Details
		be cognisant of article 5 (d) of the Birds Directive. For that reason vegetation, including hedges and trees, should not be removed during the nesting season (i.e. March 1st to August 31st). In order to apply for any such licenses or derogations as mentioned above the results of a survey should be submitted to the National Parks and Wildlife Service of this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Details of survey methodology should also be provided. Should this survey work take place well before construction commences, it is recommended that an additional ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the findings of the baseline ecological survey has occurred. If there has been any significant change mitigation may require amendment and where a licence has expired, there will be a need for new licence applications for protected species. **With regard to; Baseline data:** Other sources of habitat and species information beyond those already identified and the standard NPWS data request include (but are not be limited to) the National Biodiversity Data Centre (www.biodiversityireland.ie). Inland Fisheries Ireland (www.fisheriesireland.ie). BirdWatch Ireland (www.birdwatchireland.ie), Irish Raptor Study Group, Golden Eagle Trust and Bat Conservation Ireland (www.batconservationlreland.org). Data may also exist at a County level within the Planning Authority. Further to the above general comments please find below specific observations relating to the site in question. › Specific consideration should be given to assessing risks, associated with the development, to seasonaly resident and migratory bird species that are SCI for European sites in close proximity e.g. Whooper Swan (Cygnus cygnus) [A038]. Furthermore, the EIAR bird survey recommendations above suggest that bird survey data should be presented in context and records should be supported by basic environmental data such as hourly estimates of visibility, glare arc's, cloud cover and precipitation during VP and walk over survey periods. Moreover, two years of survey data is

Consultee	Date of Response	Response Details
		a guide to the minimum requirement for assessment of potential affects. However, the data must be sufficient to support conclusions in the EIAR and NIS reports irrespective of duration and or method required (i.e. more than two years data may be required and additional methods may be required beyond vantage point (VP) and walk over surveys). › The Scoping document identifies Lough Swedy (site code 000689) as an SPA, this is not in keeping with NPWS map viewer information and it is evident that a more comprehensive desktop study is required. › The site is located in an area that has strong hydraulically links to several protected sites. As a result, the management of surface and sub-surface water, water tables and drainage carries an elevated risk with regard to this proposed development. › Any new or revised documentation should be cognisant of the Departments previous observations relating to wind farm development applications in the area, or related applications. › The cumulative impact of the development and other associated wind farm developments in the wider area should be clearly assessed, particular emphasis should be given to the barrier effect and bird strike. › Efforts must be made to source and use all relevant data regarding site usage by Annex and endangered bird species. › There can be lacunae or unknowns in the NIS, because it is not appropriate for the details of proposed mitigation measures to be agreed post consent (see Circular PD 2/07 and NPWS 1/07). The detail of any proposed mitigation measure must be available as part of the assessment and prior to any decision in relation to the application. › In relation to European sites particular emphasis is placed in our observations on the adequacy of data, information and analyses available in the NIS, and on the implications of the proposed development for the conservation objectives and integrity of the European sites affected. This is because an appropriate assessment must contain complete, precise and definitive findings and conclusions with regard to the implications of a proposal for the conservation objectives and integrity of a European site(s).
Waterways Ireland	No Response	N/A

Consultee	Date of Response	Response Details
Department of Agriculture, Food & Marine	08/02/2022	If the proposed development will involve the felling or removal of any trees, the developer must obtain a Felling License from this Department before trees are felled or removed. A Felling Licence application form can be obtained from Felling Section, Department of Agriculture, Food and the Marine, Johnstown Castle Estate, Co. Wexford. Tel: 076-1064459, Web https://www.agriculture.gov.ie/forestservice/treefelling/treefelling/ A Felling Licence granted by the Minister for Agriculture, Food and the Marine provides authority under the Forestry Act 2014 to fell or otherwise remove a tree or trees and/or to thin a forest for silvicultural reasons. The Act prescribes the functions of the Minister and details the requirements, rights and obligations in relation to felling licences. The principal set of regulations giving further effect to the Forestry Act 2014 are the Forestry Regulations 2017 (S.I. No. 191 of 2017). The developer should take note of the contents of Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling; https://www.agriculture.gov.ie/media/migration/forestry/treefelling/FellingReforestationPolicy240517.pdf. As this development is within forest lands, particular attention should be paid to deforestation, turbulence felling and the requirement to afforest alternative lands. In order to ensure regulated forestry operations in Ireland accord with the principles of sustainable forest management (SFM), as well fulfilling the requirements of other relevant environmental protection laws, the Department (acting through its Forest Service division) must undertake particular consultations, and give certain matters full consideration during the assessment of individual Felling Licence applications. This includes consultation with relevant bodies, the application of various protocols and procedures (e.g. Forest Service Appropriate Assessment Procedure), and the requirement for applicants on occasion to provide further information (e.g. a Natura Impact Statement).

Consultee	Date of Response	Response Details
		Consequently, when the Forest Service is considering an application to fell trees, the following applies: **1.** The interaction of these proposed works with the environment locally and more widely, in addition to potential direct and indirect impacts on designated sites and water, is assessed. Consultation with relevant environmental and planning authorities may be required where specific sensitivities arise (e.g. local authorities, National Parks & Wildlife Service, Inland Fisheries Ireland, and the National Monuments Service); **2.** Where a tree Felling Licence application is received, the Department will publish a notice of the application before making a decision on the matter. The notice shall state that any person may make a submission to the Department within 30 days from the date of the notice. The notices for 2020 are published online at: https://www.agriculture.gov.ie/forestservice/publicconsultation/environmentalimpactassessmenteiapublicconsultationforafforestationforestroadconstructionandfellinglicenses2020/ **3.** Third parties that make a submission or observation will be informed of the decision to grant or refuse the licence, and on request, details of the conditions attached to the licence, the main reasons and considerations on which the decision to grant or refuse the licence was based, and where conditions are attached to any licence, the reasons for the conditions. Both third parties and applicants will be also informed of their right to appeal any decision within 28 days to the Forestry Appeals Committee. Felling Licence decisions for 2020 are published online at: https://www.agriculture.gov.ie/forestservice/publicconsultation/environmentalimpactassessment-2020registerofdecisions/ It is important to note that when applying to a Local Authority, or An Bord Pleanàla, for planning permission where developments are: a) subject to an EIA procedure (including screening in the case of a sub-threshold

Consultee	Date of Response	Response Details
		development) and any resulting requirement to produce an EIAR; and/or b) subject to an Appropriate Assessment procedure (including screening) and any resulting requirement to a Natura Impact Statement (NIS); and c) the proposed development in its construction or operational phases, or any works ancillary thereto, would directly or indirectly involve the felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species, 1. that there is a requirement inter alia under the EIA Directive for an overall assessment of the effects of the project or the alteration thereof on the environment to be undertaken, including the direct and indirect environmental impact of the project; and 2. pursuant to Article 2(3) of the EIA Directive, the Department of Agriculture, Food and the Marine strongly recommends that, notwithstanding the fact that a parallel consent in the form of felling licence may also have to be applied for, any EIAR and/or NIS produced in connection with the application for planning permission to the Local Planning Authority or An Bord Pleanàla, should include an assessment of the impact of and measures, as appropriate, to prevent, mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from such felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species

6.5.3 Field Surveys

Comprehensive surveys of the biodiversity of the entire Site were undertaken on various dates during 2021 and 2022 as detailed below. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

6.5.3.1 Multi-disciplinary Walkover Surveys (as per NRA Guidelines, 2009)

Multidisciplinary walkover surveys were undertaken on the 29th July 2021, 4th August 2021, 17th February, 2022, 11th March 2022, 19th August 2022. The habitat surveys of the Site covered the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire Site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys including for otter, bats, aquatic invertebrate surveys and quadrat surveys.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for badger setts and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur within the vicinity of the Proposed Development (e.g. otter etc.). In addition, an inventory of other species of local biodiversity interest was compiled including invertebrates (butterflies, dragonflies, damselflies, beetles), plants, fungi etc.

The multi-disciplinary walkover surveys comprehensively covered the lands within the EIAR Site Boundary and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna* on National Road Schemes (NRA, 2009).

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

Other targeted survey methodologies undertaken at the Site are described in the following subsections.

6.5.3.2 Dedicated Habitat and Vegetation Composition Surveys

All habitats recorded on site and described in this EIAR chapter have been classified in accordance with Fossitt (2000). In addition, habitats outside of the Proposed Development infrastructure footprint but within the survey area are described in detail in this chapter. Full results of all the botanical surveys are provided in Appendix 6-1 and an assessment of the potential for the Site to support Annex I habitats is also provided in this Appendix.

Botanical surveys of the Site were also undertaken throughout multidisciplinary walkover surveys carried out in 2021 and 2022 These surveys provided an understanding of the baseline and informed further survey work following finalisation of the Proposed Development infrastructure layout. The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 27. European Commission DG Environment.
- NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland*. Volume 2: *Habitat Assessments*. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), The *monitoring and assessment of three EU Habitats Directive Annex I grassland habitats*. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), *The Irish semi-natural grasslands survey 2007-2012*. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- NPWS (2018) *Conservation Objectives*: Killeglan Grassland SAC 002214. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010), while mosses and liverworts nomenclature follows '*Mosses and Liverworts of Britain and Ireland - a field guide'* (British Bryological Society, 2010).

6.5.3.2.1 *Vegetation composition assessment*

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the Proposed Development footprint, with relevés undertaken on the 29th July, 4th August and 19th August 2022 within representative habitats at each turbine base and associated infrastructure, see Figure 6-2 and Appendix 6-1 for all quadrat data. Habitat verification surveys were also carried out on the 19th August 2022 to ensure habitat composition remained the same as previous surveys. The extent of each habitat on the Site was mapped using aerial photography, handheld GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on the Site, including relevés. The location of all quadrats is shown in Figure 6-2.

The survey results were then analysed in accordance the Irish Vegetation Classification (IVC) system. The IVC is a project with aims to classify, describe, and map in detail all aspects of natural and semi-natural vegetation in Ireland within a single, unified framework. The National Vegetation Database (NVD), upon which the IVC is based, holds data for over 30,000 relevés and is the core resource upon which the classification system is based.

A fundamental requirement of the IVC is to *"aid in definition and* ***identification*** *of EU Habitat Directive (92/43/EEC) Annex I habitats*" and to '*inform the planning process, for example through environmental impact assessments*'.

The Engine for Relevés to Irish Communities Assignment (ERICA)[3] is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin, 2019).

The data collected from the botanical assessments was uploaded to ERICA, analysed and the results data downloaded.

The analysis procedure uses a clustering process to assign classification affinity to vegetation plots based on a degree of membership to each of the communities defined by the IVC. Table 6-2 details the categorizing types of plots utilizing the clustering analysis. This categorizing procedure was utilized to determine if the grassland plots within the survey area had any affinity to Annex I grassland and whether further assessment was required.

Table 6-2: Categorising types of plots using clustering analysis (after Wiser & de Cáceres, 2013).

Plot Type	Definition
Assigned	The plot has membership ≥ 0.5 for one of the vegetation communities and therefore relates to the core definition of that vegetation community.
Unassigned	The plot has membership ≥ 0.5 for the noise class and is poorly represented by the current classification scheme
Transitional	The plot has membership < 0.5 for all vegetation communities and for the noise class. It falls within the scope of the current classification scheme but does not relate to the core definition of any of the vegetation communities.

[3] *Perrin, 2019, ERICA – Engine for Relevés to Irish Communities Assignment V5.0 User's Manual, Online, Available at: https://biodiversityireland.shinyapps.io/vegetation-classification/_w_9cd4889a/manual.pdf, Accessed: 10.10.2020*

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified and classified as Key Ecological Receptors (KERs).

Q1
T1
T2
Q2
T3
Q3
Q4
T4
T5
Q5
T6
Q6
Q7
T7
Q8
T8
Q9
T9

Map Legend

- EIAR Site Boundary
- Quadrat Locations
- Proposed Turbine Hardstands
- Proposed Turbine Layout
- Proposed Met Mast
- Proposed New Roads
- Proposed Upgrades to Existing Roads
- Proposed Onsite Substation
- Proposed Temporary Construction Compounds

N

Drawing Title
Botanical Quadrat Locations

Project Title
Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
201050	Figure 6-3
Scale	Date
1:15000	2023-01-20

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6.5.3.3 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for bats, otter and badger were undertaken at the times set out below with the methodologies followed also provided below. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded.

6.5.3.3.1 *Badger Survey*

Areas identified as providing potential habitat for badger were subject to specialist targeted survey. Dedicated badger surveys were conducted on the 25th October, 17th December 2019, 8th & 22nd May, 22nd July, 04th September & 24th September 2020 and 30th March 2021. The badger surveys covered the entire EIAR Site Boundary and surrounding suitable habitats in the survey area. Targeted surveys were also undertaken in areas where incidental badger signs, setts or sightings were recorded during walkover bird surveys of the Site. The badger survey was not constrained by vegetation given the nature of the habitats within the Site and the timing of the surveys (NRA 2006a).

The badger surveys were conducted in order to determine the presence or absence of badger signs within and outside (areas of identified suitable habitat) the site of the Proposed Development and wider survey area. This involved a search for all potential badger signs as per NRA (2009) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in NRA (2009) (i.e. main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (NRA, 2009) and followed the *'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes'* (NRA, 2006a) and CIEEM best practice competencies for species surveys (CIEEM, 2013[4]).

6.5.3.3.2 *Otter Survey*

A number of watercourses are present within the Wind Farm Site, and it is proposed to construct a clear-span watercourse crossing along the Wind Farm Site access roads at 1 no. location using a clear-span bridge. The Grid Connection underground electrical cabling route will require the crossing of watercourses at existing crossing and culvert locations; 34 crossings are identified along the proposed route of which 11 no. are EPA/OSI mapped crossings. The remaining crossings are classified as culverts over minor channels or manmade drains. Where watercourses were identified as providing potential habitat for otter these were subject to specialist targeted survey on the 17th February 2022 along with other watercourses within the Site, and during dedicated aquatic site surveys carried out during August 2022.

The otter survey was conducted as per TII (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter survey also followed the guidance as set out in NRA (2008) *'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes'* and following CIEEM best practice competencies for species surveys (CIEEM, 2013[5]).

[4] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: https://cieem.net/resource/competencies-for-species-survey-css/ Accessed: 20.03.2021*
[5] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: https://cieem.net/resource/competencies-for-species-survey-css/ Accessed: 20.03.2021*

6.5.3.3.3 *Bat Surveys*

Detailed description of the survey methodologies undertaken at the Site during the survey period April 2020 and September 2020 are provided within the full Bat Report included as Appendix 6-2 of this EIAR, together with full details of the survey times and the surveyors who carried out the bat survey and assessment work.

Survey design and effort in 2020 was created in accordance with the best practice guidelines available at the time, '*Bat Surveys: Good Practice Guidelines'* prepared by the Bat Conservation Trust (Hundt, 2012). Surveys undertaken were undertaken in strict accordance with those prescribed in SNH (2019) '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*'. This is in line with standard best practice industry guidelines.

Habitat walkover surveys of the Site carried out during 2021 and 2022 ascertained that the suitability of habitats of the Site for bats remained consistent with those recorded and assessed in 2020. Table 6-3 below provides the dates of the bat surveys carried out.

Table 6-3: Bat Survey Effort

Multidisciplinary Survey	Dedicated Bat Survey
29th July 2021	7th May 2020
4th August 2021	9th July 2020
17th February 2022	10th July 2020
11th March 2022	17th September 2020
19th August 2022	18th September 2020
	5th April 2022
	20th April 2022
	1st July 2022
	21st July 2022
	18th August 2022
	6th September 2022

6.5.3.3.4 *Aquatic surveys*

Habitat Assessment and Macroinvertebrate Kick Sampling (MKO)

Watercourses within the Site were appraised to evaluate potential for salmonid and lamprey spawning and general fisheries habitat. River habitat surveys were carried out utilising elements of the approaches in the River Habitat Survey Methodology (EA, 2003) and Fishery Assessment Methodology (O'Grady, 2006) to broadly characterise the riverine sites (i.e. channel profiles, substrata etc.) and watercourses assessed for their potential to support species such as salmonids, lamprey and crayfish.

Invertebrate sampling was conducted on the 19th of August 2022, at carefully determined locations within the EIAR Site Boundary. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005). The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present. The results of the surveys at 4 sampling stations are provided in Section 6.5.2.4.7 below.

The locations of each watercourse surveyed are provided in Figure 6-3.

Map Legend

- EIAR Site Boundary
- Kick Sample Locations
- WFD Watercourses

N

Drawing Title: Kick Sample Locations

Project Title: Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
201050	Figure 6-3
Scale	Date
1:50000	2023-01-24

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6.5.3.4 Invasive species survey

During the multi-disciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended).

6.5.4 Methodology for Assessment of Impacts and Effects

6.5.4.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, initial site visits (main ecological surveys of the Site undertaken on the 29th July 2021, 4th August 2021, 17th February, 2022, 11th March 2022, 19th August 2022 not including bat surveys) and stakeholder consultation; "Target receptors" likely to occur in the zone of influence of the Proposed Development were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of impact.
- Species protected under the Wildlife Acts 1976-2019
- Species protected under the Flora Protection Order 2015

6.5.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the survey area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.5.4.3 Characterisation of Impacts and Effects

The Proposed Development will result in a number of potential impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2022). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the Proposed Development results in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.5.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed
- There will be an effect on the nature, extent, structure and function of important ecological features
- There is an effect on the average population size and viability of ecologically important species.

- There is an effect on the conservation status of important ecological habitats and species.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2022) as shown in Table 6-4.

Table 6-4: Criteria for determining significance of effect, based on (EPA, 2022) guidelines

Description of Effect	Definition
Imperceptible effect	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound effects	An effect which obliterates sensitive characteristics.

As per TII (NRA, 2009) and CIEEM (2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects:

- The likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009).
- A 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018).

Integrity

In the context of EcIA, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (NRA, 2009). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area

- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

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

The conservation of a species is favourable when:

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

According to the NRA/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international).

6.5.4.5 Incorporation of Mitigation

Section 6.6 of this EIAR assesses the potential effects of the Proposed Development to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation has been incorporated into the Proposed Development design or layout to address such impacts. The implemented of mitigation measures seeks to avoid or where avoidance is not possible to reduce or offset potentially significant residual effects, post mitigation. The mitigation measures proposed are judged to be appropriate and adequate to remove the potential for significant effects on ecological receptors assuming their full implementation.

6.5.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons, provides an accurate prediction of the likely ecological effects of the Proposed Development; prescribes best practice construction methods and mitigation measures as necessary; and describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the Site were readily identifiable and comprehensive assessments were made during the field visits. No significant limitations in the scope, scale or context of the assessment have been identified.

6.6 Establishing the Ecological Baseline

6.6.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the Site Synopses for designated sites within the zone of influence, as compiled by the National Parks and Wildlife Service

(NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

6.6.1.1 Designated Sites

6.6.1.1.1 *Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Development*

The potential for the Proposed Development to impact on sites that are designated for nature conservation was considered in this Ecological Impact Assessment.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process but it should refer to the findings of that separate assessment in the context of the likely significant effects on the environment, as required by the EIA Directive"*. Section 6.6.2 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EcIA.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the Proposed Development:

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 10/03/2021 (rechecked 10/01/2023). The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Development.
- Potential for connectivity with European or Nationally designated sites from the Proposed Development was considered in this initial assessment. In addition, potential hydrological connectivity along the Grid Connection (particularly the underground electrical cabling route) to any downstream designated sites was assessed, and where connectivity was identified these designated sites were also considered to be within the potential likely zone of impact.
- A map showing European Sites within the potential Likely Zone of Impact of the Proposed Development is provided in Figure 6-4 with all Nationally designated sites shown in Figure 6-5. Sites further away from the Proposed Development were also considered however no potential pathway for effect on any other sites additional to the sites considered in this EIAR chapter was identified.
- Table 6-5 provides details of all relevant designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All European Designated Sites are fully described and assessed in light of their specific conservation objectives within the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.

- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 11/08/2022 (rechecked 10/01/2023).

Lough Ree SAC
Lough Ree SAC
Lough Ree SPA
Lough Ree SAC
Lough Owel SPA
Lough Owel SAC
Woo
Ballymore Fen SAC
Lough Ennell SAC
Lough Ennell SPA
Carn Park Bog SAC
Crosswood Bog SAC
Middle Shannon Callows SPA
Split Hills and Long Hill Esker SAC
iddle Shannon Callows SPA
ver Shannon Callows SAC
Pilgrim's Road Esker SAC
Mongan Bog SAC
Mongan Bog SPA
Fin Lough (Offaly) SAC
Clara Bog SAC
Raheenmore Bog SAC
Ferbane Bog SAC
Moyclare Bog SAC
Charleville Wood SAC
on Callows SPA

Map Legend

- EIAR Site Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- WFD Catchments
- WFD Subcatchments
- WFD River Waterbodies

Drawing Title: European Sites within the Potential Likley Zone of Influence

Project Title: Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
123456	Figure 5-5
Scale	Date
1:140000	2023-01-20

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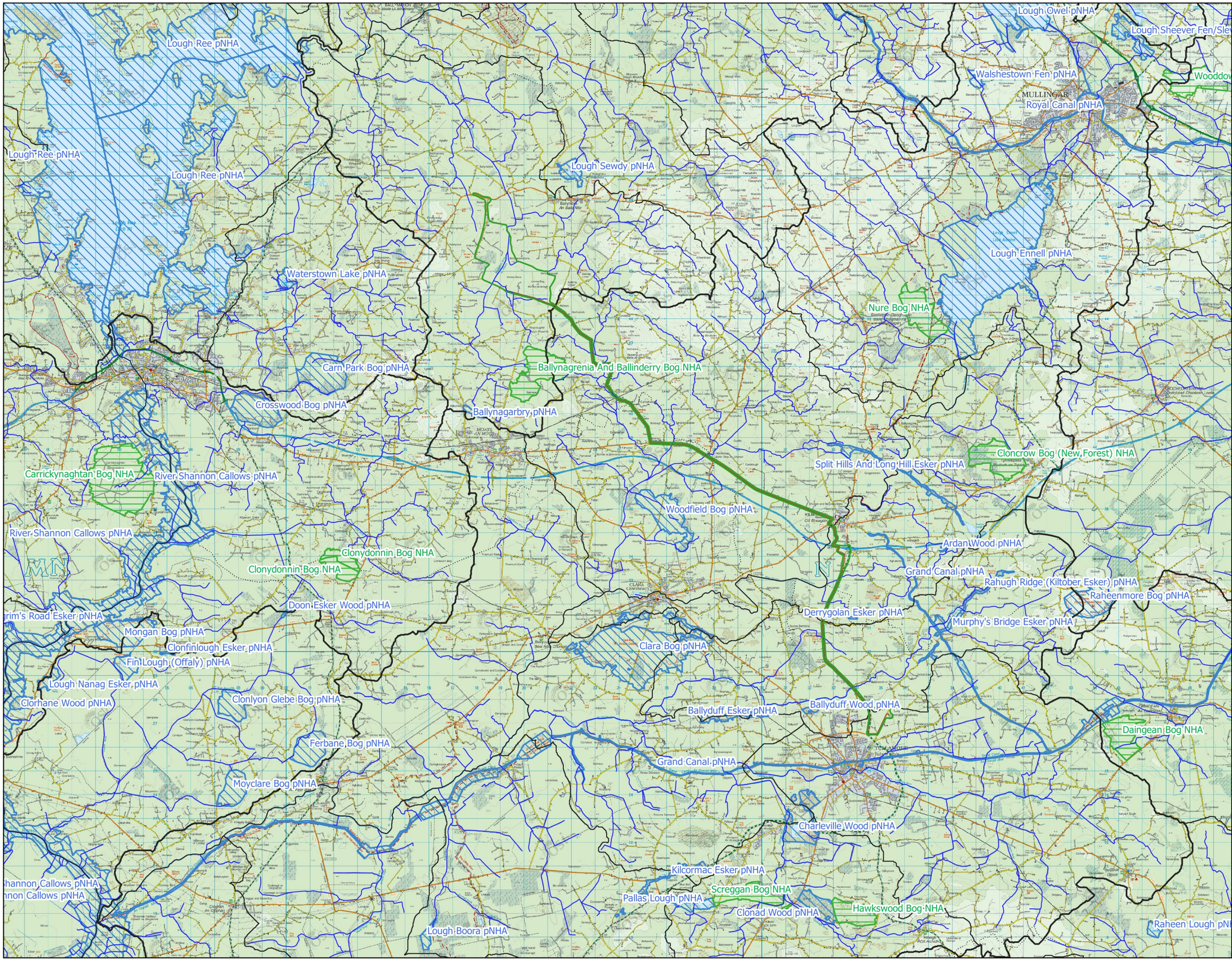

Map Legend

- EIAR Site Boundary
- Natural Heritage Area (NHA)
- Proposed Natural Heriatge Area (pNHA)
- WFD Catchments
- WFD Subcatchments
- WFD River Waterbodies

Drawing Title
Nationally Designated Sites within the Potential Likley Zone of Influence

Project Title
Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
123456	Figure 5-6
Scale	Date
1:140000	2023-01-20

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Table 6-5: Identification of Designated Sites within the Likely Zone of Impact of the Proposed Development

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
Ballymore Fen SAC [002313] **Distance to Wind Farm Site:** 4.2km (5.2km from Grid Connection underground electrical cabling route at its closest point)	› Transition mires and quaking bogs [7140]	Detailed conservation objectives for this site (Version 1, October, 2018[6]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002313.pdf	There will be no direct effects as the Proposed Development footprint is located entirely outside the designated site. There will be no land take or possibility of encroachment into the SAC as part of the construction, operational or decommissioning phases of the Proposed Development; therefore, no pathways for direct effects on the QI habitats of the SAC exist. The Grid Connection underground electrical cabling route is located within the same hydrological sub-catchment (Inny (Shannon)_SC_090) as the SAC, but no hydrological connectivity exists as the SAC is located upstream of the Proposed Development works. There is therefore no potential pathway for significant effects on the QI habitat of the SAC.

[6] *NPWS (2018) Conservation Objectives: Ballymore Fen SAC 002313. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
			No other potential pathway for significant effect on this SAC exists. **The SAC is *outside* the Likely Zone of Impact and no further assessment is required.**
Carn Park Bog SAC [002336] **Distance to Wind Farm Site:** 6.9km (7.5km from Grid Connection underground electrical cabling route at its closest point)	› Active raised bogs [7110] › Degraded raised bogs still capable of natural regeneration [7120]	Detailed conservation objectives for this site (Version 1, November 2015[7]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002336.pdf	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. The Proposed Development site is not located within the same catchment to the SAC. Therefore, no hydrological connectivity to the SAC has been identified. Therefore there will be no effect on groundwater within the locality and no pathway for indirect effects on the aquatic dependant and marine habitats of the SAC exist.

[7] *NPWS (2015) Conservation Objectives: Carn Park Bog SAC 002336. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
			The SAC is *outside* the Likely Zone of Impact, no further assessment is required.
Lough Ree SAC [000440] **Distance to Wind Farm Site:** 9.1km (10.8km from Grid Connection underground electrical cabling route at its closest point)	**Habitats** › Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] › Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Active raised bogs [7110] › Degraded raised bogs still capable of natural regeneration [7120] › Alkaline fens [7230] › Limestone pavements [8240] › Bog woodland [91D0] **Species** › Lutra lutra (Otter) [1355]	Detailed conservation objectives for this site (Version 1, August 2016[8]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000440.pdf	There will be no direct impact on the SAC as it is located entirely outside of the footprint of the Proposed Developmental site. Due to the nature and scale of the Proposed Development, no potential pathway for effect on terrestrial Qualifying Interests (QIs) for which the SAC is designated exists. The Proposed Development site partially shares the same catchment as the SAC. Taking a precautionary approach, a potential pathway for indirect effects was identified in the form of deterioration of water quality via surface water pathways during the construction and operational phases. Deterioration of water quality may result in adverse effects on aquatic and groundwater influenced QIs within this SAC in the absence of mitigation:

[8] *NPWS (2016) Conservation Objectives: Lough Ree SAC 000440. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
			The SAC is considered to be *within* the Likely Zone of Impact and further assessment is required with regard to the above listed QI of the SAC.
Crosswood Bog SAC [002337] **Distance to Wind Farm Site:** 10.2km (10.9km from Grid Connection underground electrical cabling route at its closest point)	› Active raised bogs [7110] › Degraded raised bogs still capable of natural regeneration [7120]	Detailed conservation objectives for this site (Version 1,February 2016[9]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002337.pdf	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. The Proposed Development site is not located within the same catchment to the SAC. No hydrological connectivity to the SAC has been identified. Therefore there will be no effect on groundwater within the locality and no pathway for indirect effects on the aquatic dependant habitats of the SAC exist.

[9] *NPWS (201c) Conservation Objectives: Crosswood Bog SAC 002337. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
			The SAC is *outside* of the Likely Zone of Impact, no further assessment is required.
Split Hills and Long Hill Esker SAC [001831] **Distance to Wind Farm Site:** 13.1km (2.6km from Grid Connection underground electrical cabling route at its closest point)	› Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	Detailed conservation objectives for this site (Version 1, June 2018[10]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001831.pdf	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. **The SAC is *outside* the Likely Zone of Impact, no further assessment is required.**

[10] *NPWS (2018) Conservation Objectives: Split Hills and Long Hill Esker SAC 001831. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Clara Bog SAC [000572] **Distance to Wind Farm Site:** 13.4km (4.6km from Grid Connection underground electrical cabling route at its closest point)	› Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] › Active raised bogs [7110] › Degraded raised bogs still capable of natural regeneration [7120] › Depressions on peat substrates of the Rhynchosporion [7150] › Bog woodland [91D0]	Detailed conservation objectives for this site (Version 1, 3 August 2016[11]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000572.pdf	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. The Proposed Development site is not located within the same catchment to the SAC. No hydrological connectivity to the SAC has been identified. Therefore there will be no effect on groundwater within the locality and no pathway for indirect effects on the aquatic dependant habitats of the SAC exist. **The SAC is *outside* the Likely Zone of Impact, no further assessment is required.**
River Shannon	› Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	Generic conservation objectives for this site	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development.

[11] *NPWS (2016) Conservation Objectives: Clara Bog SAC 000572. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Callows SAC [000216] **Distance to Wind Farm Site:** 14.7km (15.3km from Grid Connection underground electrical cabling route at its closest point)	› 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]	(March 2021[12]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000216.pdf The objective is as follows: '*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected*	Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. The Proposed Development site is not located within the same catchment to the SAC. However potential hydrological connectivity has been identified between the Silver (Tullamore) watercourse crossing the Grid Connection underground electrical cabling route and the SAC. Taking a highly precautionary approach, potential for deterioration in water quality on the aquatic Qis of the SAC has been identified. **The SAC is *within* the Likely Zone of Impact; further assessment is required.**
Lough Ennel SAC [000685]	› Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] › Alkaline Fens [7230]	Detailed conservation objectives for this site (Version 1, January 2018[13]) were reviewed as part of the assessment and are available at:	

[12] *NPWS (2022) Conservation Objectives: River Shannon Callows SAC 000216. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*
[13] *NPWS (2018) Conservation Objectives: Lough Ennell SAC 000685. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Distance to Wind Farm Site: 16.1 km (8.6km from Grid Connection underground electrical cabling route at its closest point)		https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000685.pdf	There will be no direct impact on the SAC as it is located entirely outside the footprint of the Proposed Development. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this SAC. The Proposed Development site is not located within the same catchment to the SAC. Therefore, no hydrological connectivity to the SAC has been identified. Therefore there will be no effect on groundwater within the locality and no pathway for indirect effects on the aquatic dependant and marine habitats of the SAC exist. **The SAC is *outside* the Likely Zone of Impact, no further assessment is required.**
Special Protection Areas (SPA)			
Lough Ree SPA [004064]	› Little Grebe (Tachybaptus ruficollis) [A004] › Whooper Swan (Cygnus cygnus) [A038] › Wigeon (Anas penelope) [A050]	Generic conservation objectives for this site	There will be no direct impact on the SPA as it is located entirely outside of the footprint of the Proposed Development.

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Distance to Wind Farm Site: 9.3km (10.9km from Grid Connection underground electrical cabling route at its closest point)	› Teal (Anas crecca) [A052] › Mallard (Anas platyrhynchos) [A053] › Shoveler (Anas clypeata) [A056] › Tufted Duck (Aythya fuligula) [A061] › Common Scoter (Melanitta nigra) [A065] › Goldeneye (Bucephala clangula) [A067] › Coot (Fulica atra) [A125] › Golden Plover (Pluvialis apricaria) [A140] › Lapwing (Vanellus vanellus) [A142] › Common Tern (Sterna hirundo) [A193] › Wetland and Waterbirds [A999]	(March 2021[14]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004064.pdf The objective is as follows: 'To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ree SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'.	The SPA is located downstream within the same hydrological sub-catchment to the Site (Inny(Shannon)_SC_090); therefore, potential hydrological connectivity exists between the Proposed Development site and the SPA, as water flow from within the Proposed Development site is to the north to the SPA. This may result in potential hydrological connectivity to the SAC, therefore the works have the potential, in the absence of mitigation, potential impact exists for significant effects on supporting Wetlands and Waterbirds [A999] habitat. This SCI includes the supporting wetland habitat of all SCI species. **This SPA is *within* the Likely Zone of Impact and further assessment is required.**
Middle Shannon Callows SPA	› Whooper Swan (Cygnus cygnus) [A038] › Wigeon (Anas penelope) [A050] › Corncrake (Crex crex) [A122]	Generic conservation objectives for this site (March 2021[15]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004096.pdf	There will be no direct impact on the SPA as it is located entirely outside of the footprint of the Proposed Development.

[14] : *NPWS (2021) Conservation objectives for Lough Ree SPA [004064]. Generic Version 8.0. Department of Housing, Local Government and Heritage*
[15] : *NPWS (2021) Conservation objectives for Middle Shannon Callows SPA [004096]. Generic Version 8.0. Department of Housing, Local Government and Heritage.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
[004096] **Distance to Wind Farm Site:** 14.1km (15.3km from Grid Connection underground electrical cabling route at its closest point)	› 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]	The objective is as follows: 'To maintain or restore the favourable conservation condition of the wetland habitat at Middle Shannon Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'.	Of the seven SCI species of the SPA, the following were recorded within 500m of the Wind Farm Site during two years of bird surveys: whooper swan, golden plover, lapwing and black-headed gull. The distance between the SPA and the Wind Farm Site is greater than the core foraging ranges of these species (SNH, 2016; Johnson *et al.*, 2014; Thaxter *et al.*, 2017). As such, there is no connectivity between the SCI species of the SPA and the Proposed Development. The Proposed Development site is not located within the same catchment to the SAC. However potential connectivity has been identified between watercourses crossing the Grid Connection underground electrical cabling route and the SPA. Taking a highly precautionary approach, potential for deterioration in water quality on the supporting Wetlands and Waterbirds [A999] habitat. This SCI includes the supporting wetland habitat of all SCI species. **This SPA is *within* the Likely Zone of Impact; further assessment required.**

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
Lough Ennel SPA [004044] **Distance to Wind Farm SSite:** 16.1km (9.3km from Grid Connection underground electrical cabling route at its closest point)	› Pochard (Aythya ferina) [A059] › Tufted Duck (Aythya fuligula) [A061] › Coot (Fulica atra) [A125] › Wetland and Waterbirds [A999]	Generic conservation objectives for this site (March 2021[16]) were reviewed as part of the assessment and are available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004044.pdf The objective is as follows: 'To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ennel SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'.	There will be no direct impact on the SPA as it is located entirely outside of the footprint of the Proposed Development. The Wind Farm Site is located outside the potential foraging range of SCI species associated with the SPA. It is also located outside the zone of sensitivity of any species that is listed as particularly sensitive to wind energy development in Mc Guinness *et al.* (2015). Consequently, the potential for direct and indirect impacts on populations of SCI species associated with the SPA can be discounted. The SPA is located in a different hydrological catchment to the Proposed Development. Therefore, there is no potential pathway for indirect effects related to a deterioration in water quality on supporting wetland habitat.

[16] : *NPWS (2021) Conservation objectives for Lough Ennell SPA [004044]. Generic Version 8.0. Department of Housing, Local Government and Heritage.*

European Sites and distance from Proposed Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 15/07/2021	Conservation Objectives	Likely Zone of Impact Determination
			This SPA is *outside* the Likely Zone of Impact, no further assessment required

Table 6-6 Identification of Nationally designated sites within the Likely Zone of Impact

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
Natural Heritage Areas (NHA)		
Ballynagrenia and Ballinderry Bog NHA (000674)	1.9km from Wind Farm Site (0.95km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside the boundary the designated site. The listed NHA is designated for rain fed peatland habitat. Due to the terrestrial nature of the QI habitat and the intervening distance and lack of any hydrological connectivity from the Site, there is no potential for indirect effects to this NHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Clonydonnin Bog NHA [000565]	12.5km from Wind Farm Site (12.8km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. The listed NHA is designated for rain fed peatland habitat. Due to the terrestrial nature of the QI habitat and the intervening distance and lack of any hydrological connectivity from the Site, there is no potential for indirect effects to this NHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Nure Bog NHA	14.5km from Wind Farm Site (8.5km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. The listed NHA is designated for rain fed peatland habitat. Due to the terrestrial nature of the QI habitat and the intervening distance and lack of any hydrological connectivity from the Site, there is no potential for indirect effects to this NHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
Proposed Natural Heritage Area (pNHA)		
Lough Sewdy pNHA [000689]	3.1km from Wind Farm Site (5km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Development site. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to cutaway raised bog habitat of this pNHA. The Proposed Development site is within the a separate hydrological sub-catchment to the pNHA, and no hydrological connectivity to the pNHA exisits. Therefore, no pathway for indirect effects on the aquatic habitats of the pNHA exist. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Ballynagarby pNHA [001713]	5.1km from Wind Farm Site (5.1km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Development site. Due to the terrestrial nature of the QI esker habitats and the intervening distance there is no potential for indirect effects to this pNHA. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Carn Park Bog pNHA [000676] (*also designated as an SAC*)	6.3km from Wind Farm Site (7.5km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. Due to the terrestrial nature of the raised bog habitat, the intervening distance and lack of any hydrological connectivity from the Site, there is no potential for indirect effects to this pNHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Waterstown Lake pNHA [001732]	7.1km from Wind Farm Site (8.8km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Development site. Due the intervening distance and nature of the Proposed Development there is no potential for indirect effects to terrestrial habitat of this pNHA.

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		The Proposed Development site is within a separate hydrological catchment to the pNHA, and no hydrological connectivity to the pNHA exists. Therefore, no pathway for indirect effects on the aquatic habitats of the pNHA exist. **The site is *outside* of the Likely Zone of Impact and no further assessment is required.**
Woodfield Bog pNHA [000586]	8.8km from Wind Farm Site (2km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. Due to the terrestrial nature of the raised bog habitat, the intervening distance and lack of any hydrological connectivity from the Site to the pNHA, there is no potential for indirect effects to this pNHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Lough Ree pNHA [000440] (*also designated as an SAC and SPA*)	9.1km from Wind Farm Site (10.8km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Developmental site. The Proposed Development site and the SAC are within the same hydrological sub catchment (Inny(Shannon)_SC_090). As watercourses are present within the Site, the construction phase of the Proposed Development may result in downstream pollution via the River Dungloman (IE_SH_26D060400) and the River Inny (IE_SH_26I011400). Therefore, the works have the potential, in the absence of mitigation, to impact on water quality, as identified for the SAC above. **This pNHA is *within* the Likely Zone of Impact; further assessment is required.**
Crosswood Bog pNHA [000678] (*also designated as an SAC*)	9.7km from Wind Farm Site (10.9km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. Due to the terrestrial nature of the raised bog habitat, the intervening distance and lack of any hydrological connectivity from the Site to the pNHA, there is no potential for indirect effects to this pNHA.

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Royal Canal pNHA [002103]	12.9km from Wind Farm Site (13.2km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Developmental site. Due the intervening distance and nature of the development there is no potential for indirect effects to terrestrial habitat of this pNHA. The Proposed Development site is within a separate hydrological sub-catchment to the pNHA, and no hydrological connectivity to the pNHA exists. Therefore, no pathway for indirect effects on the aquatic habitats of the pNHA exist. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Split Hills and Long Hill Esker pNHA [001831]	13.1km from Wind Farm Site (2.6km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Development site. Due to the terrestrial nature of the QI habitats and the intervening distance there is no potential for indirect effects to this pNHA. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Clara Bog pNHA [000572]	13.4km from Wind Farm Site (4.6km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct effects as the Proposed Development is located entirely outside of the designated site. Due to the terrestrial nature of the raised bog habitat, the intervening distance and lack of any hydrological connectivity from the Site to the pNHA, there is no potential for indirect effects to this pNHA. No potential pathway for significant effects on this designated site was identified. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
Derry Lough pNHA [001144]	14.2km from Wind Farm Site (17km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Development site. Due the intervening distance and nature of the Proposed Development there is no

Designated Site	Distance from Proposed Development (km)	Zone of Likely Impact Determination
		potential for indirect effects to terrestrial habitat of this pNHA. The Proposed Development site is within a separate hydrological catchment to the pNHA, and no hydrological connectivity to the pNHA exists. Therefore, no pathway for indirect effects on the aquatic habitats of the pNHA exist. **The site is *outside* the Likely Zone of Impact and no further assessment is required.**
River Shannon Callows pNHA [000216]	14.5km from Wind Farm Site (15.4km from Grid Connection underground electrical cabling route at its closest point)	There will be no direct impact on the pNHA as it is located outside of the footprint of the Proposed Developmental site. Due the intervening distance and nature of the development there is no potential for indirect effects to terrestrial habitat of this pNHA. Potential hydrological connectivity has been identified via watercourses crossing the Grid Connection underground electrical cabling route which ultimately flow to the pNHA. The potential for deterioration in water quality as a result of pollution during the construction and operational phases of the Proposed Development have been identified on a precautionary basis. **The site is *within* the Likely Zone of Impact; further assessment is required.**

6.6.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets were conducted prior to undertaking the multi-disciplinary walkover survey.

Available NPWS datasets were downloaded and overlain on the Proposed Development site. No polygon or point data contained within datasets was within the EIAR Site Boundary (see Figure 6-6).

Following a review of the Irish Semi-natural Grasslands Survey (ISGS) (2007-2012) (O'Neill, *et al,* 2013), no areas of the lands within the EIAR Site Boundary were found to have been surveyed as part of the ISGS.

Map Legend

- EIAR Site Boundary

Westmeath & Offaly Article 17 Habitats 2020

- Active Raised Bog
- Alkaline Fens
- Dry Heath
- Hydrophilous Tall Herb
- Lowland Hay Meadows
- Orchid Rich Calcareous Grassland
- Transition Mires

N

Drawing Title
Site in relation to mapped Article 17 Habitats

Project Title
Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
201050	Figure 6-6
Scale	Date
1:100,000	2023-03-07

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6.6.1.3 Vascular plants

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, The Irish Red Data Book - 1 Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km squares in which the Site is situated (N14 and N24D). Each hectad contains 100 whole one kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 6-7.

Table 6-7 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad N14, N24

Common Name	Scientific Name	Hectad	Status
Annual Bugloss	*Anchusa arvensis*	N14	NT
Green Winged Orchid	*Orchis morio*	N24	VU
Burr Chervil	*Anthriscus caucalis*	N14	NT
Meadow cranes-bill	*Geranium pratense*	N24	VU
Acute Sedge	*Carex acuta*	N14	NT
Fibrous tussock-sedge	*Carex appropinquata*	N14, N24	NT
Frog Orchid	*Coeloglossum viride*	N24	NT
Dwarf Spurge	*Euphorbia exigua*	N24	NT
Brown Beaksedge	*Rhynchospora fusca*	N14	NT
Bur-reed	*Sparganium natans*	N14	NT
Autumn Gentian	*Gentianella amarella*	N24	NT
Marsh Fern	*Thelypteris palustris*	N14	NT
Fly Orchid	*Ophrys insectifera*	N24	NT
Green field-speedwell	*Veronica agrestis*	N14	NT
Red Hemp Nettle	*Galeopsis angustifolia*	N24	FPO, VU

Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Regionally Extinct (RE), FPO(Flora Protection Order)

6.6.1.4 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2018) was also undertaken on 11/11/2020 with no protected bryophytes recorded within or adjacent to the Proposed Development site.

6.6.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted on the 10/11/2020. This helped to inform survey effort and provide a baseline of likely species composition in the area. Records of protected fauna recorded from hectads N14, N24 are provided in Table 6-8 and Table 6-9.

Table 6-8 NBDC records for species of conservation interest in hectads N14, N24

Common name	Scientific name	Designation	Hectad
Common Lizard	*Zootoca vivipara*	WA	N14,
Common Newt	*Lissotriton vulgaris*	WA	N14,
Common frog	*Rana temporaria*	Annex V, WA	N14, N24
Mrarsh Fritillary	*Euphydryas aurinia*	Annex II	N14,
White-clawed Crayfish	*Austropotamobius pallipes*	WA, Annex II, V	N14, N24
Pine Marten	*Martes martes*	WA, Annex V	N14, N24
Leisler's bat	*Nyctalus leisleri*	HD Annex IV, WA	N14,
Soprano pipistrelle	*Pipistrellus pygmaeus*	HD Annex IV, WA	N14, N24
Otter	*Lutra lutra*	HD Annex II, IV, WA	N14, N24
Badger	*Meles meles*	WA	N14, N24
Eurasian Red squirrel	*Scuirus vulgaris*	WA	N14, N24
Eurasian pygmy shrew	*Sorex minutus*	WA	N14, N24
European hedgehog	*Erinaceus europaeus*	WA	N14, N24

Annex II, Annex IV, Annex V – Of EU Habitats Directive, Annex I – Of EU Birds Directive, WA – Irish Wildlife Acts (1976-2017)

Table 6-9 NBDC records for Annex I, BoCCI RL – Birds of Conservation Concern Ireland Red List hectads N14, N24

Common name	Scientific name	Designation	Hectad
Meadow Pipit	*Anthus pratensis*	BoCCI RL	N14, N24
Kingfisher	*Alcedo atthis*	Annex I	N14, N24
Swift	*Apus apus*	BoCCI RL	N14, N24
Stock Dove	*Columba oenus*	BoCCI RL	N14, N24
Corncrake	*Crex crex*	Annex I, BoCCI RL	N14, N24
Yellowhammer	*Emberiza citrinella*	BoCCI RL	N14, N24
Kestrel	*Falco tinnunculus*	BoCCI RL	N14, N24
Snipe	*Gallinago gallinago*	BoCCI RL	N14, N24
Merlin	*Falco columbarius*	Annex I	N14, N24
Red Grouse	*Lagopus lagopus*	BoCCI RL	N14, N24
Grey Wagtail	*Motacilla cinerea*	BoCCI RL	N14, N24

Curlew	*Numenius arquata*	BoCCI RL	N14, N24
Golden Plover	*Pluvialis apricaria*	Annex I, BoCCI RL	N14, N24
Whinchat	*Saxicola rubetra*	BoCCI RL	N14, N24
Woodcock	*Scolopax rusticola*	BoCCI RL	N14, N24
Perigrine	*Falco perigrinus*	Annex I	N24
Redshank	*Tringa totanus*	BoCCI RL	N14, N24
Redwing	*Turdus iliacus*	BoCCI RL	N14, N24
Barn Owl	*Tyto alba*	BoCCI RL	N14
Lapwing	*Vanellus vanellus*	BoCCI RL	N14, N24
Whooper Swan	*Cygnus cygnus*	Annex 1	N14
Short Eared Owl	*Asio flammeus*	Annex 1	N14

6.6.1.6 Bat Records

6.6.1.6.1 Bat Conservation Ireland

A data request, for records within 1km and 10km radius of the EIAR Site Boundary (Grid Ref: N 19458 46151), was sent to Bat Conservation Ireland on 01/02/2023. Available bat records were provided by Bat Conservation Ireland on 09/02/2023. A number of observations have been recorded within 10km; one roosts, four transects and thirty-eight ad-hoc observations. At least six of Ireland's nine resident bat species were recorded within 10 km of the proposed works including Common and Soprano pipistrelle, Leisler's bat, Brown long-eared bat, Daubenton's bat and Natterer's bat. The results of the database search are provided in Table 6-10.

Table 6-10: National Bat Database of Ireland Records within 10km

Survey Type	Species	Grid reference	Date	Observer/Survey
Roost	Daubenton's bat, Natterer's bat and Soprano pipistrelle	N2748	N/A	-
Transect	Unidentified bat, Daubenton's bat	N2410052500	N/A	-
	Unidentified bat, Daubenton's bat	N1760052000	N/A	-
	Daubenton's bat	N2673337876	N/A	-
	Common pipistrelle, Soprano pipistrelle Pipistrellus spp. (45kHz/55kHz)	N2740039800	N/A	-
Ad-hoc	Unidentified bat, Leisler's bat, Daubenton's bat	N119551	24/08/2008	BATLAS 2010
	Unidentified bat, Soprano pipistrelle	N122508	16/09/2008	BATLAS 2010
	Common pipistrelle, Soprano pipistrelle	N275553	24/09/2009	BATLAS 2010
	Common pipistrelle, Soprano pipistrelle	N244522	24/09/2009	BATLAS 2010
	Common pipistrelle, Soprano pipistrelle	N234447	20/09/2009	BATLAS 2010
	Myotis spp. Common pipistrelle	N280491	20/09/2009	BATLAS 2010
	Soprano pipistrelle, Leisler's bat	N148421	09/10/2009	BATLAS 2010
	Soprano pipistrelle	N177465	09/10/2009	BATLAS 2010
	Unidentified bat, Leisler's bat	N193494	09/10/2009	BATLAS 2010
	Soprano pipistrelle	N282493	29/07/2009	BATLAS 2010

	Common pipistrelle, Soprano pipistrelle, Myotis spp.	N239436	29/07/2009	BATLAS 2010
	Unidentified bat	N170387	09/10/2009	BATLAS 2010
	Common pipistrelle, Leisler's bat, Daubenton's bat	N223359	01/10/2009	BATLAS 2010
	Soprano pipistrelle	N225363	01/10/2009	BATLAS 2010
	Leisler's bat, Brown Long-eared bat	N223367	01/10/2009	BATLAS 2010
	Soprano pipistrelle, Leisler's bat	N232396	01/10/2009	BATLAS 2010
	Leisler's bat	N1949037969	22/10/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle, Leisler's bat, Daubenton's bat	N2762638246	03/09/2017	BATLAS 2020
	Leisler's bat	N1745138332	22/10/2018	BATLAS 2020
	Soprano pipistrelle	N2802440176	15/05/2018	BATLAS 2020
	Common pipistrelle	N2841642767	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle, Myotis spp., Pipistrellus spp.	N2395844146	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle	N2357444627	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle, Pipistrellus spp.	N2298845883	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle, Leisler's bat, Myotis spp., Pipistrellus spp.	N2240950015	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle	N1887750560	18/10/2015	BATLAS 2020
	Common pipistrelle	N2305450727	15/05/2018	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle	N1190950877	13/10/2015	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle	N1765652060	18/10/2015	BATLAS 2020
	Common pipistrelle, Leisler's bat	N2430752512	15/05/2018	BATLAS 2020
	Soprano pipistrelle	N1179953534	13/10/2015	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle	N1916053773	18/10/2015	BATLAS 2020
	Soprano pipistrelle	N1292054638	13/10/2015	BATLAS 2020
	Common pipistrelle, Soprano pipistrelle, Leisler's bat	N1189255036	01/06/2016	BATLAS 2020
	Daubenton's bat	N1189255036		BATLAS 2020
	Common pipistrelle, Leisler's bat, Unidentified bat	N2762455253		BATLAS 2020
	Soprano pipistrelle, Brown Long-eared bat	N1948755424		BATLAS 2020
	Soprano pipistrelle	N1415037500		Consultancy Surveys

6.6.1.6.2 National Bat Database of Ireland

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km radius of the Wind Farm Site (IG Ref: N 19458 46151; last search 17/01/2023). The search yielded one results of roosts within a 2km radius of the EIAR Site Boundary. The search was extended to include a 10km radius including roosts, transects and ad-hoc observations. A number of ad-hoc observations (n=10) have been recorded. At least three of Ireland's nine resident bat species were recorded within 10 km of the Wind Farm Site including common and soprano pipistrelle, and Leisler's bat as well as several records of unidentified bats. The results of the database search are provided in Table 6-11.

Table 6-11 National Bat Database of Ireland Records within 10km

Record	Species	Grid Reference	Date	Location
Roost	*Pipistrellus pygmaeus*	N177465	09/10/2009	BATLAS 2010
	Pipistrellus pygmaeus; Nyctalus leisleri	N148421	09/10/2009	BATLAS 2010
Ad-Hoc	*Pipistrellus pygmaeus*	N177465	09/10/2009	BATLAS 2010
	Nyctalus leisleri	N193494	09/10/2009	BATLAS 2010
	Pipistrellus pipistrellus sensu lato; Pipistrellus pygmaeus	N239436	29/07/2009	BATLAS 2010

Record	Species	Grid Reference	Date	Location
	Pipistrellus pipistrellus sensu lato; Pipistrellus pygmaeus	N234447	20/09/2009	BATLAS 2010
	Pipistrellus pipistrellus sensu lato	N280491	20/09/2009	BATLAS 2020
	Pipistrellus pygmaeus	N282493	29/07/2009	BATLAS 2020

6.6.1.6.3 Bat Species Range

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2019 Article 17 Reports (NWPS, 2019) were reviewed in relation to the location of the Proposed Development.

The EIAR Site Boundary is located outside the current known range for Whiskered bat (*Myotis mystacinus*) and Lesser horseshoe bat (*Rhinolophus hipposideros*). The south-eastern section of the Wind Farm Site is located within the current known range for Nathusius' pipistrelle (*Pipistrellus nathusii*). The site is within range for all other bat species.

6.6.1.7 NPWS Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads N14 and N24. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 16th of December 2022. A response was received on the 20th December 2022. Table 6-12 lists rare and protected species records obtained from NPWS.

Table 6-12 NPWS records for rare and protected species

Common name	Scientific name	Designation	Hectad
Round-leaved Wintergreen	*Pyrola rotundifolia subsp. rotundifolia*	FPO	N24
Eurasian Otter	*Lutra lutra*	HD Annex IV, WA	N14 & N24
Eurasian Badger	*Meles meles*	HD Annex IV, WA	N24 & N14
Irish Hare	*Lepus timidus subsp. hibernicus*	WA	N14 & N24
Common Frog	*Rana temporaria*	HD Annex IV, WA	N24 & N14
White-clawed Crayfish	*Austropotamobius pallipes*	WA	N14 & N24
Pine Marten	*Martes martes*	Annex V, WA	N14
Marsh Fern	*Thelypteris palustris*	NT	N14
Red-neck Forklet-moss	*Dicranella cerviculata*	NT	N14
West-European Hedgehog	*Erinaceus europaeus*	WA	N14
Cladonia ciliata	*Cladonia ciliata*	Annex V	N14 & N24
Cladonia portentosa	*Cladonia portentosa*	Annex V	N14 & N24
Red Hemp-nettle	*Galeopsis angustifolia*	FPO	N24

Common name	Scientific name	Designation	Hectad
Green-winged Orchid	*Orchis morio*	VU	N24

FPO = Flora Protection Order; VU = Vulnerable, NT-=Near Threatened, WA = Wildlife Act

6.6.1.8 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. Freshwater pearl mussels are not present within the Proposed Development site. There is no hydrological connectivity between the Proposed Development site and recorded Freshwater pearl mussel sensitive areas. The surface water connectivity from the Proposed Development site, does not flow through any registered sensitive area. There is no groundwater connectivity between registered freshwater peal mussel sensitive areas and the Proposed Development site, as the Site is not located within the same sub-catchment as any registered sensitive area for freshwater pearl mussel.

6.6.1.9 Inland Fisheries Ireland Data

The Dungolman_030 river is located within the Proposed Development site however no IFI information was available for this river. The nearest river with information available was located and used for the purpose of this assessment. The Proposed Development site drains into the Brosna_100 River. A search of the Inland Fisheries Ireland (IFI) online database was carried out to determine the species richness of the River Brosna (IE_SH_25B091000). The results are presented in Table 6-13.

Table 6-13 IFI data and associated Q values

Station Name	Species	Q Status	Assessment Year
River Brosna	Brown trout, European eel, Gudgeon, Lamprey sp., Minnow, Perch, Pike, Roach, Stone loach, 3-spined stickleback	Poor (near Mullingar), Moderate (South of Lough Ennell), Good (near Ferbane)[17]	2014
River Brosna (Clonony)	Brown trout, Roach, Perch, Gudgeon, Pike, Salmon, Bream, Stone loach, Eel, Minnow	Poor (near Mullingar), Moderate (South of Lough Ennell), Good (near Ferbane)	2008

[17] *JBA Consulting (2018): Office of Public Works Drainage Maintenance Works-Brosna Arterial Drainage Scheme 2019-2923*

6.6.1.10 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectads. Records of 'high impact' invasive species for hectads N14 and N24 are provided in Table 6-14.

Table 6-14 NBDC records for invasive species (hectads N14, N24)

Common Name	Scientific Name	Hectad
Japanese Knotweed	*Fallopia japonica*	N14, N24
Rhododendron	*Rhododendron ponticum*	N14
American Mink	*Mustela vison*	N14
Eastern Grey Squirrel	*Sciurus carolinensis*	N14, N24

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the introduction, dispersal, dealing in and keeping of non-native species. Japanese knotweed (*fallopian japonica*), Indian Balsam (*Impatiens glandulifera*), Himalayan knotweed (*Persicaria wallichii*), New Zealand Pigmyweed (*Crassula helmsii*) and Rhododendron (*rhododendron ponticum*) are species subject to restrictions under Regulations 49 and 50 and are included in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

6.6.1.11 Baseline Hydrology

6.6.1.11.1 *Wind Farm Site*

On a regional scale, the Wind Farm Site is located in the Inny River surface water sub-catchment, which is in the Upper Shannon catchment within Hydrometric Area 26 of the Irish River Basin District (SIRBD). The Inny River flows to the northwest approximately 8.2km northwest of the Wind Farm Site. The Inny River discharges into Lough Ree approximately 10.6km northwest of the Wind Farm Site. A regional hydrology map is shown as Figure 9-1 within Chapter 9 of this EIAR.

On a more local scale, the Wind Farm Site is located in the Inny River sub-catchment (Inny[Shannon]_SC_090) with the majority of the Wind Farm Site located in the Dungolman WFD river sub basin (Dungolman_030) (refer to Figure 9-2 within Chapter 9 of this EIAR.). A small section in the southwest of the Wind Farm Site is mapped in the Dungolman_020 river sub-basin while the northwestern corner of the Wind Farm Site is located in the Inny River (Inny_110) river sub-basin. However, none of the proposed turbines are mapped in the Dungolman_020 or Inny_110 river sub-basins.

As stated above, the majority of the Wind Farm Site is located in the Dungolman_030 river sub-basin. The Dungolman River (EPA Coe: 26d06) flows to the northeast between T4 and T5. This watercourse then flows along the EIAR Site Boundary to the east of T2 and T3 before veering to the northeast to the east of T1. Drainage in this river sub-basin is directed towards the Dungolman River via several smaller streams and drains. The Dungolman River continues to flow to the north before discharging into the Tang River (EPA Code: 26T02) approximately 5.15km north of the Wind Farm Site. The Tang River continues to flow northwest and eventually discharges into the Inny River (EPA Code: 26I01) approximately 8.3km northwest of the Wind Farm Site. The Inny River drains into the eastern side of Lough Ree.

Within the Dungolman_020 River sub-basin, the southwest of the Wind Farm Site drains towards the Dungolman River via the Toorbeg stream (EPA Code: 26T25). Meanwhile within the Inny_110 River sub-basin, the northwest of the Wind Farm Site drains to the northwest via the Ardnacrany south stream (EPA Code: 26A50) which discharges into the Dungolman River approximately 4.3km north of the Wind Farm Site.

A map of the local hydrology in relation to the Wind Farm Site is shown in Figure 9-2, Chapter 9 'Water' of this EIAR.

6.6.1.11.2 Grid Connection

The Grid Connection onsite 110kV substation and associated construction compound are located within the Wind Farm Site which is detailed above.

The Grid Connection underground electrical cabling route is located within the Upper Shannon catchment (26) and Lower Shannon catchment (25A) of the Irish River basin district. A Grid Connection hydrology map is shown in Figure 9-3, Chapter 9 'Water' of this EIAR.

The Grid Connection underground electrical cabling route is located within the Inny (Shannon) SC_090, the Brosna_SC_030, Brosna_SC_020, Silver[Tullamore]_SC_010 and Tullamore_SC_010 subcatchments. Apart from the Inny (Shannon) SC_090 subcatchment, all the associated subcatchment rivers flow generally southwest towards the Lower Shannon catchment. The primary watercourse within this Lower Shannon catchment (of the underground electrical cabling route) is the River Brosna. The Silver River and Tullamore River drain into the River Brosna.

6.6.1.11.3 Water Quality

Q-rating status data for EPA monitoring points on the Dungolman River, Mullenmeehan stream and the Inny River are shown on Table 6-15 below. The Q-Rating is a water quality rating system based on both the habitat and the invertebrate community assessment and is divided into status categories ranging from 0-1 (Poor) to 4-5 (Good/High). The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

Most recent data available (2005 to 2020) show that the Q-rating for the Dungolman River upstream of the Wind Farm Site at the bridge west of Umma House is of Poor status. Meanwhile, upstream of the Wind Farm Site, the Mullenmeehan stream is reported to be of Moderate status in the latest monitoring round (2020). Downstream of the site the Dungolman and Inny Rivers are both reported as being of Good status. No Q-rating is available for the Moneynamanagh stream located on the south of the Wind Farm Site.

Table 6-15: Watercourses on site with relevant water quality statuses

Waterbody	EPA Location Description	Year	Easting	Northing	EPA Q-Rating Status
Dungolman_020	Bridge West of Umma House	2020	218,660	245,466	Poor
Mullenmeehan Stream	Bridge near Mullenineehan	2020	221,427	246,572	Moderate
Dungolman_030	Bridge SE of Lecade	2020	217,655	252,059	Good
Inny_110	Red Bridge	2005	211,930	255,015	Good

6.6.1.12 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in hectads N14 and N24, within which the Proposed Development site is located. The Wind Farm Site is located in the Upper Shannon catchment (Upper Shannon_26F) and is within the Inny River sub-catchment (Inny[Shannon]_SC_090). Sections of the Dungolman_030 watercourse occur within the Wind Farm Site which drains into the Inny River to the north.

A number of watercourses that drain the Proposed Development site, ultimately lead to the following downstream EU Designated Sites, and are further considered in the Natura Impact Statement prepared for the Proposed Development:

- Lough Ree SAC [000440]
- Lough Ree SPA [004064]
- River Shannon Callows SAC [000216]
- Middle Shannon Callows SPA [004096]

The desk study identified that a variety of protected faunal species are known to occur within the Proposed Development site, including bats, otter, pine marten and badger. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits.

Similarly, to the European Sites listed above, the following nationally designated sites have been identified as having potential hydrological connectivity to the Proposed Development site, and are considered within the impact assessment in Section 6.7:

- Lough Ree pNHA
- River Shannon Callows pNHA

The desk study identified that a variety of protected faunal species are known to occur within the survey area, including bats, otter and badger. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009[18]). No records of marsh fritillary occur within the Site. The Site is not located within a freshwater pearl mussel 'sensitive area' or area with previous records of the species. The desk study also provided useful information to inform the ecological surveys undertaken on the Site as well as the identification of pathways for potential impact on sensitive ecological receptors.

6.6.2 Ecological Walkover Survey Results

This section provides a description of habitats and flora with the Proposed Development Ecological Survey Area and is categorised into the following:

- Wind Farm Site
- Grid Connection.

[18] *Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.*

6.6.2.1 Description of Habitats and Flora within the Wind Farm Site Ecological Survey Area

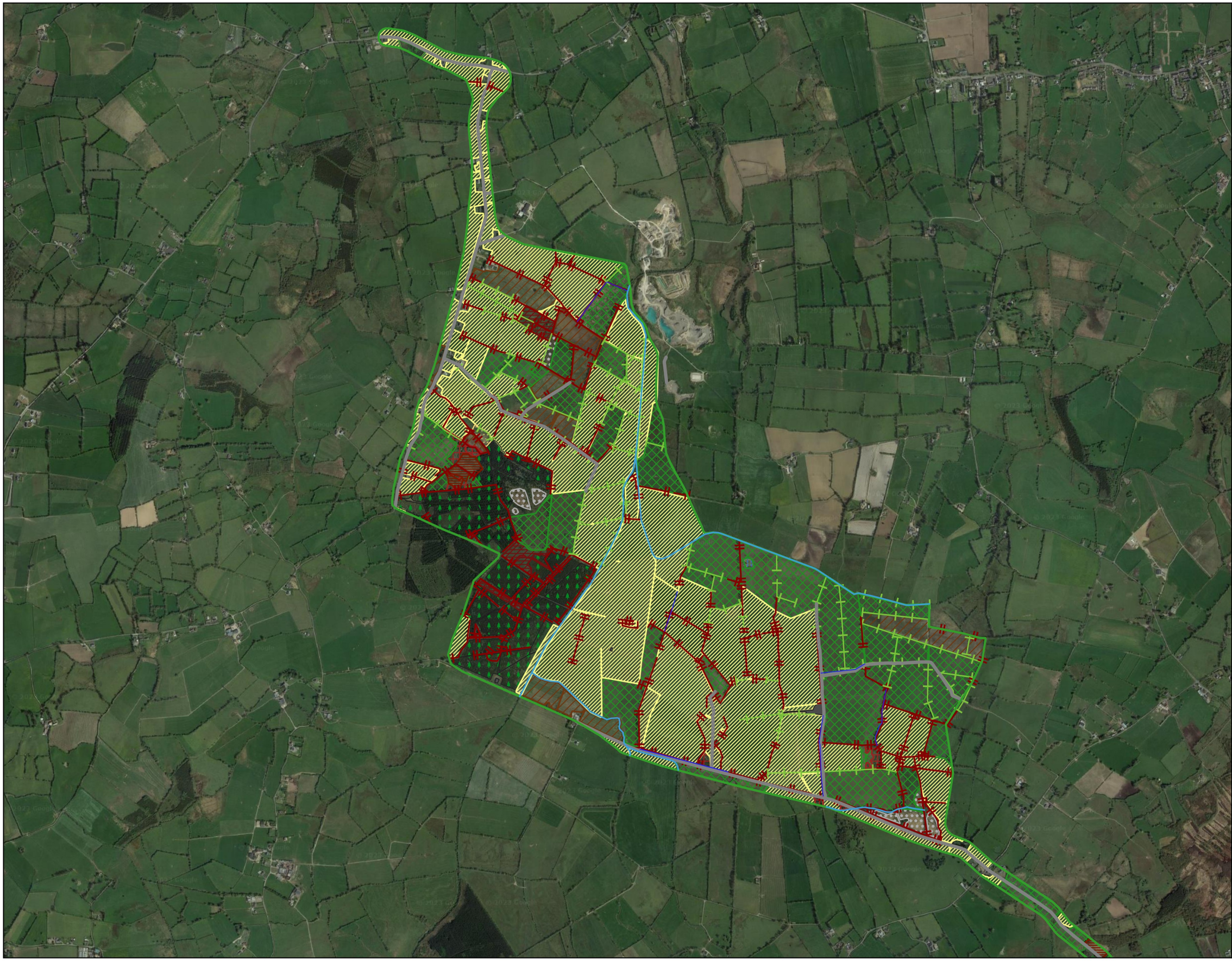
A total of eleven habitats were recorded within the Wind Farm Site and the extended Ecological Survey Area (see Figure 6-7), including;

- Improved agricultural grassland (GA1)
- Wet grassland (GS4)
- Scrub (WS1)
- Arable land (BC1)
- Conifer Plantation (WD4)
- Drainage Ditches (FW4)
- Hedgerows (WL1)
- Treelines (WL2)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Buildings and Artificial Surfaces (BL3)

Grassland habitats have been categorised to plant communities following the Irish Vegetation Classification (IVC). Detailed botanical data from relevés recorded in grassland habitats are provided in Appendix 6-1 of this EIAR. Habitat maps of the Wind Farm Site are provided in Figures 6-7 and 6-8.

6.6.2.1.1 *Improved Agricultural Grassland (GA1)*

The majority of the lands within the Wind Farm Site comprise Improved agricultural grassland (GA1) pasture. The sward within most fields of this nature was dominated by perennial rye grass (*Lolium perenne*), and Italian ryegrass (*Lolium multiflorum*), with Yorkshire fog (*Holcus lanatus*), cock's foot (*Dactylus glomerata*) couch (*Elytrigia repens*) and Timothy (*Phleum pratense*) grasses also recorded at field margins where grass had grown longer. Much of the grassland was very species-poor, and comprised almost exclusively ryegrass species; however herb species typical of agricultural grassland were also present to varying degrees, and included white clover (*Trifolium repens*), creeping buttercup (*Ranunculus repens*), broadleaf dock (*Rumex obtusifolius*), common sorrel *(Rumex acetosa),* thistle spp. (*Cirsium* spp.), daisy (*Bellis perennis*) and red clover (*Trifolium pratense*). These areas of grassland are under agricultural management and heavily grazed by livestock. In some areas, the improved agricultural grassland habitat graded into wet grassland (see below). The majority of turbines and associated infrastructure are located within improved agricultural grassland habitat.



Drawing Title

Habitat Map

Project Title	
Umma More Renewable Energy Development	
Drawn By: PE	Checked By: JH
Project No.: 201050	Drawing No.: Figure 6-7
Scale: 1:19000	Date: 2023-01-24

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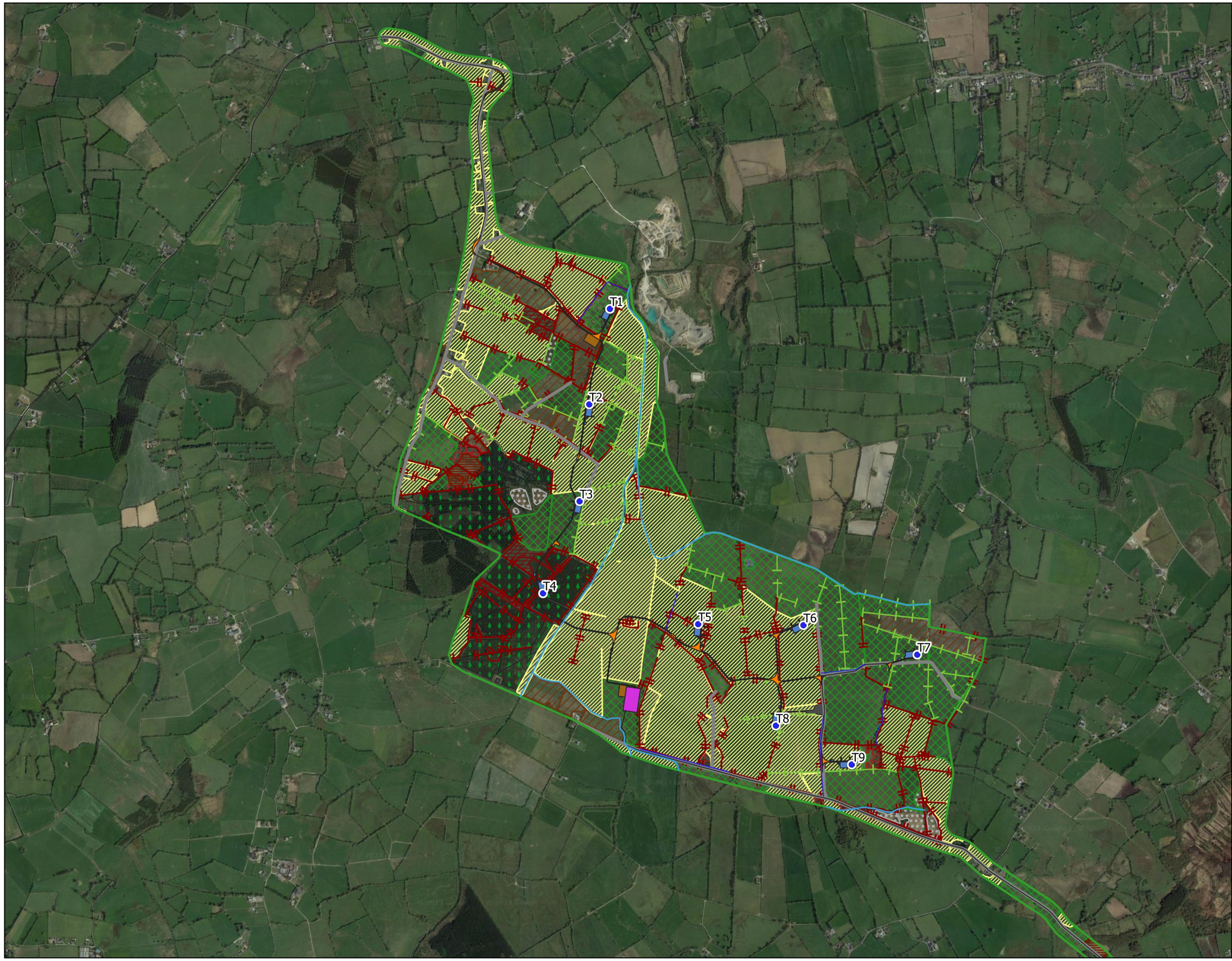

Map Legend

- EIAR Site Boundary

Polygon Habitats

- Arable crops
- Tilled land
- Buildings and artificial surfac
- Spoil and bare ground
- Recolonising bare ground
- Improved agricultural grassland
- Wet grassland
- Conifer plantation
- Oak-birch-holly woodland
- Oak-ash-hazel woodland
- Scrub
- Immature woodland
- Depositing/ Lowland Rivers
- Drainage Ditches
- Hedgerows
- Treelines
- Proposed Grid Connection V6
- Proposed Hardstands
- Proposed Met Mast
- Proposed New Roads
- Proposed Onsite Substation
- Proposed Temporary Construction Compounds
- Proposed Turbine Delivery Route
- Proposed Turbine Foundation
- Proposed Turbine Layout
- Proposed Upgrades to Existing Roads

Drawing Title: Habitat Map with Proposed Wind Farm Site overlain

Project Title: Umma More Renewable Energy Development

Drawn By	Checked By
PE	JH
Project No.	Drawing No.
201050	Figure 6-8
Scale	Date
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Plate 6-1:Species-poor Improved agricultural grassland (GA1) within the southern portion of the Wind Farm Site, this habitat is typical of the majority of the grassland within the Wind Farm Site. In the background, grass is growing longer at the field margins, and hedgerow forms the field boundary.

Plate 6-2; Improved agricultural grassland (GA1) in the central part of the Wind Farm Site.

6.6.2.1.2 Wet Grassland (GS4)

Areas of wet grassland were recorded within fields and in some cases comprised entire fields in poorly draining parts of the Wind Farm Site. These areas were characterised by abundant cover of soft rush (*Juncus effusus*) and hard rush *(Juncus inflexus),* in addition to other species listed above.

The rush dominated wet grassland was also characterised by an abundance of species such as Yorkshire fog grass, (*Jacobaea vulgaris*), silverweed (*Potentilla anserina*), creeping Buttercup and marsh thistle *(Cirsium arvense).* In some areas salad burnet (*Sanguisorba minor*), common knapweed (*Centaurea nigra*), common sorrel, creeping fecue (*Festuca rubra*), marsh woundwort (*Stachys palustris*), common bird's foot trefoil (*Lotus corniculatus*), self-heal (*Prunella vulgaris*) and common field speedwell (*Veronica persica*) were also recorded. Some of these areas grazed by cattle had evidence of poaching due to the wet ground conditions. This habitat occurred adjacent to improved agricultural grassland (GA1) in many fields (see Plate 6-3). Other wetter fields were recorded where abundant yellow flag iris (*Iris pseudacorus*) and meadowsweet (*Filipendula ulmaria*) were the characteristic species (see Plate 6-4).

Plate 6- 1 Area of Wet grassland (GS4) adjacent to Improved agricultural grassland (GA1)

Plate 6-3: Wet area of field within the central part of the Wind Farm Site characterised by abundant yellow flag iris and meadowsweet.

6.6.2.1.3 Dry Meadows and Grassy Verges (GS2)

Some areas of grassland within the Wind Farm Site, mostly associated with field edges had been allowed to grow rank and were not actively managed at the time of the surveys. These areas were characterised by species such as Yorkshire fog, creeping bent (*Agrostis stolonifera*), cock's foot grass, Timothy grass.

Unmanaged dry meadow and grassy verge habitat was also recorded within the central southern area of the Wind Farm Site, in the lands associated with a derelict property. These areas were characterised by an abundance of dock, and ragwort, with frequent creeping buttercup, white clover, ribwort plantain (*Plantago lanceolata*), creeping thistle, silverweed and occasional red bartsia (*Odontites vernus*).

Areas of tall ruderal vegetation was present associated with these areas within the Wind Farm Site including species such as common nettle, ragwort, cleavers (*Galium aparine*), hogweed (*Heracleum sphondylium*) and willowherb (*Epilobium*) spp., with tufted vetch (*Vicia cracca*), meadowsweet, sow thistle (*Sonchus arvensis*), rosebay willowherb (*Chamaenerion angustifolium*), In wetter areas star sedge (*Carex echinate*), purple loosestrife (*Lythrum salicaria*) and meadowsweet were regularly recorded.

6.6.2.1.4 Conifer Plantation (WD4)

An area of **Conifer planation (WD4)** forestry habitat is present within the western area of the Wind Farm Site. The conifer plantation within the Wind Farm Site represented primarily post thicket semi-mature plantation forestry. These forestry blocks were dominated by Sitka Spruce (*Picea sitchensis*). Very little ground flora was present in densely planted areas, with moss spp. and horsetails (*Equisetum arvense*) occasional dewberry (*Rubus caesius*). Where areas of conifer plantation had been felled but not yet replanted, this was classified as Recently-felled woodland **(WC4)**.

Along the edges of stands of conifer and within firebreaks these are lined with mature broadleaf tree lines comprised primarily of ash (*Fraxinus excelsior)*. The trunks of many of these trees were covered in dense ivy (*Hedera helix*). Young alder (*Alnus glutinosa*) trees were also regenerating in these areas, and the ground flora comprised species such as Yorkshire fog, sweet vernal grass, pendulous sedge (Carex pendula), Timothy (*Phleum pratense*), cock's foot, creeping bent (*Agrostis stolonifera*), creeping red fescue (*Festuca rubra*), lesser stitchwort (*Stellaria graminea*), yellow flag iris and patches of bramble.

Plate 6-4: Example of Conifer Plantation (WD4) habitat within the western area of the Wind Farm Site.

Plate 6-5: Example of limited ground flora present within the conifer plantation habitat.

Plate 6-6: Example of mature broadleaf tree line at edge of conifer plantation habitat.

6.6.2.1.5 Scrub (WS1)

A number of small areas of scrub were recorded within the Wind Farm Site. These areas occurred as patches of scrub within fields and encroaching into fields from hedgerow, with goat willow abundant in wetter areas. Patches of scrub associated with more open areas comprised predominately of gorse (*Ulex europaeus*). Patches of hawthorn scrub were present in places within conifer plantation.

6.6.2.1.6 Short Rotation Coppice (WS4) / Immature Woodland (WS2)

In some discrete areas of the Site, small stands of immature willow spp. were present that had apparently been managed through coppicing; these were categorised as Short Rotation Coppice (WS4); where discrete stands on immature planted trees that had not been coppiced such as birch spp. were recorded, these were classified as areas of Immature Woodland (WS2).

Plate 6-7: Area of Short Rotation Coppice (WS4) within the western area of the Site.

Plate 6-8: Dense Scrub (WS1) associated with field edges and adjacent to conifer plantation

6.6.2.1.7 Hedgerow (WL1)

An extensive network of hedgerow occurs within the Wind Farm Site and formed the boundaries to the agricultural fields, the majority of which had Drainage ditches (FW4) also associated with them (see below). Hedgerows that made up the field boundaries comprised primarily hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*), with standard ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*) trees at intervals. Hazel (*Corylus avellana*), elder (*Sambucus nigra*), goat willow (*Salix caprea*), guelder rose (*Viburnum opulus*) spindle (*Euonymus europaeus*), dog rose (*Rosa canina*) and gorse were also recorded within hedgerow in parts of the Wind Farm Site.

Ground flora commonly associated with the hedgerows within the Wind Farm Site included bramble, dewberry, creeping thistle, hogweed, horsetail, great willowherb (*Epilobium hirsutum*), marsh woundwort, cuckooflower, silverweed and mosses including *Rhytidiadelphus squarrosus* and *Thuidium tamariscinum.*

6.6.2.1.8 Treeline (WL2)

Where linear 'hedgerow' features were over 5m in height and were made up of semi-mature trees, these were characterised as treelines, with ash, sycamore and beech (*Fagus sylvatica*) making up the majority of the tree cover within treelines within the Site, with often with an understory of unmanaged hawthorn, elder, ivy and bramble cover.

Mature broadleaf treelines were also recorded along the edges of stands of conifer plantation forestry and within firebreaks; these were comprised primarily of ash (*Fraxinus excelsior)* exceeding 20m in height. The trunks of many of these trees were covered in dense ivy. Other tree species frequently recorded in these areas were alder and sycamore.

Plate 6-9: Ash treeline making up a field boundary within the central area of the Wind Farm Site.

6.6.2.1.9 Drainage Ditches

An extensive network of drainage ditches is present within the Wind Farm Site, the majority associated with field boundary hedgerows. Where these hedgerows are well established, there was comparatively little in-channel vegetation associated with the ditches; here ivy and hart's tongue fern (*Asplenium scolopendrium*) were abundant with often dense bramble (see Plate 6-8). In places these ditches were muddy and heavily poached by livestock where there was a suitable access point nearby (see Plate 6-9).

Where wet ditches occurred in more open habitat a variety of semi-aquatic and aquatic species were recorded including meadowsweet, water mint (*Mentha aquatica),* yellow flag iris, bush vetch (*Vicia sepium*), tufted vetch, silverweed, square stalked Saint-John's wort (*Hypericum tetrapterum*), branched bur reed (*Sparganium erectum*), fool's watercress (*Apium nodiflorum*) and brooklime (*Veronica beccabunga*) see Plate 6.10). Some ditches, for example along the existing south-eastern access road within the Wind Farm Site, were choked with dense horsetail (see Plate 6.11).

Plate 6-10: Wet ditch within established hedgerow

Plate 6-11: Heavily poached section of drainage ditch within long established hedgerow.

Plate 6-12: Wet ditch within the eastern part of the Wind Farm Site; a lack of hedgerow has allowed in-channel vegetation to establish.

Plate 6-13: Drainage ditch along existing access road in the south-eastern part of the Wind Farm Site choked with dense horsetail.

6.6.2.1.10 *Spoil and bare ground (ED2)*

The existing unpaved tracks and roadways within the Wind Farm Site have been classified as spoil and bare ground (ED2). This includes primarily farm tracks to allow vehicle and machinery access to fields; no access tracks are present within the forestry. Species recorded starting to take hold on some bare ground areas included Autumn hawkbit (*Scorzoneroides autumnalis*), broad leaved plantain (Plantago major), Timothy grass, creeping thistle, horsetail, pineappleweed (*Matricaria discoidea*), ribwort plantain and sow thistle.

Plate 6-14: Areas of disturbed bare ground and farm tracks that were not gravelled or hardstand were classified as Spoil and bare ground.

Plate 6-15: Area classified as Spoil and bare ground in the central northern area of the Wind Farm Site.

6.6.2.1.11 Recolonising bare ground (ED3)

A number of areas where ground disturbance has been undertaken in the recent past have begun to recolonise, see Plate 6-14. These areas are small in area and occur as part of a mosaic with other habitat as such, have not been mapped in detail.

Plate 6-16: Patch of recolonising bare ground within grassland field within the northern part of the Wind Farm Site.

6.6.2.1.12 Depositing Lowland Rivers (FW2)

A number of watercourses cross the Wind Farm Site which flow to the west along the northern and southern boundaries of the eastern portion of the Wind Farm Site before converging within the western portion of the Wind Farm Site and flowing towards the north of the Site, bisecting the Wind Farm Site (see Figure 6-7). These watercourses are classified as Depositing Lowland Rivers (FW2). Most are approximately two to four metres in width, and are generally characterised by a bottom substrate of bedrock, small cobbles and small and large gravels, although some had muddy substrate.

Additional details of representative watercourses within the Wind Farm Site is provided in Chapter 9 of the EIAR: Water.

Plate 6-17: Section of flowing watercourse associated with the northern Wind Farm Site boundary, classified as Depositing lowland river (FW2).

6.6.2.1.13 Buildings and Artificial Surfaces (BL3)

Farm buildings within the Wind Farm Site comprise of agricultural sheds, ruined farm outbuildings and a derelict property in the southern central part of the Wind Farm Site. These were categorised as Buildings and artificial surfaces (BL3), see Plate 6-16. Hardstanding areas and roads within the Wind Farm Site were also classified as BL3.

Plate 6-18: Agricultural sheds and hardstanding areas within the centre of the eastern portion of the Wind Farm Site, classified as Buildings and artificial surfaces.

Plate 6-19: Derelict property (Umma House) within the central part of the Wind Farm Site. Bat surveys undertaken at the Wind Farm Site confirmed that the building was used as a roost by bats.

6.6.2.1.14 Habitats on the Turbine Delivery Route

It is proposed that large wind turbine components will be delivered to the site of the Proposed Development, from Galway Port, via the M6 National Road (other ports such as Shannon Port or Dublin Port could also be used). The proposed turbine transport route from the M6 National Road to the Wind Farm Site via the N6, N55 and R390. From the N6, the turbines will be transported northeast along the N55 for approximately 2.7km, before turning east onto the R390 Regional Road. The route continues along the R390 Regional Road for 13.5km before turning south onto the L5363 local road where the route continues south along this road for approximately 1km before turning east into the Wind Farm Site entrance. These will be limited to temporary measures including temporary local road widening, overruns of roundabout island and temporary relocation of some signs and street furniture (see Section 4.4.2.2, Chapter 4 of this EIAR).

Construction materials such as concrete, steel and construction materials will follow the same transport route as the wind turbines from the National Road network to the Wind Farm Site, along with additional routes which are as follows: M6 from the east, N55 from the south and the R390 from the east.

Accommodation works will be required at various locations on the national and regional road network between the port of arrival in Galway and the Wind Farm Site. These will be limited to temporary measures including temporary local road widening, overruns of roundabout island and temporary relocation of some signs and street furniture, with no loss of habitat associated with these. Within the Wind Farm Site, the route will necessitate sections of new access road in two locations to accommodate wind turbine vehicles; these cross areas of **Improved agricultural grassland (GA1)** and **Hedgerow (WL1) as described above.**

Further details on the Proposed Development access arrangements, and transport routes are outlined as part of the traffic and transport assessment in Section 14.1 of this EIAR.

6.6.2.2 Habitats along the Grid Connection

The Grid Connection onsite substation and temporary construction compound are located within the Wind Farm Site, and are located on lands made up of wet grassland, as detailed in Section 6.5.2.1.2 above. The Grid Connection underground electrical cabling route is approximately 31km in length and will run from the proposed onsite 110kV substation to the existing 110kV Thornsberry substation property. The route of the Grid Connection underground cabling route is described in Section 4.3.2.4, Chapter 4 of this EIAR.

The majority of the lands on either side of the road along the length of the Grid Connection underground electrical cabling route is made up of improved agricultural grassland, with associated Stonewalls and other stonework (BL1), hedgerow (WL1) Treelines (WL2), spoil and bare ground (ED2), associated buildings with depositing lowland rivers (FW2) and drainage ditches (FW4) crossing the underground electrical cabling route.

Plate 6-20: Example of a section of the existing Tinnycross Road in which part of the underground electrical cabling route is to be located, categorised as Buildings and artificial surfaces (BL3), with associate road verge, scrub and hedgerow.

A number of watercourses (classified as Depositing lowland rivers (FW4)) occur along the underground electrical cabling route. There are a total of 34 identified watercourse and existing culvert crossings along the underground electrical cabling route, of which 11 no. are EPA/OSI mapped crossings. The remaining crossings are classified as culverts over minor channels or manmade drains. Watercourses were generally slow flowing with a cobble or muddy substrate, see Plate 6-19. The construction methodology for the 11 no. EPA/OSI mapped crossings has been designed to eliminate the requirement for in-stream works on these locations requiring a crossing to be constructed to traverse the watercourse with the cabling ducts. A general description of the various construction methods employed at watercourse/ culvert/ drain crossings are described in Section 4.7.7.4, Chapter 4 of this EIAR.

Plate 6-21: Example photo of an existing watercourse crossing occurring on the underground electrical cabling route (Watercourse ref. WC6).

Plate 6-22: Example of roadway along the turbine delivery route, classified as buildings and artificial (BL3), with adjacent Hedgerow (WL1) and Spoil and bare ground (ED2)

6.6.2.2.1 *Protected Flora*

No botanical species listed under the Flora (protection) Order (as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the Proposed Development site. The species recorded are generally common in the Irish landscape.

6.6.2.2.2 *Invasive species*

There were no Third Schedule non-native species encountered within the Proposed Development site during the ecological surveys.

6.6.2.3 Fauna in the Existing Environment

The following subsections provide a breakdown of the species recorded during the site visits and assessments.

6.6.2.3.1 *Badger*

Three badger setts were recorded within the Proposed Development site, all comprising of a single entrance. Two of these were classified as *outlier* setts, whilst the third was classified as a subsidiary sett due to activity levels (as per Smal, (1995)[19]). Outlier setts showed signs of intermittent use by badgers during monitoring using sticks placed in the entrance of setts. The location of the badger setts are provided in Confidential Appendix 6-5[20]. One of the outlier setts identified is located within conifer plantation habitat, within close proximity to the initially proposed site access road leading to T4 within the Wind Farm Site (see Plate 6-21). The proposed site access road was subsequently altered during the iterative design process to avoid any potential for any direct destruction/disturbance to the sett.

Evidence of badger recorded within the Wind Farm Site is shown in Figure 6-9.

[19] *Smal, C. (1995) The Badger and Habitat Survey of Ireland. Unpublished Report to the Department of Agriculture and the National Parks & Wildlife Service.*
[20] *Following standard best practice, the location of breeding or resting places of protected species should be provided as a confidential appendix for review by the competent authority and not made available to the public in order to avoid potential for persecution.*

Plate 6-23: Badger sett entrance recorded within conifer plantation forestry habitat within the western part of the Wind Farm Site.

Plate 6-24: Location of active subsidiary sett (within dense nettle cover) within the grounds of the derelict property in the southern central part of the Wind Farm Site.

6.6.2.3.2 *Otter*

Watercourses within the Wind Farm Site provide suitable habitat for otter, and evidence of the species was recorded in the form of spraint and feeding remains at a single location within the Wind Farm Site, where a concentration of spraint and feeding remains was recorded in the south-western area of the Wind Farm Site, just downstream of where the Moneynamanagh [26M40] watercourse meets the Dungolman [26D06] watercourse (see Plate 6-23). The prey remains found in this location during August 2022 were almost exclusively made up of white-clawed crayfish. No evidence of otter was recorded along watercourses where the Grid Connection underground electrical cabling route crossings are proposed.

No otter holts or other resting places were recorded during any of the ecological surveys.

Evidence of otter recorded within the Wind Farm Site is shown in Figure 6-9.

Plate 6-25: Shallow section of watercourse within the south-western area of the Wind Farm Site where abundant otter spraint and feeding remains were recorded.

Plate 6-26: Otter spraint at this location containing white-clawed crayfish remains.

Map Legend

- EIAR Site Boundary
- Burrows - Rabbit
- Dung - Badger
- Feeding Remains - Otter
- Fox Scat
- Scat - Fox
- Sighting - Hare
- Spraint - Otter

Drawing Title: Mammal Signs

Project Title: Umma More Renewable Energy Development

Drawn By	Checked By
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Project No.	**Drawing No.**
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6.6.2.3.3 *Pine Marten*

A pine marten den was recorded within conifer plantation within the western area of the Wind Farm Site (see Confidential Appendix 6-5). The area surrounding the den was confirmed to be in use during camera trap surveillance undertaken in 2020, where young martens were recorded, implying that the den had been used for breeding that year. Use of the den was not confirmed during surveys in 2021 and 2022. As with the badger sett within this area of the Wind Farm Site, the den was located in close proximity to an initially proposed access road to turbine T4, which was subsequently re-located to avoid disturbance to these features.

Plate 6-27: Young pine marten captured using remote camera trap along a ride within forestry habitat.

6.6.2.3.4 *White-clawed Crayfish*

The presence was white-clawed crayfish within the watercourses that flow through the Wind Farm Site was confirmed by live observations of adults and juveniles recorded as part of macro-invertebrate kick sampling (see Appendix 6-3) and from prey remains found in otter spraint (see Section 6.5.2.4.2).

6.6.2.3.6 Bats

Bat surveys undertaken within the Wind Farm Site in 2020 and 2022, in accordance with NatureScot (formerly Scottish Natural Heritage) Guidance (SNH 2021) form the core dataset for the assessment of effects on bats. Bat surveys included roost surveys, manual transect surveys and ground-level static surveys. The full detailed results of the bat surveys are provided within Section 4.3 of the Bat Report (Appendix 6-2 of this Biodiversity Chapter). These are summarised below.

Bat Habitat Appraisal

Wind Farm Site

With regard to foraging and commuting bats, areas of open grassland habitats were considered of *Low* suitability, i.e. habitat features on site likely to be used by a small number of commuting or foraging bats (Collins, 2016). Hedgerows and treelines forming field boundaries, as well as scrub, provide good connectivity to the surrounding landscape. As such, they were assessed as having *Moderate* suitability i.e. Continuous habitat that is well connected to the wider landscape (Collins, 2016). Mature treelines surrounding the derelict house and associated farm buildings in the centre of the Wind Farm Site were assessed as having *High* potential for commuting and foraging. All other habitats present were assigned a *Negligible* value.

With regards to roosting bats, a number of mature broadleaf trees were identified within the buffer zones of Turbine 1, Turbine 4 and Turbine 5 presenting *Moderate* and *High* roosting potential. The trees were characterised by extensive ivy cover as well as presence of branch damage and cuts providing potential roosting features suitable for opportunistic and regular roosting. The broadleaf trees surrounding T4 form boundaries surrounding the existing conifer plantation. Trees located near the other turbines are part of linear field boundary features.

Grid Connection

The Grid Connection underground electrical cabling route is approximately 31km in length and will run from the proposed onsite 110kV substation to the existing Thornsbury 110kV substation in the townland of Derrynagall or Ballydaly, County Offaly.

There are a total of 34 identified watercourse and existing culvert crossings along the underground electrical cabling route, of which 11 no. are EPA/OSI mapped crossings. All EPA crossings, as well as five culvert and drain crossing locations, were assessed on 17th February 2022 for their suitability to support roosting bats. The location of the surveyed watercourse, culvert and drain crossings is presented in Figure 3-1 of the Bat Report (Appendix 6-2).

The Grid Connection temporary construction compound and onsite 110kV substation are located within the Wind Farm Site and the habitats in which they are located are addressed above. The majority of the lands on either side of the road along the length of the underground electrical cabling route comprise Improved agricultural grassland (GA1), with associated Stonewalls and other stonework (BL1), Hedgerow (WL1) and buildings (ED3). With regard to commuting and foraging bats, features along the underground electrical cabling route were assessed as having *Low-Moderate* suitability i.e. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water (Collins, 2016).

With regard to roosting bats, habitat features along the underground electrical cabling route, including wet grassland and scrub, were assessed as having *Negligible* suitability i.e. Negligible habitat features likely to be used by roosting bats/trees of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential (Collins, 2016).

Details on habitat suitability in relation to other potential roosting features is presented below.

Roost Surveys

Following a search for roosts in 2020 and 2022, three structures containing potential suitable bat roost features were identified within the Wind Farm Site: a derelict building (Umma House) and its associated outbuildings, and an agricultural shed. The structures were subjected to interior and exterior inspections to search for evidence of bats. Details of the inspection surveys are presented below, while Table 4-3 of the Bat Report (see Appendix 6-2) summarises the findings of the bat activity surveys carried out on the structures. The structures will not be impacted by the Proposed Development.

Derelict House (Umma House)

A two-storey derelict house (IG Ref: N 19815 45271) was identified within the centre of the Wind Farm Site. It consisted of a slate roof, ridge tiles, plastic fascia and lead flashing, with no underfelt lining. Bat access points included holes in the roof slates, under ridge tiles and lead flashing, as well as gaps and cracks around the windows.

During the daytime inspections, evidence of feeding remains and small amounts of bat droppings were identified within the structure, along stairways leading from the ground floor to the upper floor. The structure was subsequently confirmed as a roost during emergence surveys which were carried out in Spring, Summer and Autumn 2020, as detailed in Table 4-3 of the Bat Report (see Appendix 6-2). Bat activity was high around the house following the roost surveys, with bats being observed foraging and commuting along the mature treeline surrounding the house and its associated outbuildings.

In Summer 2022, five specimens of Common pipistrelles were observed around the derelict property (Umma House) approximately 25 minutes after sunset suggesting bats were potentially roosting nearby. Three Leisler's bats were also observed commuting to the derelict property (Umma House) and foraging around a mature ash tree in its proximity.

Derelict Outbuildings

The second feature identified as a potential roost (IG Ref: N 19727 45358), was located near the derelict property (Umma House), and comprised a series of old outbuildings including a hayshed, stables and animal holding area, as well as a single-storey stone shed. The outbuildings had new galvanised roofs, while the stone shed had a partially collapsed slate roof with partial underfelt (Plate 4-5 and 4-6). Potential bat access points were through open doors, windows, and gaps within the stonework. No evidence of roosting bats was identified during daylight inspections. While no bats were seen emerging from the outbuildings during any of the roost surveys, they were identified as having *Moderate* suitability.

Storage Shed

In 2022, one additional structure presenting suitable bat roost features was identified within the Wind Farm Site (IG Ref: N 18969 46870). The structure was a single storey concrete block shed with galvanised roof, with an internal storage area accessible from the exterior. It was assigned a *Low* roosting potential.

High bat activity levels were recorded around the shed during transect activity surveys on the 20th of May 2022. An emergence survey was subsequently carried out on the 27th May 2022. No bats were observed emerging from the shed, however bats were observed commuting and foraging continuously along a mature broadleaved treeline which is located adjacent to the shed. Activity was dominated by Common pipistrelle and Leisler's bat. One brown long-eared bat and one Soprano pipistrelle were also recorded.

Grid Connection – Inspection of Watercourse Crossings

As described above, there are a total of 34 identified watercourse and existing culvert crossings along the underground electrical cabling route, of which 11 no. are EPA/OSI mapped crossings. All EPA crossings, as well as five culvert and drain crossing locations, were assessed on 17th February 2022 for their suitability to support roosting bats. The location of the surveyed watercourse, culvert and drain crossings is presented in Figure 3-1 of the Bat Report (Appendix 6-2).

Following the daytime inspections, no evidence of bat use, including live or dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises were identified at any of the watercourse crossings. Crossings with infrastructure presenting *Low* or *Moderate* potential are shown in Plates 4-9 to 4-16 of the Bat Report (see Appendix 6-2). All other crossing points consisted of drains and culverts with *Negligible* roosting potential, as detailed in Table 6-16 below.

The underground electrical cabling route will be confined to the public road corridor. Other than the features identified in Table 6-16, no potential roost features were identified along the underground electrical cabling route. No trees are proposed for felling along the underground electrical cabling route.

Table 6-16: Proposed Grid Connection Watercourse, Culvert and Drain Crossings

Watercourse Crossing Reference No.	Location (Irish Grid Ref.)	Watercourse Bridge Type	Bat Habitat Suitability	Proposed Crossing Option
EPA Crossings				
EPA1	E 220570 N 244829	Concrete pipe	Negligible	C
EPA2	E 222869 N242560	Stone culvert	Low	D
EPA3	E 223307 N242071	Stone arch bridge with stone abutments	Moderate	D
EPA4	E 223596 N241539	Stone arch bridge with stone abutments	Moderate	D
EPA5	E226241 N238741	Stone culvert	Low	D
EPA6	E 227645 N38253	Clear span bridge with stone abutments	Low	C
EPA7	E 232925 N235299	Stone bridge	Low	D
EPA8	E233287 N233113	Concrete pipe	Negligible	C
EPA9	E232813 N232078	Concrete pipe	Negligible	C
EPA10	E232585 N230539	Concrete pipe	Negligible	A
EPA11	E233825 N228491	Clear span bridge	Low	D
Culvert and Drain Crossings				
CD11	E 222914 N242302	Concrete pipe	Negligible	C
CD13	E233096 N734977	Stone culvert	Low	A
CD14	E233064 N234583	Concrete pipe, storm drain	Negligible	C
CD15	E233104 N234439	Concrete pipe	Negligible	C
CD16	E233259 N234317	Concrete pipe	Negligible	A

*Option A: Standard Trench Detail; Option C: Flat bed Over/Under; Option D: HDD.

Manual Transect Surveys

Manual Activity surveys were undertaken in Spring, Summer and Autumn 2022. Bat activity was recorded on all surveys, which included roost emergence and transect surveys. In general, Common pipistrelle (n=989) was recorded most frequently, followed by Leisler's bat (n=304) and Soprano

pipistrelle (n=139). *Myotis spp.* (n=20) and Brown long-eared bat (n=2) were rare. Full detailed results and species composition for the manual transect surveys are provided in Section 4.3.3 of the Bat Report (Appendix 6-2).

Transect surveys were either carried out as standalone surveys (Spring and Autumn) or followed roost emergence surveys (Summer). To account for differences in survey effort, survey results were calculated as bat passes per km surveyed. Common pipistrelles were most frequently recorded across all transect surveys, with most activity being recorded in summer compared to other species. All transect surveys were carried out at dusk. Figures 4-1 to 4-3 of the Bat Report (Appendix 6-2) present the spatial distribution of bat activity across the surveys for each survey season for 2022. Bats were observed and recorded commuting along the linear features between the surveyed derelict building and treelines to surrounding areas.

Ground-level Static Surveys

In total, 131,359 bat passes were recorded across 2022. Common pipistrelle (n=91,977) were the dominant species. followed by Soprano pipistrelle (n=22,052) and Leisler's bat (n=11,475). Instances of *Myotis* spp. (n=3,755) and Brown long-eared bat (n=1,991) were significantly less. Nathusius' pipistrelle (n=109) were recorded infrequently. Full detailed results and species composition for the ground-level static surveys are provided in Section 4.3.3 of the Bat Report (Appendix 6-2).

Bat activity was calculated as total bat passes per hour (bpph) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Table 6-17 presents these results for each species. The summer re-deployment has been included separately. Bat activity was dominated by common pipistrelle across all seasons. In addition, soprano pipistrelle occurred frequently throughout all seasons and Leisler's bat occurred frequently in Spring and Summer. Instances of Nathusius' pipistrelle, Brown Long eared bat, and *Myotis* spp. were relatively rare.

Table 6-17 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, All Nights)

Species	Spring	Summer	Autumn
Myotis spp.	4.07	8.59	6.9
Leisler's bat	3.96	35.8	18.92
Nathusius' pipistrelle	0.01	0.00	0.48
Common pipistrelle	34.28	202.12	217.74
Soprano pipistrelle	14.43	58.27	39.69
Brown long-eared bat	0.61	2.56	6.4
Total Survey Hours	**152.9**	**186.4**	**221.8**

The Nightly Pass Rate (i.e. total bat passes per hour, per night) was used to determine typical bat activity at the Wind Farm Site. However, activity is often variable between survey nights. Therefore, the Median Nightly Pass Rate was also used to assess bat activity, as it has been identified as a more appropriate measure (Lintott & Mathews, 2018). Zero data, when a species was not detected on a night, was also included.

2022 recorded highest activity in Summer and Autumn and most detectors, with species compositions being similar across the Wind Farm Site.

Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the *'Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further

protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976-2022. Bats as an Ecological Receptors have been assigned ***Local Importance (Higher value)*** on the basis that the habitats within the Wind Farm Site are utilized by a regularly occurring bat population of Local Importance.

A roosting site of Local Importance was identified within the Wind Farm Site, as two bat species were observed emerging from the derelict property (Umma House) during surveys carried out in Summer and Autumn 2020. No roosting site of National Importance (i.e. site greater than 100 individuals) was recorded. The identified roosts will be avoided by the Proposed Development.

6.6.2.3.7 Aquatic Surveys

Kick Sampling Results

Locations along the Dungolman_030 watercourse within the Wind Farm Site as well as watercourses that occur along the Grid Connection underground electrical cabling route, were subject to biological evaluation and assessment through kick sampling. Full details of the results of these surveys are provided in Appendix 6-3. A map of the kick sample locations is provided in Figure 6-2.

The survey included a general habitat assessment and biological water quality assessment at watercourses within the Wind Farm Site and along the Grid Connection underground electrical cabling route. The water quality, as per Q-value (Quality Rating System)[21], is fully described in Appendix 6-3. One sampling area identified during the desk study was dry and it was therefore not possible to carry out kick sampling at this location (Cable Route Sampling Station 2). The sample locations that could be assessed were all categorised as being a Q value of Q3 'Moderately polluted', with the exception of Sample Station 1 which was categorised as Q3-4 i.e. 'Moderately Polluted' to 'Polluted'.

6.6.2.3.8 Other Fauna

Irish hare (*Lepus timidus ssp. hibernicus*) was observed on occasion within the Wind Farm Site. The scats prints and foraging activity of fox (*Vulpes vulpes*) were also recorded in a number of areas within the Wind Farm Site. No evidence of amphibians (although species such as common frog and common toad are highly likely to be present), species listed in Annex II or IV of the EU Habitats Directive, or other species of conservation concern was identified within the boundaries of the Proposed Development site.

The site of the Proposed Development was not suitable for other Annex IV species for which strict protection under the Regulations i.e. natterjack toad, Kerry slug, cetaceans or marine turtles, and no information suggesting these species are present in the vicinity of the Site were identified during the desk study or site surveys. The presence of bats and otter within the Site has resulted in these species groups being classified as Key Ecological Receptors (see Section 6.5.2.5 below). Requirements for mitigation in relation for these species are set out in Section 6.6. The requirement for strict protection for these species under the Birds and Natural Habitats Regulations (2011) has therefore been fully complied with.

The semi-natural grasslands on the Wind Farm Site are likely to provide supporting habitat for a wide variety pollinator species. Incidental records of invertebrates were recorded during the walkover surveys of the Site. In addition to the aquatic invertebrates identified during kick samples of the watercourses on Site, the following include the species commonly recorded within the Proposed Development site survey area:

- Meadow brown butterfly (*Maniola jurtina*)

[21] *Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C.,. & MacGarthaigh, M. (2005). Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.*

- Speckled wood (*Pararge aegeria*)
- Red admiral (*Vanessa atalanta*)
- Ringlet butterfly (*Aphantopus hyperantus*)
- Tiger moth (*Aphantopus hyperantus*)
- Nursery web spider (*Pisaura mirabilis*)

6.6.2.4 Identification of Key Ecological Receptors

Table 6-18 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.6 of this report and mitigation/ measures will be incorporated into the Proposed Development where required, to avoid potential significant impacts on the features.

Table 6-6: Key Ecological Receptors identified within the Proposed Development site during the assessment.

Ecological feature or species	Description and Rationale	KER
Designated sites	**Nationally Designated Sites** The following Nationally designated sites are located downstream of the Proposed Development and have been identified as being within the likely Zone of Impact: - Lough Ree pNHA (also designated as an SAC) - River Shannon Callows pNHA (also designated as an SAC)	Yes
	European Designated Sites The following European Sites are identified in the AA Screening as being within the Likely Zone of Impact and are assessed fully in the NIS that accompanies this application: - Lough Ree SAC - River Shannon Callows SAC - Lough Ree SPA - Middle Shannon Callows SPA These sites are assigned **International** importance and are included as KERs.	Yes
Aquatic Habitats and related species	**Rivers and Streams** Rivers and Streams within the Wind Farm Site and along the Grid Connection have been assigned **Local importance (Higher Value)** in that whilst many are highly modified where they adjoin the Wind Farm Site and cross the Grid Connection underground cabling route they are conduits to waterbodies with a high biodiversity value in the local area. They also provide a conduit to downstream SACs of international importance. The watercourses within the Wind Farm Site and along the Grid Connection are classified as a KER due to the potential for indirect effects.	Yes

Ecological feature or species	Description and Rationale	KER
	Aquatic Fauna – Including Fisheries and Invertebrates The aquatic species that are associated with the rivers and streams that are located within and surrounding the Wind Farm Site are assigned **Local Importance (Higher Value)** in that they have a high biodiversity value in the local context. The downstream watercourses and fauna within them have been assigned as of Local Importance (Higher Value) due to the known populations of salmon, trout, eel and lamprey species along with otter. There is potential for indirect effect on these features as a result of impacts on water quality. These species include salmonid, trout, lamprey species, European eel, aquatic invertebrates and other aquatic species. There is potential for indirect effect on these features and they are collectively classified as a KER for further assessment along with upland eroding rivers.	Yes
Hedgerow and Treelines	**Hedgerow (WL1) and Treeline (WL2)** Hedgerows and Treeline have been assessed as of **Local Importance (higher value)** as they provide connectivity to the wider landscape and provide supporting habitat for a wide variety of faunal species. In order to facilitate some of the Proposed Development footprint and maintain a separation in distance between the turbine blades and hedgerow features (likely to be used by commuting and foraging bat species locally), there will be some loss of hedgerow habitat within the Wind Farm Site. For this reason, hedgerows have been identified for further assessment as a KER.	Yes
Grassland habitats and Scrub	**Improved Agricultural Grassland (GA1), improved Wet Grassland (GS4) and Scrub (WS1)** Improved agricultural grassland (GS4) and Wet Grassland have been assessed as of local importance (lower value) as they are generally of low biodiversity value primarily due to fragmentation, intensification and scrub encroachment associated with the surrounding afforestation of the landscape. However, the habitat is of some local importance to local wildlife (NRA, 2009). Scrub (WS1) habitat is of some local importance to local wildlife (NRA, 2009). However, the habitat is common and widespread in the wider area. As such, the habitat has been assessed as of Local Importance (lower value). There will be no significant loss of these habitats at any geographic scale as a result of the Proposed Development. These habitats are not classified as a KER's and therefore are not considered further in this assessment.	No
Built and man-made habitats (ED2 and BL3)	**Spoil and Bare Ground and Buildings and Artificial Surfaces** These are existing man-made habitats which support limited vegetation or provide limited faunal habitat. These habitats are likely used by fauna for commuting through the lands within the Site but are of limited ecological significance.	No

Ecological feature or species	Description and Rationale	KER
	These habitats are not of ecological significance and are not classified as a KER	
Conifer Plantation (WD4)	Plantation forestry is of low ecological importance due to the dominance of coniferous species (predominantly Sitka Spruce) and lack of biodiversity within the habitat. This habitat is assigned **Local Importance (lower value)** and is not classified as a KER.	No
Otter	The presence of otter within the Wind Farm Site was confirmed from the ecological surveys and the species utilises the watercourses within the Wind Farm Site. No evidence of the species was recorded along the Grid Connection although the species is assumed to utilise the watercourses that cross the route. No holts or resting places were recorded within the Wind Farm Site or along the Grid Connection during the surveys. Otter have been assessed as of **Local Importance (higher value)**. This is also because the species is listed in Annex II and IV of the EU Habitats Directive. No evidence of a more ecologically important population was recorded during the site surveys undertaken. The Proposed Development has the potential to result in indirect effects on otter (given that no holts or resting places were recorded this is most likely to result from a deterioration in habitat associated with indirect water pollution or disturbance during construction/ decommissioning) and it is therefore included as a KER and requires further assessment. Otter have therefore been classified as a KER due to the potential for indirect effects.	Yes
Bats	The habitats within and surrounding the Proposed Development site are likely to be utilised by a bat population of **Local Importance (higher value)**. All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended and European legislation – (Habitats Directive (92/43/EEC). Bats are likely to forage and commute within the vicinity of the Proposed Development. No potential bat roosting features were identified within the Proposed Development footprint; a bat roost of Local Importance was identified within the wider Survey Area. The Proposed Development has the potential to result in direct and indirect effects on the receptor. Therefore, bats are included as a KER for further assessment.	Yes
Badger	Badger as an ecological receptor has been assigned **Local Importance (Higher value)** on the basis that the habitats within the Site are utilised by a locally occurring badger population judged to be of Local Importance. A number of setts were present within the Wind Farm Site, however no sett that classified as a main (or breeding) sett was recorded. The Proposed Development design has been altered to avoid potential for direct disturbance related impacts on the species. Given that the species is known to inhabit the area, potential for indirect impacts on badger is considered further in this assessment and the species has been included as a KER for further assessment.	Yes
Pine marten	Pine marten are present within the Wind Farm Site and a den was located on the edge of conifer plantation habitat that was used for breeding in	Yes

Ecological feature or species	Description and Rationale	KER
	2020. Pine marten as an ecological receptor have been assigned as **Local Importance (Higher Value)**. The Proposed Development design has been altered to avoid potential for direct disturbance related impacts on the species. Given that the species is known to inhabit the area, potential for indirect impacts on pine marten is considered further in this assessment and the species has been included as a KER for further assessment.	
Reptiles and Amphibians	It is considered that the Proposed Development will not result in a significant loss of suitable habitat for reptiles and amphibians. No amphibians or reptiles were recorded during the ecological surveys (although likely presence is inferred); there is therefore no evidence of populations of amphibians being significant at more than a local level. No likely significant effects on these species are anticipated and therefore further survey/ assessment was not deemed necessary. Based on the low number of amphibian records for the site and the highly afforested nature of parts of the survey area, amphibians and reptiles have been assessed as of **Local Importance (lower value).**	No
Fisheries and Aquatic Fauna	The aquatic species that are associated with the watercourses occurring within the Wind Farm Site and along the Grid Connection underground electrical cabling route, including white-clawed crayfish, have been assigned **Local Importance (Higher Value)** as they have a high biodiversity value in the local context. The downstream watercourses and fauna within them have been assigned as of **Local Importance (Higher Value)** due to the known populations of salmonid, trout, lamprey species, white clawed crayfish, European eel, aquatic invertebrates and other aquatic species. Potential for indirect effect on these receptors as a result of impacts on water quality associated with the construction phase of the Wind Farm Site and the installation of the Grid Connection underground electrical cabling route has been identified. Fish and other aquatic species are therefore included as a KER for further assessment along with depositing lowland rivers described above.	Yes
Invasive species	No invasive species were recorded within the Proposed Development site, and there is therefore no potential for significant effect. Invasive species are not identified as a KER.	No
Additional fauna (e.g. Irish hare, fox etc).	The recorded evidence suggests that the Proposed Development site is not utilised by populations of higher than local significance, and no potential for significantly effects have been identified at the population level For this reason, other faunal species are not considered further in this EIAR. Significant effects are not anticipated.	No

6.7 Ecological Impact Assessment

6.7.1 Do-Nothing Scenario

If the Proposed Development were not to proceed, the majority of the lands within the Wind Farm Site would continue to be managed as heavily improved and seminatural agricultural grassland and associated grazing. The other habitats identified within the EIAR Site Boundary, including scrub and woodland wet ditches and watercourses would likely remain in a similar condition. In some areas of seminatural grassland where scrub succession is establishing, this scrub is likely to develop and in time, this may undergo succession to small areas of woodland. The general biodiversity on the site, as

described in this chapter, would likely remain similar to its current state as activity levels and land use would not change significantly.

6.7.2 Effects on Designated Sites

None of the elements of the Proposed Development are located within the boundaries of any Nationally or European designated sites (see Figure 6-4 and Figure 6-5). There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Development.

Two nationally designated sites have been identified as being within the zone of influence, on a precautionary basis, due to potential for indirect impacts and have therefore been assigned as KERs. These are:

- Lough Ree pNHA
- River Shannon Callows pNHA

These nationally designated sites that are also designated as European Sites (SACs) have been assessed under those designations within the Appropriate Assessment Screening Report and NIS, with the relevant conclusions are recorded and referenced in this chapter.

In relation to European sites, an Appropriate Assessment Screening Report and NIS have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening and an Appropriate Assessment for the Proposed Development in compliance with Article 6(3) of the Habitats Directive.

As per the aforementioned EPA Guidance (2022), *"A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Screening for Appropriate Assessment concluded as follows:

> *'Following an examination, analysis and evaluation of the relevant data and information set out within this Screening Report, it cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:*
>
> - Lough Ree SAC
> - River Shannon Callows SAC
> - Lough Ree SPA
> - Middle Shannon Callows SPA
>
> *As a result, an Appropriate Assessment is required, and a NIS has been prepared in respect of the Proposed Development in order to assess whether the Proposed Development will adversely impact the integrity of these European Sites'.*

The findings presented in the NIS are that:

> *'Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its*

appendices. The measures ensure that the construction and operation of the Proposed Development will not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

6.7.3 Likely Significant Effects During Construction Phase

6.7.3.1 Effects on Habitats During Construction

Table 6-19 provides details of the extent of the recorded habitats on the Site, the extent of the habitat that will be lost to facilitate the Proposed Development.

Table 6-19: Habitats occurring within the EIAR Site Boundary and extent of habitat lost to the Proposed Development

Habitat	Total Area (Ha) /Length (Km) in the Site	Area (ha)/length (km) to be lost	% of total to be lost	KER?
Improved agricultural grassland (GA1)	498.14 Ha	6.17 Ha	1.2%	No
Wet grassland (GS4)	179.03 Ha	4.59 Ha	2.6%	No
Scrub (WS1)	15.88 Ha	0	0	No
Arable Land (BC1)	25.76 Ha	4.58 Ha	17.8%	No
Dry Meadows and grassy verges (GS2)	3.25 Ha	0 Ha	0%	No
Dry Meadows and grassy verges (GS2) / Scrub (WS1) mosaic	3.54 Ha	0	0%	No
Amenity Grassland (GA2)	7.04 Ha	0	0%	No
Conifer plantation (WD4)	49.31 Ha	6.4 Ha	13%	No
Drainage ditches (FW4)	13.53 km	0 Ha	0%	No
Hedgerows (WL1) and Tree lines (WL2)	29.56 km	2.3 km	7.8%	Yes
(Mixed) broadleaved woodland (WD1)	3.82 Ha	0 Ha	0%	No
Recently-felled woodland (WS5)	3.29 Ha	0.05 Ha	1.5%	No
Short Rotation Coppice (WS4)	2.35 Ha	0 Ha	0%	No
Depositing lowland rivers (FW2)	6.9 km	0	0	Yes
Spoil and bare ground (ED2)	1.16 Ha	0 Ha	0%	No
Recolonising bare ground (ED3)	0.59 Ha	0 Ha	0%	No
Buildings and other artificial surfaces (BL3)	20.07 Ha	0 Ha (some upgrades to existing roads)	0%	No

The Proposed Development will result in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs. This mainly involves the loss of improved agricultural grassland (GA1), wet grassland (GS4) and conifer plantation (WD4) of low ecological value. Any direct or indirect impacts on these habitats are not considered to be significant.

The effects on habitats that are identified as KERs are described in the sections and tables below.

6.7.3.1.1 Assessment of Potential Effects on Rivers/Streams and Sensitive Aquatic Faunal Species

Table 6-20: Potential for impact on Rivers/Streams and Sensitive Aquatic Species

Description of Effect	This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study and detailed survey work and likely to occur downstream of the Proposed Development. The footprint of the Proposed Development has been specifically designed to avoid significant impacts on watercourses. As no instream works are proposed to natural watercourses, there will be no direct effects on these habitats or the species that are associated with them. There will be no loss of fisheries habitat or potential for the Proposed Development to result in any barriers to the movement of aquatic species. There will be no significant direct effects on sensitive aquatic habitats or the species that are associated with them. There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into these watercourses. This represents a potential indirect effect on the identified aquatic receptors in the form of habitat degradation through water pollution. These potential effects on water quality are fully described and assessed in Chapter 9 'Water' of this EIAR and are described here in relation specifically to ecology.
Characterisation of unmitigated effect	In the absence of mitigation, the indirect effect of water pollution on aquatic receptors during construction has the potential be a short-term reversible impact on watercourses which act as a conduit to downstream habitats. The magnitude of any such impact is likely to be at worst moderate, given that all major Proposed Development infrastructure such as turbine bases, site compound etc. are located away from any significant watercourse.
Assessment of Significance prior to mitigation	In the absence of mitigation and following the precautionary principle, there is potential for the Proposed Development to result in significant indirect effects on the identified aquatic habitats and species at a local geographic scale in the form of pollution during the construction phase of the Proposed Development.
Mitigation	A detailed drainage maintenance plan for the Proposed Development is provided in Chapter 4, Section 4.6.7 of this EIAR with additional drainage details described in Section 4.6 generally. This plan provides details of how water quality will be protected during the construction of the Proposed Development. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: 'Water' of this EIAR, see Section 9.5. This provides specific mitigation for the proposed works including mitigation by avoidance, mitigation by design, tree felling, water treatment measures and surface water quality monitoring. In addition, Section 9.5.2.7 of the EIAR also describes the mitigation in relation to morphological changes to surface watercourses & drainage patterns for the Proposed Development Drainage inspection and maintenance is detailed in the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-2 to Chapter 4 of this EIAR, which also provides the details of exactly how the measures will be implemented during construction. The upgrade of existing access tracks and construction of new tracks will involve some works within 50m of watercourses and new watercourse crossings. However, no instream works are proposed to natural watercourses, and a suite of measures are in place to avoid any adverse effects on watercourses. These measures are described in full in the Section 9.5, Chapter 9 'Water' of the EIAR. In addition to the above, Chapter 9 'Water' also prescribes measures for the protection of water quality associated with the required tree felling prior to construction, see Section 9.5.2.2.

Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on aquatic habitats or species, at any geographic scale, as a result of the Proposed Development.

6.7.3.1.2 Assessment of Potential Effects on Hedgerow and Treelines

Table 6-21: Assessment of Potential Effects on Hedgerow and Treeline

Description of Effect	Approximately 2,338m of hedgerow/scrub will be permanently removed within and around the footprint of the Proposed Development to facilitate some elements of infrastructure and new access roads. Removal of this combined length hedgerow/treeline is also required to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021) (see Section 5.2 of the Bat Report (Appendix 6-2).
Characterisation of unmitigated effect	The permanent loss of approximately 2,338 linear metres of hedgerow and treeline would constitute a permanent negative effect on the hedgerow habitat within the Wind Farm Site, albeit a slight one within the context of the surrounding landscape given that some of hedgerow network within the Wind Farm Site is species poor and gappy in places, that and habitat of this nature is widespread and common in the wider area.
Assessment of Significance prior to mitigation	The permanent loss of the proposed 2,338m of hedgerow is not considered to be a significant effect at any greater than the local geographical scale, as this habitat is widespread and common within the local farmland in the wider area. Removal of the proposed sections of hedgerow, which are gappy in places, to accommodate the required buffers for the Proposed Development would nonetheless have the potential to lead to a significant reduction in this habitat within the Wind Farm Site.
Mitigation	It is proposed to plant 3,350m of new hedgerow habitat to offset this potential loss and to provide additional habitat connectivity within the Wind Farm Site (see also Section 6.1.4 of the Bat Report (Appendix 6-2). Table 6-1 of the Bat Report (Appendix 6-2) provides further details on all linear habitat features within the proposed turbine buffers which are proposed for removal for the duration of the Proposed Development, as well as proposed replanting associated with each turbine. The locations in which the proposed planting will take place will be subject to final landowner agreement. However, areas for planting are proposed in the BMEP (see Appendix 6-4) and the Bat Report (Appendix 6-2). Overall, the proposed replanting will result in a net gain of approximately 1,012m in the linear landscape features within the Wind Farm Site. Planting will be of species indigenous to the local area. Further details are provided in the BMEP (see Appendix 6-4).
Residual Effect following Mitigation	Following implementation of mitigation, no potential for significant effect exists at any geographic scale. The planting of additional hedgerow will serve to enhance the hedgerow habitat within the site due to increased species diversity compared to that to be lost, will benefit wildlife and due to the increase of approximately 1,012 linear metres over that to be lost, will result in a net gain in this habitat within the site.

6.7.3.2 Assessment of Potential Effects on Protected Fauna During Construction

The Proposed Development has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the Site but were not included as KERs. Given the extensive area of habitat that will remain undisturbed throughout the Site and the avoidance of the most significant areas

of faunal habitat (including watercourses), no significant effects on non-KER faunal biodiversity are anticipated as a result of the Proposed Development.

White-clawed crayfish were confirmed to be present within the Wind Farm Site during aquatic macroinvertebrate surveys and from otter feeding remains and spraint. It should be noted that no significant habitat for salmonids, lamprey, coarse fish, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the Proposed Development. All infrastructure has been designed to avoid direct impact on watercourses. The potential for significant effects on the above aquatic faunal species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.6.3.1.1 above and is not repeated below.

6.7.3.2.1 Assessment of Potential Effects on Otter

Table 6-22: Assessment of Potential Impacts on Otter

Description of Effect	As described above in relation to aquatic habitats and species, the Proposed Development has been deliberately designed such that all major infrastructure avoids watercourses wherever possible. No instream works are proposed within natural watercourses. There is therefore no potential for direct effect on habitat that is significant for otter. Potential for effects on Otter has been considered regarding NPWS '*Threat Response Plan*'[22](TRP) which identifies four significant threats facing Otter in an Irish context: Habitat destruction, Water pollution, Disturbance (Recreational sources) and Accidental death/persecution
Characterisation of unmitigated effect	There is no potential for direct loss or fragmentation of significant otter habitat including loss of breeding or resting places. No otter holts or resting places were recorded within the Site. There will be no direct mortality related impacts on this species. No instream works, at natural watercourses, are required as part of the Proposed Development. Therefore, there is no potential for the Proposed Development to result in any barrier to the movement of otter. Given that otter were confirmed to use the watercourses within the Wind Farm Site, there is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into watercourses. This represents a potential indirect effect on Otter in the form of habitat degradation through water pollution. In relation to disturbance, otter are predominantly crepuscular in nature and it is anticipated that construction activity will mostly be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Chanin P (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to otters (Jefferies (1987), (Durbin 1993). (Green & Green 1997). Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey &Rochford, 2006).
Assessment of Significance prior to mitigation	Significant effects regarding habitat destruction, fragmentation, barrier effect, disturbance and mortality are not anticipated. In the absence of mitigation, the indirect effect of water pollution on otter during construction has the potential to be a short-term reversible impact. The magnitude of any such impact is likely to be at worst moderate, given that the major infrastructure

[22] *NPWS (2009)Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.*

	such as turbine bases and construction compounds are located over 50 metres from any significant watercourse. Significant disturbance effects are judged to be highly unlikely given the lack of holts recorded, the distance of infrastructure from watercourses and the relative tolerance of otter to temporary disturbance (see above).
Mitigation	As otter are known to occur within watercourses within the Wind Farm Site, and likely also those crossed by the Grid Connection, taking the precautionary principal, a pre-commencement otter survey will be undertaken upstream and downstream of all proposed watercourse crossings/culvert upgrades within the Wind Farm Site and watercourse crossings along the Grid Connection Underground Cabling Route. The following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality, and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken: › From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Development footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for. › All conditions of a derogation licence will be implemented in full. › No works should be undertaken within 150m of any holts at which breeding females or cubs are present. › No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence (TII, 2006[23]). All of the above works will be undertaken or supervised by an appropriately qualified ecologist. In order to avoid any potential for indirect effects on otter, via deterioration in water quality, a detailed drainage maintenance plan for the Proposed Development is provided in Section 4.6 in Chapter 4 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Development. In addition to this, specific mitigation is provided in relation to water quality in Section 9.5, Chapter 9: 'Water' of this EIAR. The Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-2 of Chapter 4 provides the details of exactly how the measures will be implemented during construction. Such drainage design measures will ensure the protection of downstream supporting habitat for otter.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on otter as a result of the Proposed Development.

[23] *NRA, 2006. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf*

6.7.3.2.3 Assessment of Potential Effects on Bats

Table 6-23: Assessment of Potential Impacts on Bats

Description of Effect	As per NatureScot Guidance, wind farms present four potential risks to bats: › Collision mortality, barotrauma and other injuries; (**Operational Phase Impact**) › Loss or damage to commuting and foraging habitat; › Loss of, or damage to, roosts; › and Displacement of individuals or populations. For each of these four risks, the detailed knowledge of bat distribution and activity within the Site has been utilised to predict the potential effects of the Proposed Development on bats (operational phase impacts relating to collision mortality, barotrauma and other injuries are assessed in Section 6.7.4). Bat surveys undertaken in 2022, in accordance with NatureScot 2021 guidance, form the core dataset for the assessment of effects on bats. 2022 results are supplemented by data collected during surveys undertaken on the Site in 2020 and designed in accordance with SNH, 2019 Guidelines.
Characterisation of unmitigated effect	**Loss or damage to commuting and foraging habitat** In absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. The Proposed Development is predominantly located within agricultural land with extensive linear features such as treelines and hedgerows, as well as conifer forestry. Loss of foraging and commuting habitat will result from the implementation of felling buffers, as detailed in Section 6.6.3.1.2 of this EIAR Chapter and 6.1.3 of the Bat Report (see Appendix 6-2), as well as road widening, and construction works. As part of the Proposed Development, tree felling will be required within and around the development footprint to allow for the construction of the turbine bases, access roads underground cabling, and the other ancillary infrastructure. A small section of the Wind Farm Site is located on commercial forestry, namely Turbine no. 4 and its associated infrastructure. A total of 6.4 hectares of commercial forestry will be permanently felled within and around Turbine No. 4 and its associated infrastructure, along with existing treeline boundaries as detailed in Section 6.6.3.1.2 of the Bat Report (see Appendix 6-2). The felling of linear landscape features is proposed to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021). Further details on buffer calculations can be found in Section 6.1.3 of the Bat Report (see Appendix 6-2). In addition, approximately 2,309.m of linear features, including treelines and hedgerows are proposed to be removed as a result of these buffers and road construction works.The resulting loss of foraging habitat and linear commuting habitat represents a potential long-term impact on bats at the local level. **Loss of, or Damage to, Roosts** **Structures** The Proposed Development is predominantly located within agricultural grassland with extensive linear features such as treelines and hedgerows, as well as conifer forestry. Within this landscape, three buildings/structures were identified as providing potential suitable habitat to host roosting bats. Of these, one was identified as a roost for small numbers of common and soprano pipistrelles (see Section 4.3.2 of the Bat Report, Appendix 6-2). No evidence of bats was found within the remaining two structures. All structures will be avoided as part of the Proposed Development, thus no loss or damage to identified or potential roosts is anticipated.

	Trees A small number of trees identified during the roost surveys as having potential to host roosting bats were located within the tree felling buffers detailed in Section 6.1.3. These include trees located within the felling buffers of Turbines 1, 4 and 5. No evidence of bat use was identified during daytime inspection of the trees. However, a potential for indirect effects on bats was identified in the form of loss of roosting habitat resources, as well as direct effects such as temporary disturbance and harm or death as a result of the proposed tree felling. **Watercourse, Culvert and Drain Crossing Infrastructure** There will be no requirement to fell trees/forestry as part of the Grid Connection underground electrical cabling route. Therefore, there will be no loss of tree roosting habitat or linear landscape connectivity associated with these works. Bridges and culvert crossings along the underground electrical cabling route were assessed as having Negligible to Moderate value for roosting bats. The water crossing infrastructure along the underground electrical cabling route will not be altered, in any regard, by the Proposed Development as the options for crossing bridges do not require any works to be carried out on the bridge structure itself, i.e. the bridge culvert. No damage to roosting habitat is expected as a result of the proposed works. Where works related to Options A and C will be in place for culvert crossing CD13 and EPA crossing EPA6, which have been identified as having Low potential to host roosting bats, the proposed works have the potential to cause temporary disturbance to roosting bats. **Displacement of individuals or populations** The Wind Farm Site is predominantly located within agricultural and wet grasslands, surrounded by a network of linear features, as well as conifer forestry plantation. A number of treelines within the turbine felling buffers to be removed provide potential roosting and foraging/ commuting habitat. Factors such as increased noise and artificial lighting during construction have the potential to lead to displacement effects on bats where working hours coincide with periods of bat activity.
Assessment of Significance prior to mitigation	**Loss or Damage to Commuting and Foraging Habitat** Some loss of foraging and commuting habitat will result within the Wind Farm Site to facilitate the construction of infrastructure within the Wind Farm Site and from the implementation of felling buffers, as detailed in 6.1.3 of the Bat Report (see Appendix 6-2), as well as road widening, and construction works. In the absence of mitigation this loss of commuting and foraging habitat represents a potentially significant effect on bat populations at the local level. **Loss of, or damage to, roosts** **Structures** All structures will be avoided as part of the Proposed Development, and thus no significant loss or damage to the identified or potential roosts within buildings/structures is anticipated. **Trees** A small number of trees identified during the roost surveys as having potential to host roosting bats were located within the tree felling buffers detailed in Section 6.1.3. These include trees located within the felling buffers of Turbines 1, 4 and 5. No evidence of bat use was identified during daytime inspection of the trees. However, a potential for indirect effects on bats was identified in the form of loss of roosting habitat resources, as well as

	direct effects such as temporary disturbance and harm or death as a result of the proposed tree felling. Loss of tree roosting habitat therefore represents a potentially significant effect on bat populations at the local level. **Watercourse, Culvert and Drain Crossing Infrastructure** No damage to roosting habitat is expected along the underground electrical cabling route as a result of the proposed works. Where works related to Options A and C will be in place for culvert crossing CD13 and EPA crossing EPA6, which have been identified as having Low potential to host roosting bats, the proposed works have the potential to cause temporary disturbance to roosting bats. These effect would be temporary in nature and are unlikely to represent a significant effect on local populations. **Displacement of individuals or populations** No significant displacement related effects to bats is anticipated at any geographic scale. Potential displacement as a result of an increase in noise and artificial lighting during the construction phase represents a potential short-term non-significant effect on local bat populations.
Mitigation	**Loss or damage to commuting and foraging habitat** Linear vegetation features within the turbine buffer will be removed. A replanting design has been curated to draw bats away from turbine buffers. To comply with NatureScot recommendations in relation to habitat buffering to avoid bat fatalities, a total of 1,383m of hedgerow/tree habitat will be lost as a result of the recommended buffers applied for bats (see Table 6-1 of the Bat Report (Appendix 6-2). In addition, approximately 926m of linear habitats will be removed to accommodate for road widening and construction, resulting in a total of approximately 2,309m of linear features lost. There is an extensive network of existing linear landscape features in the wider area that will be retained, and the loss of hedgerow/trees is not anticipated to have a significant effect on local bat populations. However, it is proposed to plant new linear features and bolster existing habitat features to offset any potential loss in linear habitat features and to provide additional new opportunities for commuting and foraging bats. A total of 3,355m of linear habitat will be added to the existing landscape. The locations in which the proposed planting will take place will be subject to final landowner agreement. However, indicative areas for planting are proposed in Figure 6-1 of the Bat Report (Appendix 6-2). Due to connectivity being maintained across the Wind Farm Site by the existing network of linear vegetation bordering agricultural fields, the proposed replanting will be located in the southern section of the Wind Farm Site, along the existing watercourse which forms the northern boundary of the Wind Farm Site. Connectivity to the stream will be reinforced by bolstering and patching existing hedgerows and treelines distant from proposed turbine locations, in particular where these treelines offer connectivity to the roosts identified during the bat surveys carried out. Overall, the proposed replanting will result in a net gain of approximately 1,046m in the linear landscape features within the Wind Farm Site. Planting will be of species semi-mature to ensure connectivity gains are immediate, and indigenous to the local area. Further details are provided in the BMEP (Appendix 6-4). **Loss of, or damage to, roosts** **Structures** No specific mitigation proposed. **Trees** A number of mature trees presenting potential roosting features were identified within turbine felling buffers, in particular in the vicinity of T1, T4 and T5. Areas subject to felling

are shown in Figure 6-1. Bats comprise mobile species that can move regularly between tree roosts. As such, the trees with potential roosting features have been considered as a "roost resource" and compensation will be provided to cover for the loss of the resource. The following procedures are proposed prior to felling trees with PRFs:

- A bat derogation licence will be obtained from the NPWS for the loss of the roost resource, prior to felling, and the felling activity will be supervised by a qualified ecologist.
- Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures:
  - Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist at the time of felling.
  - Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move.
  - Rigged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist.
  - Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006).
  - Any tree felling will be undertaken outside the bat maternity season (May-August) and the hibernation period (December-February) (Marnell, Kelleher and Mullen, 2022).

Compensation for the loss of trees with alternative potential roosting features will be implemented on a like-for-like basis, through veteranisation of retained trees or the provision of bat boxes:

- A count of all potential roosting features lost will be required to ensure all features are accounted for by compensation measures.
- Veteranisation (i.e. artificially ageing trees by producing non-lethal damage) will be undertaken by professionally trained arborists.
- Bat-boxes produced with woodcrete materials (i.e. Schwegler) will be utilised where veteranisation of existing broadleaves is not possible.

Watercourse, Culvert and Drain Crossing Infrastructure

Where the potential for indirect effects (i.e. disturbance) on bats potentially roosting within watercourse, drain and culvert crossing infrastructure has been identified, the following mitigating procedures are proposed:

- An inspection survey will be carried out prior to the commencement of the works to ensure no bats are roosting within the infrastructure.
  - If the inspection survey cannot provide sufficient data to exclude the presence of a roost (i.e. due to lack of access), an activity survey will also be conducted prior to commencement.
- Where evidence of bats is identified during the above pre-commencement surveys, a Derogation Licence will be required from NPWS for the continuation of the works.
- The works will be carried out outside the maternity (May-August) and hibernation (November-March) seasons to avoid the potential for disturbance on bats during sensitive periods of their lifecycle.

Displacement of individuals or populations

No significant displacement effect on bats are anticipated. Nonetheless, the following best practice and site-specific mitigation measures will be employed to avoid and reduce the potential for significant displacement/ disturbance effects on local bat populations (as fully detailed in Section 6 of the Bat Report (Appendix 6-2):

	Noise Restrictions During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001SI 359/1996). **Lighting Restrictions** Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction (and post construction), shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Development, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Wind Farm Site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK. In addition, the applicant commits to the use of lights during construction in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations: › Every light needs to be justifiable, › Limit the use of light to when it is needed, › Direct the light to where it is needed, › Reduce the light intensity to the minimum needed, › Use light spectra adapted to the environment, when using white light, use sources with a "warm" colour temperature (less than 3000K).
Residual Effect following Mitigation	Following the implementation of mitigation measures as described above, there is no potential for the construction of the Proposed Development to result in Significant effects on bat populations at any geographic scale. There will be no significant effect on the conservation status of any bat species as defined in '*The Status of Protected Habitats and Species in Ireland*' (NPWS, 2019).

6.7.3.2.4 Assessment of the Potential Impacts on Badger

Table 6-24: Potential impacts on badgers

Description of Effect	**Habitat Loss/Fragmentation** Given the nature of the Proposed Development, there will be some minimal loss of suitable badger foraging habitat i.e., improved agricultural grassland (GA1), wet grassland (GS4) and arable fields (BC1), associated with the footprint of the Proposed Development infrastructure.
	Disturbance The access roads for the Proposed Development have been located specifically to avoid impacts on setts recorded during site surveys as far as possible; an early iteration of the design was altered to relocate the access road to turbine T4 to avoid potential for direct impacts on a single entrance outlier sett recorded within the forestry. All proposed infrastructure for the Proposed Development is located over 50m away from the closest recorded sett, as per NRA (2009) guidelines. Given the location of the setts recorded within the Wind Farm Site, there is potential for indirect disturbance to an outlier badger sett recorded within the western forestry area during the baseline ecological surveys as a result of proposed commercial forestry felling (see Section 4.3.1.6.1); all other setts recorded are

	considered to be located outside of the likely zone of impact from the proposed development.
Characterisation of unmitigated effect	**Habitat Loss/Fragmentation** The loss of improved agricultural grassland and arable fields is not considered to be significant given the relatively small scale of the Proposed Development footprint within the extensive area of available suitable habitat locally.
	Disturbance Noise and earth movement during construction works have the potential to disturb badgers occupying setts in close proximity to proposed works during construction. Badger tunnel systems can extend some distance from sett entrances (over 20m in some cases[24]) and therefore any excavation by heavy machinery in close proximity to sett entrances risks causing damage to setts and/or direct harm to badgers in the absence of mitigation. All proposed infrastructure for the Proposed Development has been located specifically to avoid impacts on setts recorded during site surveys, which will be retained, and are located over 50m away from the closest sett as per NRA (2009) guidelines. The sett recorded within the western forestry area was classified as being an outlier sett, and will be retained along with the surrounding broadleaf tree cover; however forestry felling is proposed within the vicinity of this sett, within 30m. Therefore, short-term indirect disturbance effects are likely should this sett be in use at time of commencement of felling operations; however it should also be noted that badgers may construct new setts in a short period of time.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** No significant overall loss or fragmentation of badger foraging habitat is anticipated at any geographic scale.
	Disturbance The potential for physical damage or significant disturbance of occupied setts has been minimised through the sensitive design of the Proposed Development. Three setts have been identified within the Wind Farm Site, which are all located over 50m from the infrastructure of the Proposed Development. A single-entrance outlier sett recorded within the western forestry area is located within 30m of proposed commercial forestry felling, although the see and immediately surrounding broadleaf tree cover will be retained. Given the status of this sett as an outlier sett, which is likely to fall in and out of use, and short-term nature of the proposed forestry felling, potential for disturbance to badgers as a result of construction has been assessed as slight at the local geographic scale in the absence of mitigation. On a precautionary basis however, it is also acknowledged that new setts could be created within the Proposed Development footprint in the intervening period prior to any construction.
Mitigation	**Habitat Loss/Fragmentation** As described above, the Proposed Development infrastructure will be relatively small scale in nature and as such no specific mitigation is required for the avoidance of habitat loss.
	Disturbance/Displacement In order to fully assess the potential for disturbance related effects on badgers during construction, especially given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction badger survey will be carried out in order to assess activity levels at setts and to identify any additional sett entrances that may have been excavated in the intervening period. Any active setts recorded within 50m of the Proposed Development footprint and will subsequently be monitored for a minimum

[24] *National Roads Authority (2009) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.*

	period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity, and to assess the requirement for specific mitigation measures to limit disturbance. All badger survey work will be undertaken in line with current best practice guidance[25]. Should any setts within 50m of the Proposed Development be found to be in active use by badgers during the pre-construction badger monitoring, it would be necessary to ensure that the risk of disturbance to badgers is mitigated appropriately. Any badger mitigation required would be undertaken following published best practice guidelines for the treatment of badgers (NRW, 2009) and in consultation with NPWS. Any setts that could potentially be subject to direct impacts would be excluded and closed in consultation with NPWS, and wherever possible subsequently re-opened following completion of construction to allow badgers to recolonise them. If any works within 50m of an active sett are to take place during the badger breeding season (i.e. July 1st – November 30th) temporary exclusion of these setts during the construction phase would be required prior to the breeding season commencing. The setts would be excluded and closed in consultation with NPWS, and subsequently re-opened following completion of construction to allow badgers to recolonise them. Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Development to avoid heavy machinery access or materials storage in close proximity to the identified badger sett within the forestry that occurs within 30 metres of the proposed forestry felling: › Exclusion zone fencing and appropriate signage will be put in place to prevent any activity that could directly impact the sett. All of the above works will be undertaken or supervised by an appropriately qualified ecologist in advance of construction.
Residual Effect following Mitigation	**Habitat Loss/Fragmentation** No significant fragmentation to or loss of badger foraging habitat is anticipated at any geographic scale.
	Disturbance Following the incorporation of the mitigation measures described above, no significant negative impacts to badgers is anticipated at any geographic scale.

6.7.3.2.5 Assessment of the Potential Impacts on Pine Marten

Table 6-25: Potential impacts on pine marten

Description of Effect	**Habitat Loss/Fragmentation** Given the nature of the Proposed Development, there will be some minimal loss of suitable pine marten foraging habitat i.e. hedgerow, treeline and conifer plantation associated with the footprint of the Proposed Development infrastructure. The identified pine marten den recorded as being active in 2020 is outside of the footprint of the Proposed Development and will be retained. However a number of mature broadleaf trees within the forestry area that may have potentially suitable features for denning or would likely develop such features over time, will be lost to facilitate the Proposed Development.

[25] *National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.*

	Direct Mortality/ Disturbance Given the location of the historical pine marten den recorded within the Wind Farm Site, there is the potential for disturbance to pine marten as a result of construction and forestry felling works within the area of forestry habitat where T4 and associated access roads are proposed. The den was used for breeding in 2020, but was not recorded as being recently occupied during surveys carried out in 2021 and 2022; however it remains possible that the den may be reoccupied in the future. The den is outside the footprint of the Proposed Development infrastructure, the proposed access road to turbine T4 having been relocated to avoid impacts on the den location as for badger (see Section 6.6.3.2.5 above) and will be retained. Should the den be reoccupied in the future at the time of the proposed construction and associated felling works, indirect disturbance to pine marten would potentially occur. Disturbance to pine marten within breeding dens and resting places is also potentially possible within the wider Wind Farm Site, as the habitat within the Wind Farm site offers other denning opportunities for the species. No potential for disturbance as a result of works proposed as part of the Grid Connection were identified.
Characterisation of unmitigated effect	**Habitat Loss/Fragmentation** The loss of tree cover and conifer forestry is not considered to be significant given the relatively small scale of the Proposed Development footprint within the extensive area of available suitable habitat locally. Loss of trees with features potentially suitable for denning is judged to represent a slight effect at the local scale; no suitable tree denning features were identified from the ground, however features that may be present but not visible from the ground and features that could develop within broadleaf trees given their age have been considered as part of this assessment.
	Disturbance/ Displacement Noise and earth movement during construction and felling works have the potential to disturb pine marten occupying dens in close proximity to the Proposed Development during construction. The footprint of the Proposed Development has been located to avoid effects on the den identified during the ecological baseline surveys as far as possible; however short-term disturbance/displacement effects to animals are nonetheless possible, should works coincide with the animals breeding season and the previously recorded den be used for breeding or a new den within the vicinity be used for this purpose.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** No significant overall loss or fragmentation of pine marten foraging habitat is anticipated at any geographic scale. Potential for loss of denning habitat to pine marten as a result of tree felling within the Site has been assessed as slight at the local geographic scale on a precautionary basis in the absence of mitigation.
	Disturbance The potential for physical damage/loss of pine marten dens has been avoided through the location of the footprint of the Proposed Development to avoid and retain the den identified during the ecological baseline surveys, which was recorded as being used in 2020 for breeding. On a precautionary basis, potential for disturbance to pine marten has been assessed as potentially significant at the local geographic scale in the absence of mitigation,

	should the identified den within the forestry habitat come back into use at the time of proposed construction and felling works within this area.
Mitigation	**Habitat Loss/Fragmentation** The Proposed Development infrastructure will be relatively small scale in nature and as such no specific mitigation is required for the avoidance of habitat loss. Loss of mature broadleaf trees associated with T4 in its proposed location may cause a reduction in suitable denning trees, should suitable features be present within these trees that were not visible from the ground. In order to provide compensation and enhancement for this species, two pine marten den boxes will be erected within the retained conifer plantation forestry within the Wind Farm Site in order to provide habitat compensation and enhancement for this species, and ensure that the species continues to have suitable denning opportunities within the Wind Farm Site. The den boxes will be sited on suitable retained broadleaf trees not to be subject to felling in the future. Boxes will be sited and erected in accordance with VWT guidelines[26].
	Disturbance/Displacement In order to fully assess the potential for disturbance related effects on pine marten at the time of construction, especially given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction mammal survey will be carried out in order to assess activity levels at the den location used by the species during 2020, and to identify any additional dens within the Site that may have been created or become occupied in the intervening period. Any active dens recorded within 100m of the Proposed Development will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by pine marten and levels of activity, and to assess the requirement for additional mitigation measures. All survey work will be undertaken in line with current best practice guidance[27]. Should any active pine marten dens within 30m of the Proposed Development footprint (or breeding dens within 100m), including felling buffers, be found to be in active use by the animals during the pre-construction monitoring, it would be necessary to ensure that the risk of direct mortality and disturbance to pine marten is mitigated appropriately. Any pine marten mitigation required would be undertaken following published best practice guidelines and in consultation, and where required under licence from, NPWS. Where any breeding is found to be occurring at dens that could potentially be directly or indirectly affected, no works within 100m will be carried during the breeding season (March – June inclusive), and monitoring with camera traps will be required to ensure until all animals have left the den following breeding prior to any commencement of works within 100m of a breeding den. A derogation licence would be required for any works that could potentially cause disturbance to an occupied pine marten den. Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Development to avoid heavy machinery access or materials storage in close proximity to the identified den within the forestry: › Exclusion zone fencing and appropriate signage will be put in place to prevent any activity that could directly impact the den. All of the above works will be undertaken or supervised by an appropriately qualified ecologist in advance of construction.

[26] *Vincent Wildlife Trust. Constructing, erecting and monitoring Pine Marten Den Boxes.*
[27] *National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.*

Residual Effect following Mitigation	**Habitat Loss/Fragmentation** Following the incorporation of the mitigation measures described above, no significant negative impacts to pine marten is anticipated at any geographic scale.
	Disturbance Following the incorporation of the mitigation measures described above, no significant negative impacts to pine marten is anticipated at any geographic scale.

6.7.4 Likely Significant Effects During Operational Phase

6.7.4.1 Effects on Habitats during Operation

The operation of the Proposed Development will not result in any additional land take, and as such there is no potential for any significant effects in this regard. Terrestrial habitats are not considered to be a KER in the context of the operation of the Proposed Development.

Potential for effects on rivers, streams and sensitive aquatic species remains a KER during operation and is assessed in detail in the following subsections.

6.7.4.1.1 *Effects on Rivers and Streams, and sensitive aquatic faunal species.*

Table 6-26: Assessment of Potential Impacts on Rivers, Streams, and Sensitive Aquatic Faunal Species

Description of Effect	This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e., watercourses), salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs and other aquatic species. The increase in the amount of hard standing associated with the proposed infrastructure has the potential to result in faster water runoff from the site to the surrounding watercourses. This may have the indirect effect of causing erosion, which could lead to deterioration of surface water and supporting habitat quality. Additionally, there is the potential for the faster run off of any pollutants that may be associated with vehicular usage on the site. The predicted impacts on water quality are fully described in Chapter 9: 'Water' of this EIAR and are described here in relation specifically to biodiversity.
Characterisation of unmitigated effect	The emplacement of the Proposed Development permanent footprint, as described in Chapter 4 of the EIAR, (assuming emplacement of impermeable materials as a precautionary scenario) could result in an average total site increase in surface water runoff of approximately 2,392m^3/month (see Section 9.5.3.1 of Chapter 9 'Water'. This represents a potential increase of approximately 0.29% in the average daily/monthly volume of runoff from the site area in comparison to the baseline pre-development site runoff conditions. This is a very small increase in average runoff and results from a relatively small area of the overall Proposed Development site being developed, the Proposed Development permanent footprint being approximately 8.2ha, representing ~0.84% of the total Proposed Development site of 949ha. The additional volume is low due to the fact that the runoff potential from the Wind Farm Site is naturally high (77.5%). Also, the calculation assumes that all hardstanding areas will be impermeable which will not be the case as access tracks will be constructed of permeable stone aggregate. The increase in runoff from the permanent development footprint within the Wind Farm Site will therefore be negligible. This is even before

	mitigation measures will be put in place. Therefore, there will be no risk of exacerbated flooding down-gradient of the Wind Farm Site.
Assessment of Significance prior to mitigation	Pre-mitigation potential impacts as a result of increased surface water runoff have been assessed as being negative, slight, indirect, permanent, moderate probability effect on all downstream surface water bodies.
Mitigation	Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase has been fully mitigated through appropriate design and mitigation as fully described in Section 9.5 of Chapter 9: Water and Section 6 of the CEMP, included as Appendix 4-2 of this EIAR. Within Section 9.5.3.1 of Chapter 9 'Water', the assessment concludes that with the implementation of mitigation, '*that residual effects are - Negative, imperceptible, indirect, long-term, unlikely effect on all downstream surface water bodies.*' The detailed mitigation measures proposed there are not repeated here to reduce repetition throughout the document.
Residual Effect following Mitigation	No potential for significant effect has been identified at any geographic scale as a result of the Proposed Development.

6.7.4.2 Effects on Fauna during Operation

The operation of the Proposed Development will not result in any additional habitat loss or deterioration, nor will it result in a significant increase in anthropogenic activity due to its location and scale.

The Biodiversity Management and Enhancement Plan measures described in Appendix 6-4 will result in the establishment of habitats of higher value for local faunal species. As such the operation of the Proposed Development will not result in a significant impact at any geographic scale. Such measures will have positive effects on the non-volant terrestrial fauna at the site of the Proposed Development. There is no potential for significant negative effects on non-volant terrestrial fauna including otter or badger that were identified as KERs during the construction phase of the Proposed Development.

It is not anticipated that the operation of the Proposed Development will have any effect on otter or its supporting habitat during the operation phase. As described previously in this EIAR, there will be no requirements for in stream works and no loss of riverine habitat. No maintenance works associated with the operation of the Proposed Development are proposed in close proximity to watercourses. All turbines are located significantly away from all EPA mapped watercourses.

It should be noted that all major infrastructure such as turbine bases are located over 50 metres from the watercourses within the Proposed Development, see Figure 9-3, Chapter 9 'Water' of this EIAR. The potential for significant effects on the above aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.7.3.1.2 and is not repeated below.

Potential for significant effects on bat species resulting from the operation of the Proposed Development were identified and therefore, these are identified as KERs during the operational phase.

6.7.4.2.1 Assessment of Potential Effects on Bats during operation

Table 6-27 Assessment of Potential Impacts on Bats during operation

Description of Effect	There is no potential for loss or fragmentation of foraging or roosting habitat for bat species during the operational phase of the Proposed Development as there will be no additional loss of any habitats following construction. The bat survey report that is provided in Appendix 6-2 found bat species composition and abundance to be typical of the geographic location and nature of the site, and that the site is utilised by a regularly occurring bat population of Local Importance. The operational phase of the Proposed Development poses a potential risk to bats in the form of collision mortality, barotrauma and other injuries cause by bats coming into contact or close proximity to operational turbines. Any increase in artificial lighting at night associated with the Proposed Development would have the potential to result in displacement effects on bats. No potential effects relating to bats have been identified along the Grid Connection Underground Cabling Route during the Operational Phase of the Proposed Development.
Characterisation of unmitigated effect	The operation of the Proposed Development has the potential to result in a long-term effect on Pipistrelle species (common, soprano and Nathusius) and Leisler's bat species as a result of mortality due to collision. Section 5.1.2 of the Bat Report (provided as Appendix 6-2) sets out the overall collision risk assessment for these high collision risk species. Site-level collision risk for high collision risk bat species (following NatureScot 2021 guidance) was typically *Medium* (see Sections 5.1.2 and 5.1.3 of the Bat Report for details of collision risk and how this was calculated). Overall bat activity levels were typical of the nature of the Wind Farm Site, which is predominantly agricultural grasslands and conifer forestry with medium levels of bat activity recorded during the static detector surveys as well as the walked transects undertaken. However, following per detector Ecobat analysis, all detectors but three recorded high median activity levels across at least one season (see Table 5-6 of the Bat Report (Appendix 6-2). During manual transect surveys, high activity was noted in the vicinity of three of the static detectors in particular (see Section 5.1.3 of the Bat Report, Appendix 6-2). It is also noted from NatureScot (2021) that bat activity on windfarm sites is highly liable to change following construction of a wind farm due to the changes in habitat that occur to facilitate construction.
Assessment of Significance prior to mitigation	Following the precautionary principle, there is potential for the operation of the Proposed Development to result in Significant effects on the local bat population in the absence of mitigation. The magnitude of this effect, in respect of local bat populations, in the absence of mitigation is **Moderate** at the local scale.
Mitigation	In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species, will be implemented. Further details of this mitigation and how it is calculated is provided in Section 6 of the Bat Report (Appendix 6-2). **Blade Feathering** On a precautionary basis, and in addition to buffers applied to habitat features, it is proposed that all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine

Bat Mitigation and Monitoring Plan

Taking a precautionary approach, and given that high collision risk was recorded at median and peak activity levels, an adaptive monitoring and mitigation strategy has been devised for the Proposed Development in line with the case study example provided in Appendix 5 of the NatureScot (2021) Guidance and based on the site-specific data.

Ongoing monitoring of bat activity will be undertaken for at least 3 years' post construction of the Proposed Development (as per NatureScot, 2021). This will provide data and information on the actual recorded impact of the wind turbines on the local bat populations. Full details of the proposed monitoring programme are provided in Section 6.2.1 of the Bat Report (Appendix 6-2), and includes static detector surveys, walked survey transects and carcass searching in accordance with NIEA guidance within the areas surrounding the turbines to record any bat fatalities resulting from collision. Key weather parameters and other factors that are known to influence collision risk will be monitored.

The results of post construction monitoring shall be utilised to assess changes in bat activity patterns post construction and to monitor the implementation of the bat mitigation strategy (see Section 6.1.2 of the Bat Report (Appendix 6-2). The performance of the curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed will be analysed to confirm the efficacy of the curtailment during different periods of bat activity. At the end of each year, the efficacy of the curtailment programme will be reviewed, and any identified efficiencies incorporated into the curtailment programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Wind Farm Site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally.

Lighting

Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction (and post construction), shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Development, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Wind Farm Site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.

The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK.

In addition, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:

- Every light needs to be justifiable,
- Limit the use of light to when it is needed,
- Direct the light to where it is needed,
- Reduce the light intensity to the minimum needed,
- Use light spectra adapted to the environment, when using white light, use sources with a "warm" colour temperature (less than 3000K).

With regard to the potential for lighting to increase collision risk, it is noted that there will be some illumination of the turbines in the form of aviation lighting, and whilst this lighting is unlikely to result in any significant increase in collision risk, a comprehensive and site-specific mitigation and monitoring programme, described in section 6.2 of the Bat Report (Appendix 6-2), is proposed for a period of at least 3 years post construction. No significant effects of lighting on bats are anticipated; however, if in the course of this monitoring, any

	potential for significant effects on bats is identified, specific measures including curtailment, will be implemented to avoid any such impacts.
Residual Effect following Mitigation	Following the implementation of the monitoring and mitigation described above, there is no potential for significant residual effects on bat populations as a result of the Proposed Development.

6.7.5 Likely Significant Effects During Decommissioning phase

Decommissioning is described in Section 4.9, Chapter 4 of this EIAR. There will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard.

The impacts on biodiversity will also be similar in nature to those experienced during construction but on a far lesser scale and magnitude. There would be no additional or ancillary impacts associated with the decommissioning phase.

The wind turbines proposed as part of the Proposed Development are expected to have a lifespan of approximately 30 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Development may be decommissioned fully.

Upon decommissioning of the Proposed Development, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbine will likely be removed from site using the same transport methodology adopted for delivery to site initially. The turbine materials will be transferred to a suitable authorised recycling or recovery facility.

The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration.

Site roadways could be in use for purposes other than the operation of the Proposed Development by the time the decommissioning of the Wind Farm Site is to be considered, and therefore it may be more appropriate to leave the Site roads in situ for future use. It is envisaged that the roads will provide a useful means of extracting the commercial forestry crop which exists on the Site, and as agricultural roads. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required.

The Grid Connection underground electrical cabling route and onsite substation will remain in place as it will be under the ownership and control of the ESB/ Eirgrid. There are no impacts associated with this.

A Decommissioning Plan has been prepared (Appendix 4-6) the detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the Proposed Development has been fully assessed in the EIAR.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. A decommissioning plan has been prepared and is included as Appendix 4-6 of this EIAR. The plan provides details of the methodologies that will be adopted, throughout decommissioning, the environmental controls that will be implemented, the Emergency Response Procedure to be adopted, methods for reviewing compliance and an indicative programme of decommissioning works. The CEMP for the Proposed Development also provides details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the Proposed Development. In addition, the measures incorporated into the construction phase, in Section 6.6.3.1 of this EIAR chapter, including specific mitigation provided in relation to water quality in Chapter 9: 'Water', will be implemented during decommissioning. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Development to result in significant effects on biodiversity.

6.8 Cumulative Impact Assessment

The Proposed Development was considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 6.6.4 of this report, including European Sites, Nationally designated sites. This included a review of online Planning Registers and served to identify past and present plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Chapter 2: Background of the Proposed Development.

6.8.1 Assessment of Plans

The following development plan has been reviewed and taken into consideration as part of this assessment:

- Westmeath County Development Plan 2021 - 2027.
- Offaly County Development Plan 2021 - 2027
- National Biodiversity Action Plan 2017-2021
- Draft 4th National Biodiversity Action Plan 2023-2027
- Eastern and Midlands Regional Assembly: Regional Spatial & Economic Strategy 2019-2031 (RSES)

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of wetlands, waterways and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6-28.

European sites are specifically considered in the AA Screening Report and Natura Impact Statement that accompanies this application.

Table 6-7: Assessment of plans and policies

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Westmeath County Development Plan 2021 - 2027	**Natural Heritage and Biodiversity Policy Objectives** It is a policy of Westmeath County Council to: **CPO 12.1:** Contribute as appropriate towards the protection of designated sites in compliance with relevant EU Directives and applicable national legislation. **CPO 12.2:** Support the implementation of any relevant recommendations contained in the National Biodiversity Plan, the All Ireland Pollinator Plan and the National Peatlands Strategy. **CPO 12.3:** Support the implementation of the Westmeath Biodiversity Action Plan 2014-2020 and any revisions made thereto. **Natura 2000 Sites Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.4:** Protect and conserve Special Areas of Conservation, candidate Special Areas of Conservation, Special Protection Areas and candidate Special Protection Areas, designated under the EU Birds and Habitats Directives respectively. **CPO 12.5:** Ensure that no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, Westmeath County Development Plan 2021-2027 386 decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects). *Footnote*: Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place.	The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. A comprehensive Screening for Appropriate Assessment and Natura Impact Statement has been submitted along with this application. The Proposed Development has been designed in order to avoid loss of sensitive habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan. The Proposed Development is located outside of any Nationally designated sites, as described in Section 6.5.1.1. and no significant residual effects have been identified in relation to sites of this nature. No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified. No projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.6: Ensure that any plan or project that could have a significant adverse impact (either by themselves or in combination with other plans and projects) upon the conservation objectives of any Natura 2000 Site or would result in the deterioration of any habitat or any species reliant on that habitat will not be permitted. *Footnote*: Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place. **CPO 12.7:** Assess any plan or project in accordance with Article 6 of the Habitats Directive to determine whether the plan or project is likely to have a significant effect on the site either individually or cumulatively upon the integrity, conservation objectives and qualifying interest of any Natura 2000 Site. **CPO 12.8:** Require an ecological appraisal for development not directly connected with or necessary to the management of Natura Sites, or a proposed Natura Site and which are likely to have significant effects on that site either individually or cumulatively. **CPO 12.9:** Identify and provide appropriate buffer zones between Designated Sites and local biodiversity features and areas zoned for development. **CPO 12.10:** Prepare Strategic Habitat Management Plans for Natura 2000 Sites in Council ownership in consultation with the National Parks and Wildlife Service and relevant stakeholders. **CPO 12.11:** Promote the maintenance and as appropriate, achievement of favourable conservation status of habitats and species and to improve the ecological coherence of the Natura 2000 network, by maintaining and where appropriate, developing features in the landscape which are of major importance for wild fauna and flora. **CPO 12.12:** Require that new development proposals affecting designated sites have regard to the sensitivities identified in the SEA Environmental Report prepared in respect of this plan. **Rare and Protected Sites Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.13:** Protect, manage and enhance the natural heritage, biodiversity, landscape and environment of County Westmeath, in recognition of its importance as both a nonrenewable resource and a natural asset.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.14: Require all new developments in the early pre-planning stage of the planning process to identify, protect and enhance ecological features by making provision for local biodiversity (e.g. through provision of swift boxes, bat roost sites, green roofs, etc.) and provide links to the wider Green Infrastructure network as an essential part of the design process. **CPO 12.15:** Support the protection of all native woodlands listed in the National Survey of Native Woodlands 2003 to 2008. **CPO 12.16:** Apply the precautionary principle in relation to development proposals in areas identified as being of national nature conservation interest, by requiring a Scientific/ Ecological Risk Assessment to ensure that the development will not impact on the integrity and habitat value of the site. **CPO 12.17:** Support and cooperate with Statutory Authorities and other relevant bodies in support of measures taken to manage designated nature conservation sites, in order to achieve their conservation objectives. Specific regard shall be had to Conservation Management Plans and their conservation objectives/ management practices, where they exist. **CPO 12.18:** Consult with the National Parks and Wildlife Service (NPWS) in regard to any developments (those requiring permission and those not requiring planning permission) which the Council proposes to carry out within pNHAs, NHAs, SACs, SPAs, and other important ecological sites. **CPO 12.19:** Maintain the conservation value of Council owned land within NHAs and pNHAs and promote the conservation value of Council owned lands adjoining NHAs. **CPO 12.20:** Protect and conserve NHAs and pNHAs including NHAs that become designated and notified to the Local Authority during the lifetime of the Plan and seek to develop linkages between designated sites, where feasible and as resources permit. **CPO 12.21:** Lighting fixtures should provide only the amount of light necessary for personal safety and should be designed so as to avoid creating glare or emitting light above a horizontal plane. Lighting fixtures should have minimum environmental impact and Dark Sky lighting should be considered in the interest of reducing the impact of lighting on wildlife as part of any future planning application, thereby contributing towards the protection of amenity and the protection of light sensitive species such as bats. EUROBATS guidelines should be applied in informing proposed development(s), where relevant.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.22: Require, in special circumstances where protected species/habitats are identified in association with a development proposal, that an 'Ecological Impact Assessment (EcIA)' prepared by a suitably qualified and indemnified person be undertaken for a proposed development which may potentially have a significant impact on rare and threatened species. **Sites of Biodiversity Value and Non-designated Sites Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.23 :**Seek to create and enhance ecological linkages and buffer zones from development. **CPO 12.24:** Protect and where possible enhance biodiversity and ecological connectivity, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, geological and geo-morphological systems, other landscape features, natural lighting conditions, and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive. Appropriate mitigation and/or compensation to conserve biodiversity, landscape character and green infrastructure networks will be required where habitats are at risk or lost as part of a development. **CPO 12.25:** Recognise that nature conservation is not just confined to designated sites and acknowledge the need to protect non-designated habitats and landscapes and to conserve the biological diversity. **CPO 12.26:** Investigate a protocol in relation to the application of an ecosystem services scoring approach to inform the assessment of planning applications. **Invasive Species Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.27:** Prevent the spread of invasive species within the plan area, including requiring landowners and developers to adhere to best practice guidance in relation to the control of invasive species. **CPO 12.28:** Ensure that proposals for development do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are or were previously present, the	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	applicant will be required to submit a control and management program for the particular invasive species as part of the planning process and to comply with the provisions of the European Communities Birds and Habitats Regulations 2011 (S.I. 477/2011). **CPO 12.29:** Support, as appropriate, the National Parks and Wildlife Service's efforts to seek to control and manage the spread of non-native invasive species on land and water. Where the presence of non-native invasive species is identified at the site of any proposed development or where the proposed activity has an elevated risk of resulting in the presence of these species, details of how these species will be managed and controlled will be required. **Trees, Woodlands and Hedgerows Policy Objectives** **CPO 12.37:** Preserve and enhance the amenity and biodiversity value of the County, by promoting the protection of trees, groups of trees and ancient woodlands, of significant amenity value, especially native and broadleaf species. **CPO 12.38:** Protect trees subject to Tree Preservation Orders and seek to designate additional Tree Preservation Orders, where appropriate. **CPO 12.39:** Discourage the felling of mature trees and hedgerow, particularly species rich roadside and townland boundary hedgerows to facilitate development and seek Tree Management Plans to ensure that trees are adequately protected during development and incorporated into the design of new developments. **CPO 12.40:** Protect and preserve existing hedgerows in new developments, particularly species rich roadside and townland boundary hedgerows, and where their removal is necessary during the course of road works or other works seek their replacement with new hedgerows of native species indigenous to the area. **CPO 12.41:** Support increases in tree cover (of suitable species) and native species hedgerows in all towns and villages across Westmeath due to air quality, shade, aesthetic and health benefits they provide. **CPO 12.42:** Encourage the development of proposals for new woodlands and community woodlands in urban/urban fringe areas utilising funding available through schemes such as the NeighbourWood and Native Woodland Schemes.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.43: Encourage the protection of the trees which are considered an important component of demesne landscapes. **CPO 12.44:** Support the development of a plan for the protection and maintenance of public trees and public native hedgerows in urban areas. **CPO 12.45:** Require, where necessary, a Tree Management Plan (with suitable native species) to be submitted as part of new development proposals. Ensure that, where possible, established trees are incorporated into the overall design of new developments and are fully protected during development works in accordance with BS standards. **CPO 12.46:** Support the use of suitable marginal lands in Council ownership for community projects such as neighbourhood schemes and biodiversity projects. **CPO 12.47:** Support the preparation of a Tree Planting Policy for the County which promotes biodiversity and indigenous tree planting. **Wetlands Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.48:** Resist development that would destroy, fragment or degrade any wetland in the County. **CPO 12.49:** Support the implementation of recommendations made in the County Westmeath Wetlands Survey 2019 and subsequent versions thereof. **CPO 12.50:** Require an Ecological Impact Assessment where is it proposed to fill or reclaim a wetland area. **CPO 12.51:** Protect floodplains, wetlands and watercourses, for their biodiversity and flood protection value. **CPO 12.52:** Ensure that all proposed land zonings take cognisance of appropriate riparian setback distances that support the attainment of high ecological status for water bodies, the conservation of biodiversity and good ecosystem health, and buffer zones from flood plains.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.53: Implement the relevant parts of the Planning and Development (Amendment) (No. 2) Regulations 2011 and the European Communities (Amendment to Planning and Development) Regulations 2011, which require planning permission to be applied for where the area impacted by works relating to the drainage or reclamation of a wetland exceeds 0.1 hectares or where such works may have a significant effect on the environment. Such applications for permission would need to be supported by an Appropriate Assessment where necessary. **Waterways Policy Objectives** It is a policy objective of Westmeath County Council to: **CPO 12.54:** Seek the continued improvement of water quality, bathing facilities and other recreational opportunities in waterways and to protect the ecology and wildlife thereof. **CPO 12.55:** Provide for public access to waterways where feasible and appropriate, in partnership with the National Parks and Wildlife Service (NPWS), Waterways Ireland and other relevant stakeholders, whilst maintaining them free from inappropriate development, subject to Ecological Impact Assessment and Appropriate Assessment, as appropriate. **CPO 12.56:** Protect the biodiversity of rivers, streams and other water courses and maintain them in an open state and discourage culverting and realignment. **CPO 12.57:** Consult with Waterways Ireland and the National Parks and Wildlife Service, Government, Inland Waterways Association of Ireland and local communities on development proposals that may affect inland waterways, rivers, lakes, canals or water courses. **CPO 12.58:** Ensure that the County's watercourses are retained for their biodiversity and flood protection values and to conserve and enhance where possible, the wildlife habitats of the County's rivers and riparian zones, lakes, canals and streams which occur outside of designated areas to provide a network of habitats and biodiversity corridors throughout the county. **CPO 12.59:** Consult, as appropriate, with Inland Fisheries Ireland in relation to any development that could potentially impact on the aquatic ecosystems and associated riparian habitats.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	CPO 12.60: Ensure that run off from a proposed development does not result in a deterioration of downstream watercourses or habitats. **CPO 12.61:** Seek to manage any increase in visitor numbers in order to avoid significant effects including loss of habitat and disturbance, including ensuring that any new projects, such as greenways, are a suitable distance from ecological sensitivities, such as riparian zones. **CPO 12.62:** Have regard to the Inland Fisheries guidelines "Planning for watercourses in the Urban Environment" in relation to nature based surface water management. **CPO 12.63:** Protect waterbodies and watercourses from inappropriate development, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains. This will include the preservation habitat features/structure, such as treeline density, and protection buffers in riverine and wetland areas, as appropriate.	
Offaly County Development Plan 2021 - 2027	**Biodiversity and Landscape Objectives** **Designated and Non-designated Sites** **BLP-01:** It is Council policy to protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity. **BLP-02:** It is Council policy to conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 (as amended) and the Flora Protection Orders. **BLP-03:** It is Council policy to support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives. **BLP-04:** It is Council policy to protect and maintain the conservation value of all existing and future Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county.	As above, the Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. A comprehensive Screening for Appropriate Assessment and Natura Impact Statement has been submitted along with this application. The Proposed Development has been designed in order to avoid loss of sensitive habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan. The Proposed Development is located outside of any Nationally designated sites, as described in Section 6.5.1.1. and no

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	BLP-05: It is Council policy to ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law. **BLP-06:** It is Council policy to consult with the National Parks and Wildlife Service, and take account of any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law. **BLP-07:** It is Council policy to support the implementation of the National Biodiversity Action Plan 2017- 2021 and the Offaly Heritage Plan Key Actions 2017-2021 and future editions in partnership with relevant stakeholders subject to available resources. **BLP-08:** It is Council policy to work with all state agencies to promote the development of all aspects of park management in the Slieve Bloom Mountains. **Waterways, Lakes and Wetland Landscapes** **BLP-19:** It is Council policy to protect the landscape associated with the River Shannon, including the Callows and views of special interest, and also to encourage the development of Shannonbridge, Banagher and Shannon Harbour as focal points. It will also be Council policy to investigate the possibility of providing a Linear Park based on the River Shannon from Banagher to Meelick, which takes account of the sensitive ecological nature of the Callows area. **BLP-20:** It is Council policy to preserve riparian buffer strips free from development by reserving a minimum of 10 metres either side of all watercourses (measured from top of bank) with the full extent of the protection determined on a case by case basis by the Council, based on site specific characteristics and sensitivities. **BLP-21:** It is Council policy to promote clear span bridging structures as the preferred option for culverts Any development proposal requiring culverting should also document stream habitat lost and provide compensatory habitat where possible. Realignment of water courses should incorporate stream enhancement measures, as outlined in Office of Public Works Environmental Guidance. The Council will consult with Inland Fisheries Ireland in relation to riparian and instream works as appropriate.	significant residual effects have been identified in relation to sites of this nature. No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified. No projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	BLP-22: It is Council policy to promote the removal of historic culverts and infilling of watercourses. BLP-23 It is Council policy to consider the Waterways Corridor Study 2002 and protect the recreational, educational and amenity potential of navigational and non-navigational waterways within the county, such as the Grand Canal Corridor, towpaths and adjacent wetland landscapes, taking into account more recent heritage and environmental legislation (including the SEA Directive) and environmental policy commitments. **Trees, Forestry and Hedgerows** **BLP-24:** It is Council policy to support the protection and management of existing networks of woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character, and to strengthen local networks. **BLP-25:** It is Council policy to encourage the planting of native species in all new residential developments (individual and multiple units) and as part of landscaping for commercial and industrial developments. **BLP-26:** It is Council policy to require, where practical, the management of mature trees, such as tree surgery instead of felling particularly where the trees contribute to amenity. Green Infrastructure Strategy **BLP-27:** It is Council policy to recognise the economic, social, environmental and physical value of green infrastructure. **BLP-28:** It is Council policy to protect existing green infrastructure within the county, to provide additional green infrastructure where possible and to encourage green infrastructure to be spatially connected to facilitate the extension or establishment of ecological corridors. **BLP-29:** It is Council policy to seek to increase investment in green infrastructure provision and maintenance by accessing relevant EU funding mechanisms and national funding opportunities. **BLP-30:** It is Council policy to integrate the provision of green infrastructure with infrastructure provision and replacement, including walking and cycling routes, as appropriate, while protecting natural heritage. **BLP-31**: It is Council policy to support the use of green infrastructure for carbon sequestration to combat climate change.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	Green Infrastructure Strategy **BLP-27:** It is Council policy to recognise the economic, social, environmental and physical value of green infrastructure. **BLP-28:** It is Council policy to protect existing green infrastructure within the county, to provide additional green infrastructure where possible and to encourage green infrastructure to be spatially connected to facilitate the extension or establishment of ecological corridors. **BLP-29:** It is Council policy to seek to increase investment in green infrastructure provision and maintenance by accessing relevant EU funding mechanisms and national funding opportunities. **BLP-30:** It is Council policy to integrate the provision of green infrastructure with infrastructure provision and replacement, including walking and cycling routes, as appropriate, while protecting natural heritage. **BLP-31:** It is Council policy to support the use of green infrastructure for carbon sequestration to combat climate change. **All Ireland Pollinator Plan** **BLP-32:** It is Council policy to support the aims and objectives of the All Ireland Pollinator Plan 2021- 2025 and any subsequent editions by delivering appropriate management actions as set out in their guidance documents. **BLP-33:** It is Council policy to support alternative landscape maintenance regimes which promote and work towards the reduction and ultimate elimination of use of herbicides in Parks and public land, while supporting the National Bee Pollinator Plan in promoting bee friendly habitats. **Invasive Species** **BLP-34:** It is Council policy to continue to deliver and support measures for the prevention, control and/or eradication of invasive species within the county, and to seek details of how these species will be managed and controlled where their presence is identified.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	Areas of High Amenity **BLP-35:** It is Council policy to protect and preserve the county's Areas of High Amenity namely the Slieve Bloom Mountains, Clonmacnoise Heritage Zone, Durrow High Cross, Abbey and surrounding area, the River Shannon, Lough Boora Discovery Park, Grand Canal, Croghan Hill, Raheenmore Bog, Pallas Lake, Clara Bog, Clara eskers, Eiscir Riada and other eskers. Notwithstanding the location of certain settlements, or parts of, for which there are settlement plans (Towns, Villages, Sráids), within the Areas of High Amenity, it is not the intention of this policy to hinder appropriate sustainable levels of development (as set out in the plans and subject to proper planning). Further, it is policy to facilitate the sustainable extension and expansion of existing visitor, tourist related or other rural enterprises within the Areas of High Amenity, where such development is appropriate and where it can be demonstrated that it gives 'added value' to the extending activity and to the immediate area which is the subject of the 'Area of High Amenity' designation. **BLP-36:** It is Council policy, to ensure that issues of scale, siting, design and overall compatibility (including particular regard to environmental sensitivities) with a site's location within an Area of High Amenity are of paramount importance when assessing any application for planning permission. The merits of each proposal will be examined on a case-by case basis. **BLP-37:** It is Council policy to support the preparation of a masterplan that conserves and protects the Clonmacnoise monastic site and will co-operate with the Office of Public Works and other stakeholders in its preparation and implementation. **High Nature Value (HNV)** **BLP-45:** It is Council policy to support and promote High Nature Value (HNV) farming projects and schemes. **Public Awareness** **BLP-46**: It is Council policy to raise public awareness and understanding of the County's natural heritage and biodiversity.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	Biodiversity and Landscape Objectives **Designated and Non-Designated Sites** **BLO-02:** It is an objective of the Council that no plans, programmes or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects[28]). **BLO-03** It is an objective of the Council that all projects and plans arising from this Plan[29] will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and subsequent Appropriate Assessment where necessary, that: **1.** The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or **2.** The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or **3.** The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out	

[28] *Except as provided for in Article 6(4) of the Habitats Directive, viz. there must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed, and c) Adequate compensatory measures in place.*
[29] *Such projects include but are not limited to those relating to: agriculture; amenity and recreation; contaminated sites; electricity transmission; flood alleviation and prevention; forestry; mineral extraction; renewable energy projects; roads; telecommunications; tourism; wastewater and discharges; and water supply and abstraction.*

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000. **BLO-04:** It is an objective of the Council to ensure that the impact of development within or adjacent to national designated sites, Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites and Nature Reserves likely to result in significant adverse effects on the designated site is assessed by requiring the submission of an Ecological Impact Assessment prepared by a suitably qualified professional, which should accompany planning applications. **BLO-05:** It is an objective of the Council in accordance with Article 4(4) of the Birds Directive and Regulation 27(4) of the European Communities (Birds and Habitats) Regulations 2011-2015 to strive to avoid pollution or deterioration of bird habitats outside Special Protection Areas. **BLO-06:** It is an objective of the Council to take account of the objective and management practices proposed in any management or related plans for European Sites (SACs and SPAs) in and adjacent to the county published by the Department including the National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 and any subsequent editions. **Waterways, Lakes and Wetland Landscapes** **BLO-12:** It is an objective of the Council to maintain a riparian zone for larger and smaller river channels based on the Inland Fisheries Ireland updated guideline document, 'Planning for Watercourses in the Urban Environment, a Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning'. **BLO-13:** It is an objective of the Council to (a) investigate the feasibility of and cooperate with relevant agencies in providing a Linear Park based on the River Shannon from Banagher to Meelick, which takes account of the sensitive ecological nature of the Callows area and (b) to support the development of an overall vision/strategy for the Shannon Callows in co-operation with all stakeholders to ensure that the area is appropriately managed at a landscape scale. **Trees, Forestry and Hedgerows**	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	BLO-14 It is an objective of the Council to preserve individual trees and groups of trees that are included in Table 4.13 and 4.14. **BLO-15:** It is an objective of the Council to consider the making of Tree Preservation Orders to protect trees and woodlands of high value. **BLO-16:** It is an objective of the Council to encourage the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, not listed in Table 4.13 and 4.14; a) in particular, on the grounds of Country Houses, Gardens and Demesnes and on approaches to settlements in the county; and b) as part of the development management process, require the planting of native, deciduous, pollinator friendly trees in all new developments where possible. **BLO-17:** It is an objective of the Council to encourage pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species. **BLO-18**: It is an objective of the Council to encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the county. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority). Green Infrastructure **BLO-19:** It is an objective of the Council to require all new developments to identify, protect and enhance ecological features by making provision for local biodiversity (for example, through provision of swift boxes or towers, bat roost sites, green roofs, etc.) and provide ecological links to the wider Green Infrastructure network as an essential part of the design process. Invasive Species. **BLO-20:** It is an objective of the Council to require, as part of the planning application process, the appropriate eradication/control of invasive species when identified on site or in the vicinity of a site, in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	BLO-21: It is an objective of the Council to continue to maintain mapping identifying the location of invasive species in the county in conjunction with the National Biodiversity Data Centre. **Wilderness Corridors** BLO-28 It is an objective of the Council to work with stakeholders such as Bord Na Móna, Coillte, National Parks and Wildlife Service, Waterways Ireland and Just Transition related groups to examine the feasibility of developing a Wilderness Corridor on rehabilitated peatlands linked to routes identified in Figure 6.13 'Midlands Cycling Destination, Offaly Network Map at; i. Cavemount, Esker, Ballycon, Derrycricket, Clonsast North, Clonsast and Derryounce Bogs in East Offaly; and ii. Blackwater, Ballaghurt and Belmont Bogs in West Offaly, from Clonmacnoise in the direction of Belmont village in West Offaly.	
National Biodiversity Action Plan 2017-2021	***Objective 1*** *Mainstream biodiversity into decision-making across all sectors* *Developments in the area of Green Infrastructure are being initiated at the local and regional level. Green Infrastructure is a strategically planned network of natural and semi natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation.* ***Objective 4*** *- Conserve and restore biodiversity and ecosystem services in the wider countryside* ***Target 6.2*** *- Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.*	There will be no adverse effects designated sites or biodiversity as a result of the Proposed Development. The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Draft 4th National Biodiversity Action Plan 2023-2027	**Objective 2 - Meet Urgent Conservation and Restoration Needs** **Outcome 2A:** The protection of existing designated areas and species is strengthened and conservation and restoration within the existing protected are network are enhanced 29 **Outcome 2B:** Biodiversity and ecosystem services in the wider countryside are conserved 32 18 27 Navigation **Outcome 2C:** All freshwater bodies are of at least 'Good Ecological Status' as defined under the EU Water Framework Directive 36 **Outcome 2D:** Genetic diversity of wild and domesticated species is safeguarded 39 Outcome 2E: A National Restoration Plan is in place to meet EU Biodiversity Strategy 2030 nature restoration targets 41 **Outcome 2F:** Biodiversity and ecosystem services in the marine environment are conserved and restored 42 **Outcome 2G:** Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment	There will be no adverse effects on designated sites or biodiversity as a result of the Proposed Development. The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition. No Invasive species were present within the Site, and the proposed development will not contribute to the spread of invasive species.
Eastern and Midlands Regional Assembly: Regional Spatial & Economic Strategy 2019-2031 (RSES)	**RPO 7.16:** Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans. **RPO 7.17:** Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species. **RPO 7.18:** Work with local authorities and state agencies to promote the development of all aspects of park management in the Wicklow National Park and the Slieve Bloom Mountains. **RPO 7.19:** Support the consideration of designating a National Park for the peatlands area in the Midlands.	There will be no adverse effects on biodiversity as a result of the Proposed Development, and no cumulative impacts in this regard. The Proposed Development has been designed to avoid any effects on water quality and/or designated sites outside the site. The Proposed Development will be subject to a full environmental assessment i.e. EIA and AA.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	RPO 7.20: Promote the development of improved visitor experiences, nature conservation and sustainable development activities within the Dublin Bay Biosphere in cooperation with the Dublin Bay UNESCO Biosphere Partnership.	

6.8.2 Assessment of Projects

As described in Section 2.7 of Chapter 2 of the EIAR, relevant projects have been assessed in-combination with the Proposed Development and include planning applications in the vicinity of the site including other wind energy applications within the appropriate zone of sensitivity (see Section 2.7 Chapter 2. Appendix 2-3 to Section 2 of this EIAR provides the full list of projects identified; these have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in the assessment with further detail provided below. In addition, Section 6.7.2.2 concludes on their potential for impact on biodiversity. Table 6-29 below provides the cumulative study areas for individual EIAR topics that are also relevant in relation to ecological receptors i.e. hydrological connectivity is important for assessing potential for effects on designated sites. Potential for cumulative effects in relation birds is assessed separately within Chapter 7 of this EIAR.

Table 6-8: Cumulative Study Areas in relation to ecological receptors (birds are assessed separately within Chapter 7 of this EIAR)

Individual Topic	Maximum Extent	Justification
Biodiversity	1km from Wind Farm Site Boundary. 200m from Grid Connection underground electrical cabling route. Consideration for the Biodiversity cumulative extent is also given to the Birds and Water Cumulative geographical boundaries.	Using the precautionary approach and given the nature and scale of the Proposed Development, the geographical boundary for terrestrial ecological aspects, i.e. habitats, is 1km for cumulative assessment for the Wind Farm Site and 200m from Grid Connection underground electrical cabling route.
Water	**Wind Farm Site:** Upper and Lower Shannon Catchment for proposed, permitted or existing wind-farm developments River Sub Basins for all smaller proposed, permitted or existing plans or projects (i.e. private and commercial type developments). **Grid Connection:** Within a 200m buffer zone of the proposed underground electrical cabling connection route.	Regional surface water catchments are used for cumulative impact assessment with regard large infrastructural developments such as wind farms, energy and public transport developments. The potential for cumulative effects for these developments likely exists on a regional catchment scale (i.e. significant works likely existing in several sub-basins). Therefore, other wind-farm developments are considered within the Shannon Catchment for cumulative effects. River Sub Basins are used for smaller developments (i.e. private & commercial type developments). These developments are not likely to present a significant cumulative impact risk on a regional catchment scale as any effects would likely be imperceptible as a result of the setback distances and localised nature of the associated works. Given the nature and scale of the proposed works and the lack

		of hydrological cumulative impact potential beyond the river sub basin scale, the Water cumulative study area is defined by river sub basins in which the Wind Farm Site is located. Due to the narrow nature of the underground electrical cabling route trench (~0.6m wide), a 200m buffer zone is an appropriate scale when considering potential cumulative effects on the water environment.

Other smaller developments within the wider study area have been considered within the identified zone of sensitivity for biodiversity i.e. 1km radius of the Site, as described in Section 2.7.2 of this EIAR, have been considered within this cumulative impact assessment. A list of projects considered in the cumulative assessment is contained within Appendix 2-3 of this EIAR; In order to avoid repetition within the EIAR, these have not been repeated below.

6.8.2.1 Other Wind Farm Projects

For the purposes of this cumulative assessment wind farms within the Upper and Lower Shannon Catchment (in addition to a 1-kilometre radius of the Proposed Development area) have been considered in further detail below. Wind farms occurring at greater distances were considered, however, given the nature of the KERs identified within the EIAR survey area (potential for cumulative effects on birds are considered within Chapter 7 of this EIAR) and that no significant residual effects were identified, further detailed analysis is not provided below.

There are 9 no. wind farm developments operational, consented or proposed, that have been identified due to either an application, a request for pre-application consultation having been lodged or permitted, or proposed wind farm projects identified in the Public Domain within the cumulative study area.

- Lemanaghan (Pre-Application Phase – ABP 310844) – 13-17 turbines
- Leabeg Wind Farm (Existing) – 2 turbines
- Coole Wind Farm (Significant FI requested) - 15 turbines / (Granted 27/03/2019 (subject to Judicial Review)) – 13 turbines
- Derrinlough (Granted) – 21 turbines
- Cloghan (Granted) – 9 turbines
- Kepak (FI requested) – 1 turbine
- Lissanore (FI received) – 1 turbine
- Derryadd (Pre-Application Phase – ABP 314965) – 25 turbines

Further details of these projects are provided within Appendix 2-3 to Section 2 of this EIAR.

6.8.2.1.1 *Lemanaghan Wind Farm*

The site proposed for Lemanaghan Wind Farm is c. 18.2km south of the proposed turbines within the Wind Farm Site.

The project is at the pre-application stage, and no specific information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the Proposed Development when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.2 Leabeg Wind Farm

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Leabeg Wind Farm project which is located c. 25km south of the proposed turbines within the Wind Farm Site was considered. No specific information regarding potential residual effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the Proposed Development when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.3 Coole Wind Farm

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Coole Wind Farm project, which is located 34km northeast of the proposed turbines within the Wind Farm Site was considered. The planning file was reviewed on the ABP case viewer and the NIS[30] for the project consulted. The NIS concluded that '*Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the Proposed Development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects*'. Based on the information available in the Coole Wind Farm NIS, significant cumulative impacts in combination with the proposed development are not anticipated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.4 Derrinlough Wind Farm

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Derrinlough Wind Farm project, which is located 32km northeast of the proposed turbines within the Wind Farm Site was considered. The planning file was reviewed on the ABP case viewer and the NIS[31] for the project consulted. The NIS concluded that '*Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the proposed development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.*' Based on the information available in the Derrinlough Wind Farm NIS, significant cumulative impacts in combination with the Proposed Development are not anticipated.

[30] *MKO (2021), Natura Impact Statement, Coole Wind Farm, County Westmeath.*
[31] *MKO (2020), Natura Impact Statement, Derrinlough Wind Farm, County Westmeath.*

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.5 Cloghan Wind Farm

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Cloghan Wind Farm project, which is located 33km to the south of the proposed turbines within the Wind Farm Site, was considered. The planning file was reviewed on the Offaly County Council planning viewer and the NIS[32] for the project consulted. The NIS concluded that '*Taking into account of the mitigation measures proposed for the avoidance and reduction adverse effectson the qualifying interests and conservation objectives of the designated Natura 2000 sites within the study area it is concluded that the proposed Cloghan Wind Farm development will not result in direct, indirect or cumulative impacts which would have the potential to adversely affect the qualifying interests/ special conservation interests of the Middle Shannon Callows SPA, All Saints Bog SPA, Dovegrove Callows SPA, Little Brosna Callows SPA, River Suck Callows SPA and Mongan Bog SPA with regard to the range population densities or conservation status of the habitats and species for which these sites are designated... It is considered that the proposed wind farm development, in addition to the implementation of the prescribed mitigation measures, would not give rise to significant impacts affecting the integrity of any designated site within the Natura 2000 network*'. Based on the information available in the Cloghan Wind Farm NIS, significant cumulative impacts in combination with the Proposed Development are not anticipated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.6 Kepak Wind Farm

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Kepak Wind Farm project, which is located 18km to the southeast of the proposed turbines within the Wind Farm Site, was considered. The planning file was reviewed on the Westmeath County Council planning viewer and the AASR[33] for the project consulted. The AASR concluded that '*As the effects that could arise from the Plan have been examined in the context of several factors that could potentially affect the integrity of any European Site(s). On the basis of the findings of this Screening for AA, it is concluded that the proposed development:*

- *Is not directly connected with or necessary to the management of any European Site*
- *And will not have adverse effects on the integrity of the Split Hills and Long Esker SAC*

Therefore, in conclusion a Stage 2 AA is not required for the proposed development. On the basis of this screening assessment which determined that, in view of the best scientific knowledge potential likely significant effects from the Proposed Development can be ruled out for the Split Hills and Long Esker SAC, in view of the conservation objectives of this European Site. A stage 2 (Appropriate Assessment) is therefore not required to assist the competent authority (Westmeath County Council) in undertaking an Appropriate Assessment of the potential for adverse effects from the Proposed Development, alone or in combination with other plans and projects, on the integrity of this European Site.'

[32] *Ecofact Environmental Consultants (2014), Natura Impact Statement, Cloghan Wind Farm.*
[33] *VEON (2022), Article 6(3) Appropriate Assessment Screening Report, Wind Turbine Installation, Kepack, Kilbeggan, Co. Westmeath.*

Based on the information available in the Kepak Wind Farm AASR, significant cumulative impacts in combination with the Proposed Development are not anticipated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.7 *Lissanore Wind Turbine*

The potential for the Proposed Development to result in significant cumulative effects when assessed alongside the Lissanore Wind Farm project, which is located 18km to the southeast of the proposed turbines within the Wind Farm Site, was considered. The planning file was reviewed on the Westmeath County Council planning viewer and the AASR[34] for the project consulted. The AASR concluded that '*The first stage of the Appropriate Assessment process, screening, has been completed in compliance with the relevant European Comission and national guidelines... The Screening Assessment undertaken for the proposed 4.2MW wind turbine at Lissanore, Co. Longford in Section 4.3 above has determined that the proposed development presents no risk of giving rise to any significant or other impacts within any European Designated Conservation Areas'*.

Based on the information available in the Lissanore Wind Farm AASR, significant cumulative impacts in combination with the Proposed Development are not anticipated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.1.8 *Derryadd Wind Farm*

The site proposed for the Derryadd Wind Farm project is c. 18.2km south of the proposed turbines within the Wind Farm Site.

The project is at the pre-application stage, and no specific information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the Proposed Development when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Development. Taking into consideration also the fact that no significant residual effects on European Sites have been identified for the Proposed Development (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.2 Non-Renewable Energy Developments

Appendix 2-3 of this EIAR lists non-renewable energy development existing and approved projects as well as planning applications pending a decision within approximately 1km of the proposed locations of turbines within the Proposed Development in relation to Biodiversity (and within river sub basins in relation to Water, see Section 9.5.5, Chapter 9 of this EIAR). Here a 1km distance from the proposed Wind Farm development has been considered for operational and construction purposes as an appropriate buffer to identify potential sensitive receptors and cumulative projects in the non-renewable energy category that should be considered in the context of the Proposed Development. This distance

[34] *EirEco (2022), Appropriate Assessment Screening Report for Single Wind Turbine at Lissanore, Co. Longford.*

was considered to be proportional to the likely zone of influence of the developments listed below, which are relatively small-scale. Smaller projects within river sub basins have been considered specifically in relation to potential for cumulative effects on desginated sites.

A review of all projects (existing and permitted) within 200 meters of the Grid Connection route has also been completed. Given the narrow nature of the underground electrical cabling route trench (~0.6m wide), the 200 meter distance from the Grid Connection route reflects a generous and conservative range in terms of identifying permissions which may have the potential for cumulative effects having regard to the nature of the Grid Connection works (i.e. construction and operation of underground cabling) in relation to Biodiversity and Water. Appendix 2-3, Chapter 2 of this EIAR lists those existing and approved projects as well as planning applications pending a decision identified within 200 meters of the Grid Connection works.

A total of 422 planning applications have been identified within 1km of the Wind Farm Site and within the sub-basin zone. More than 95% of these applications are for new dwellings or renovations of existing dwellings, as well as for the erection of farm buildings. The other non-dwelling/farm related planning applications include 1 no. planning applications for a replacement of a 15m telecommunications pole with a 21m telecommunications pole (PL 21656) near Ballymore and an above ground water storage reservoir (3150m^3) is also included in the assessment (PL 187011). The planning applications have been reviewed based on their type, scale and proximity to the proposed Wind Farm Site. Based on the scale of the works, their proximity to the Proposed Development and the temporal period of likely works, no cumulative effects will occur as a result of the Proposed Development.

A desk study of planning applications within 200m of the underground electrical cabling connection route was undertaken. 81 no. planning applications were identified during this study. Again, the majority of applications relate to the construction or renovation/extension of domestic dwellings, which will not generate potential cumulative effects due to their scale.

3 no. solar farms were identified within Offaly/Westmeath situated within 200m of the proposed underground electrical cabling connection. These include a 10 year permission for a solar farm on lands adjacent to the N52 near the townland of Gormagh (PL 22387), a 10 year permission for a solar farm at Dawn Meats near Kilbeggan (PL 22350) and a 10 year planning permission for the construction of a solar farm in the townland of Derries, Co. Offaly, of which the approved underground electrical cable is situated within 200m of the underground electrical cabling route of the Proposed Development. As the construction of the underground electrical cabling connection will be a relatively short construction project, which will be broken up into sections of ~100 to 150m works length (meaning that only ~100m of open trench will exist at any one time during the construction), the potential for cumulative effects with these nearby energy developments are not significant from a hydrological/hydrogeological perspective. It is also likely that the construction phases of these projects will not overlap with the construction phase of the proposed development, within the buffer zone. The construction of the underground electrical cabling connection route for the proposed development would be subject to a Road Opening License, as would any other similar nearby grid connection works. The timing of these works would therefore be controlled by the road opening licensing process and would not overlap.

6.8.2.3 Existing Habitats and Land Uses

The potential for the Proposed Development to result in a cumulative loss or deterioration of habitats, or impact on the KER species identified, was considered in relation to the existing land uses in the area.

The Proposed Development is located primarily on improved agricultural grassland (GA1) habitats, which generally provide low value habitats for faunal species. The loss of hedgerow and treeline that will be affected, will be fully mitigated through habitat enhancement and restoration proposed as part of this development. The Proposed Development will not contribute to any overall loss of high value habitat within the locality, it has been deliberately designed to be located on habitats of low value for

faunal species. There is no therefore no potential for significant in-combination impacts in relation to existing habitats and land uses.

6.8.3 Assessment of Cumulative Effects

The Proposed Development has been considered cumulatively with other plans and projects as described in Sections 6.8.1 & 6.8.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Development and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 6.7, it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality etc., associated with the Proposed Development and therefore it cannot contribute to any cumulative effect when considered in combination with other plans and projects. The other wind farms in the area were considered (among other projects) but the Proposed Development has been deliberately designed to minimise the effects on biodiversity through the siting of the Proposed Development on habitats of low ecological value. Following bespoke mitigation there will be no significant residual impacts on ecological receptors associated with the Proposed Development and therefore no potential for individual or cumulative negative effects on biodiversity are likely to occur.

No significant residual effects as a result of the Proposed Development in relation to disturbance, displacement or mortality of faunal species has been identified. Therefore, there is no potential for the Proposed Development to contribute to any cumulative effect in this regard.

The Proposed Development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects.

In the review of the projects and plans that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Development.

6.9 Conclusion

The site is located within fields that mostly comprise improved agricultural grassland (GA1) of low ecological value with a network of hedgerows (WL1) treelines (WL2) and drainage ditches (FW4). A number of watercourses occur within the Wind Farm Site and along the Grid Connection underground electrical cabling route. Potentially significant effects on the Key Ecological Receptors identified in this report have been avoided through infrastructure siting, project design and mitigated by the implementation of specific mitigation measures as detailed in Section 6.7 of this chapter; including all references made to mitigation specified in Chapters 4 ‘Development Description’, Chapter 9 ‘Water’ and within the CEMP Appendix 4-2 to Chapter 4 of this EIAR.

Where loss of hedgerow and trees has been identified and is unavoidable, appropriate mitigation, compensation and management measures have been incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan (see Appendix 6-4)

Faunal species records within the EIAR survey area, during detailed ecological surveys undertaken between 2020 and 2022, were found to be common and widespread in the wider area, and in a National context. Protected species such as bats, badger and pine marten were identified within the site boundary and bespoke avoidance and mitigation measures have been implemented to ensure that no significant effects will occur. In addition. a number of standard best practice and bespoke mitigation measures have been incorporated into the project for the avoidance of impact on protected species as a result of disturbance/displacement and water quality deterioration. The implementation of these measures in full will ensure compliance with the Wildlife Act.

Taking the above information into consideration and having regard to the precautionary principle, the Proposed Development will not result in a residual loss of any habitat of high ecological significance and will not have any significant impacts on the ecology of the wider area.

Provided that the Proposed Development is constructed, operated and decommissioned in accordance with the design, best practice and mitigation that is described within this application, significant effects on biodiversity are not anticipated at any geographic scale.