



Chapter 19 Schedule of Mitigation

Ballinlee Wind Farm

Ballinlee Green Energy Ltd.

September 2025

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Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
22635	6006	A	18/09/2025	SO'D	AO'C	KF	Final

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19. Schedule of Mitigation Measures

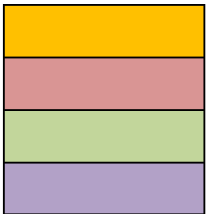
19.1 Introduction

This Schedule of Environmental Mitigation summarises and sets out an implementation plan for all environmental mitigation measures included in the **Environmental Impact Assessment Report (EIAR)** for the proposed development in east County Limerick. Further information on the project description is provided in **Chapter 02** Description of the Proposed Development.

19.2 Methodology

The schedule on the following pages is structured in accordance with the following project phases:

- Prior to Commencement of Construction;
- During Construction Phase;
- Post Construction/Operational Phase; and
- Decommissioning.



The schedule is presented in a Table format which outlines, for each of the project phases:

- I. The environmental aspect or resource for which mitigation is required;
- II. The required or proposed mitigation measure to undertake/implement;
- III. The persons responsible for implementing the mitigation; and
- IV. The relevant actions, procedures and plans relating to implementation of the mitigation.

Table 19-1: Schedule of Environmental Mitigation Measures

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Appendix 2A	Construction Environmental and Management Plan (CEMP)	A Construction Environmental Management Plan (CEMP) has been prepared for the project and will be implemented during construction in order to ensure that the project is constructed in accordance with best practice, with the minimum effects on the surrounding environment. The implementation of proposed mitigation measures, environmental commitments of the project and the monitoring and supervision of these measures will be managed through the CEMP which can be found in EIAR Volume III, Appendix 2A. It includes, but is not limited to, measures to control/manage various elements of the development including the following: • Management of Excavations • Surface Water Management and Run-off Control • Fuels and Oils Management • Management of Concrete • Construction Noise and Vibration Management • Construction Waste Management Plan • Construction Traffic Management Plan • Construction Dust, Emissions and Air Quality Management • Ecological Management Plan for the Protection of Habitats and Fauna • Management of Invasive Species • Archaeological and Heritage Protection • Emergency Response Plan • Site Environmental Training and Awareness • Monitoring and Auditing • Environmental Accidents, Incidents and Corrective Actions • Environmental Complaints Construction method statements will be prepared prior to commencement of construction and incorporated into the CEMP.	Developer Principal Contractor and Responsible personnel identified in the CEMP
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Appendix 2A	Construction Environmental and Management Plan (CEMP)	The Construction and Environmental Management Plan will be further updated and finalised by the appointed Contractor in advance of works commencing and will be submitted to the local authority(s) for approval. Construction method statements will be prepared prior to commencement of construction and incorporated into the CEMP.	Principal Contractor and Responsible personnel identified in the CEMP

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Appendix 2D	Grid Connection Route Report (GCRR)	A topographical survey was required at areas of congestion and in addition all watercourse crossings along the grid connection route were surveyed. This method allowed for the identification of the watercourse crossings invert/obvert levels and the road level at the crossing location. This information informed the crossing methods. Additionally, the Topo survey identified the street furniture and the boundary between public and private land which aided in the alignment of the grid connection route.	Appointed Project Manager
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Appendix 16A	Traffic Management Plan (TMP)	A final TMP will be prepared by the Principal Contractor. It will take account of the measures specified in the TMP submitted with the planning application, and any measures agreed with the relevant authorities.	Principal Contractor
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 06 Biodiversity	Best Practice	A suitably qualified Ecological Clerk of Works (ECow) will be appointed prior to the commencement of construction works, to ensure the mitigation measures outlined in Chapter 06 Biodiversity , and in Volume III Appendices 6I (HSMP) and 2A (CEMP) of this EIAR are implemented during the construction phase of the development. The appointed ECow will deliver a toolbox talk to all contractors, including sub-contractors, prior to construction starting on ecologically sensitive features within or in close proximity to the works area.	Developer
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 06 Biodiversity	Pre-Construction Surveys	Prior to construction both terrestrial and aquatic surveys will be undertaken. A pre-construction assessment of hedgerows and tree lines adjacent to the works corridor, targeting sections that will be retained post-construction, will be undertaken by an appropriately qualified arboriculturist. Root Protection Areas (RPA), will be implemented in line with BSI (2012) at locations where construction activities, including excavation, access and storage of materials, will be limited, to avoid adverse effects on the health of tree/shrubs adjacent to the area of construction works It is acknowledged that the distribution of badger resting places can change over time. Therefore, in order to avoid accidental disturbance during the construction phase of the Development, pre-construction	Design Team and project ecologists/Developer Project Manager Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			surveys for badger will be undertaken by a suitably experienced ecologist within 50 m of the Planning Application Boundary as well as areas where active and inactive setts were recorded. In line with NRA Guidelines (NRA, 2005b), this survey zone will be expanded to 150 m from areas where blasting may occur, particularly where the proposed turbines will be located. The aim of the surveys is to identify the resting sites of protected mammals and implement appropriate exclusion zone buffers, if required. For any setts identified during pre-construction surveys within 50 m of the works corridor or within 150 m of any areas requiring blasting, monitoring will be undertaken using trail cameras to confirm the status of the sett in line with NRA (2005b) guidelines. Baseline surveys found eight badger setts within the development site. Two setts will be directly impacted and will be removed to facilitate the development. Sett closures and the provision of up to two artificial setts will be undertaken in accordance with Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (NRA, now TII, 2006). <u>Badger sett removal</u> • Monitor for a minimum 5 days, using trail cameras, light sticks or sand pads, prior to any sett closure works to determine the level of activity. • Sett closure (exclusion works) will only be undertaken within the period July to November inclusive in any given year in order to avoid the badger breeding season. • Erect a chain link or sheep net fence around the sett entrances at a distance of 5 m. Fence to be dug into the ground by a minimum of 30 cm and to be a final height of a minimum of 1 m from the ground surface. • Install a one-way badger gate (using a make with a proven track record in badger sett closures and obtained through an appropriate wildlife management or ecological equipment supplier) into the fence fabric. • Gates will be left installed, with regular inspections, over a minimum period of 21 days (including period with gates tied open) before the sett is deemed inactive. • Sett destruction will commence immediately following the 21 day exclusion period, provided that all badgers have been excluded. Leave fence and gate in place until such time as the area around the sett is fully stripped of overburden (soil and	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			aggregate surrounding the sett) before commencing sett destruction. <u>Provision of artificial badger setts</u> Up to two artificial setts will be constructed. If sett 3 continues to be inactive, the provision of a replacement artificial sett may not be required. - The construction of an effective artificial sett will be undertaken by an experienced specialist in this area. - Artificial setts will be constructed within relatively close proximity to the affected group's territory, and outside the ZoI of the Development, to maximise habitation. - The constructed tunnel and chamber system will be located in well-drained soils, and be landscaped and planted to ensure cover and lack of disturbance. A due diligence ecological walkover survey will be undertaken prior to commencement of construction to identify and resting sites of pine martin and implement appropriate exclusion zone buffers, if required. Pre-construction surveys will be undertaken for amphibians to avoid mortality to breeding common frog or smooth newt. If either are confirmed to breed within the Development, consultation with the NPWS will be undertaken. Pre-construction surveys will be undertaken by a suitably experienced ecologist at watercourse crossings, including along the GCR, where suitable habitat for otter is present. This will ensure no holts or resting places occupy the works area and 150 m on either side of the works area. Pre-construction surveys for otter will be undertaken in line with NRA guidelines (2008). If any active otter holt is recorded, the following mitigation will apply: - No works will be undertaken within 150 m of otter holts with breeding females or cubs. - No wheeled or tracked vehicles will be used within 20 m of active, non-breeding otter holts. - No light works will be undertaken within 15 m of active, non-breeding holts.	
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 06 Biodiversity	Biodiversity – Invasive Species	The following three invasive plant species were recorded Japanese knotweed, giant rhubarb and winter heliotrope. Japanese knotweed and giant rhubarb are Third Schedule invasive species and were identified within the Development. It is an offence to cause the spread, or	Project Ecologist

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			introduction, of Japanese knotweed and giant rhubarb. Winter heliotrope is a low impact species and is not listed on the Third Schedule. Measures are included in the HSMP to avoid the spread of invasive species and to treat invasive species within the Planning Application Boundary. Best practice guidelines will be employed during construction to ensure that invasive plant species are not spread. This will include the establishment of demarcation zones and, where feasible, treatment of invasive species. See a summary below and Appendix 6I HSMP for invasive species bio-security measures. <u>Treatment of Japanese knotweed</u> • Japanese knotweed will be fenced off with a perimeter of no less than 10m or at the point where they adjoin roads or built infrastructure, whichever is nearest; • Signage will be placed on these areas to clearly state no entry of any kind is permitted during and after treatment; • All footwear and equipment will be cleaned prior to arrival to and upon departure from areas infested with Japanese knotweed; • Chemical treatment should be implemented by either a contracted invasive species control specialist or the relevant competent authority, and per Appendix 6I HSMP. <u>Treatment of giant rhubarb</u> • Giant rhubarb will be fenced off with a perimeter of no less than 10m or at the point where they adjoin roads or built infrastructure, whichever is nearest; • Signage will be placed on these areas to clearly state no entry of any kind is permitted during and after treatment; • All footwear and equipment will be cleaned prior to arrival to and upon departure from infested areas; • Chemical treatment should be implemented by either a contracted invasive species control specialist or the relevant competent authority, and per Appendix 6I HSMP. <u>Treatment of winter heliotrope</u> According to NRA guideline (2010), the physical treatment of low impact species like winter heliotrope is often challenging due to the risk of reinfestation and further spread, and only practical where infestations are limited in extent. Where this is the case, entire stands of winter heliotrope will be excavated and buried (to a depth of 2 m), incinerated or disposed of at an appropriately licensed waste facility. This may require follow up treatments by herbicide. Due to the risk of reinfestation a number of	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			follow up visits will be required over a two-year period to identify any regrowth. Where larger stands occur an application of glyphosate-based herbicide will be applied using a weed wipe applicator or spot treatment (Note: In accordance with the Plant Protection Product Regulations, only those Plant Protection Products authorised for professional use in Ireland will be employed).	
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 06 Biodiversity	Biodiversity – Baseline Water Quality Monitoring	Field surveys comprising an evaluation of aquatic habitats, fish assessments and biotic assessment using aquatic macroinvertebrates, as well as on-site physico-chemical water quality measurements. Biological sampling and water quality indices were used to evaluate watercourses at selected locations. Aquatic field work was carried out on 15 th and 18 th of July and 27 th of September 2022. GCR aquatic surveys were undertaken on 16 and 17 January 2025. Full details on the methods used to survey the aquatic ecology are provided in Appendix 6F Aquatic Ecology and Fish Report.	Appointed Project Contractor
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 06 Biodiversity	Protection of Fauna	Bats The most recent guidelines from NatureScot (2021) bat surveying recommend that ‘... features that could support maternity roosts and significant hibernation and/or swarming sites (both of which may attract bats from numerous colonies from a large catchment) within 200 m plus rotor radius of the boundary of the proposed development should be subject to further investigation’. Preliminary roost assessment (PRA) surveys were undertaken in August 2023 aided with the use of endoscopes, thermal inspection cameras and high-powered torches. Ground-level tree assessment (GLTA) surveys were completed in February 2024. Surveyors utilised the preliminary roost assessment criteria described in Collins (2023¹), which provides guidelines for assessing potential suitability of structure and habitat features as bat roosts, and to assess habitat suitability for foraging bats. This allows surveyors to classify the roosting and habitat suitability for bats in the study area. All potential	Project Ecologist

¹ Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			roost assessment surveys were carried out by trained and experienced bat surveyors under license from the NPWS. Pre-construction surveys will be undertaken by a suitably experienced ecologist of trees categorised as PRF-I and one as PRF-M which will be felled. As all PRFs have been acknowledged as a potential roost, felling will be undertaken outside the activity season (May to September inclusive) or the hibernation season (October to March inclusive).	
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 07 Ornithology	Ornithology – Pre-Construction Bird Survey	Baseline ornithology surveys were conducted over a three-year period from October 2021 to September 2024, in accordance with NatureScot² (2017) guidance, which is widely regarded as best practice in Ireland despite being developed for Scotland. Survey methods are detailed in the Baseline Ornithology Report (Appendix 7B) and summarised below. Surveys were completed within the Study Areas, which were determined by the 'Core Study Area' i.e. a 500 m buffer of the proposed turbine locations, and additional suitable buffers in line with NatureScot (2017) guidance applied. The core study area was defined as any land where turbines could potentially be located, surrounded by a 500 m buffer. Study Areas, were therefore as follows: • Vantage Point (VP) Study Area – The core study area; • Breeding Bird Survey Study Area – The core study area; • Breeding Raptor Study Area – The core study area and a 2 km buffer; • Barn Owl Study Area - The core study area and a 1 km buffer; • Winter Walkover Study Area - The core study area; • Wintering Waterbird Study Area - The core study area and a 5 km buffer; • Hen Harrier Roost Study Area - The core study area and a 2 km buffer; • Whooper Swan Study Area – The core study area and a 2 km buffer.	Developer Project Manager and/or Appointed Project Contractor

² NatureScot (formerly Scottish Natural Heritage). (2017). Assessing the Impacts of Wind Farms on Birds and Bats: Guidance for Statutory Nature Conservation Bodies, Developers and Consultants. NatureScot, Edinburgh. <https://www.nature.scot/professional-advice/planning-and-development/environmental-impact-assessment-eia/wind-farms-and-birds>

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			All enhancement works as part of the Whooper Swan Management Plan (e. reseeding, fencing, field amalgamation, and water scrape creation) will be completed prior to the commencement of construction to allow swans to become habituated to the improved habitat. If swan usage of fields within 200 m of turbines is recorded prior to construction, temporary deterrents (e.g. bird-scaring lines, acoustic deterrents, visual flags) will be deployed to dissuade feeding in areas at future collision risk. These will be monitored to prevent displacement to less secure or less visible areas. Scrub removal and minor drainage works will be undertaken prior to the first arrival of wintering swans (i.e., by early October), to maximise attractiveness of the enhanced fields and minimise construction-phase overlap.	
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 08 Land and Soils	Land and Soils	The implementation of erosion and sediment controls will be made prior to the commencement of site clearance works. Silt traps, such as geotextile membrane, will be placed in the existing drainage network prior to construction work. These will be inspected regularly and in the event of major rain events to ensure their performance adequacy, by a suitably qualified and experienced civil / structural engineer / ECoW and cleaned regularly as required. The Contractor's method statements for each element of work will be reviewed and approved by the engineer prior to site operations. Prior to excavation, drains will be established to effectively intercept overland flow prior to earthworks.	Appointed Project Contractor/civil/structural engineer/ECoW
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 09 Water	Water	A site-specific flood risk assessment (SSFRA), developed by MWP (MWP, 2025) (Appendix 9B), assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding for the site and Proposed Development. The SSFRA (MWP, 2025) concludes that the substation and majority of the 17 wind turbines are located within Flood Zone C, which has a low risk of flooding (<0.1% annual exceedance probability of 1 in 1,000). 4 of the 17 no. turbines are located within Flood Zone A/Flood Zone B, therefore having a high to medium probability of flooding during the 1% and 0.1% AEP events respectively. To ensure that there is no unacceptable flood risk, the following mitigation measures will be	Appointed Project Contractor/civil/structural engineer

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			implemented. The design flood level for the proposed substation is the 0.1% AEP MRFS flood level plus 500mm freeboard. The design flood level for the proposed 17 no. turbines is the 1% APE MRFS flood level plus 300mm freeboard. It was concluded that, with the implementation of the proposed mitigation measures, the proposed development will not have an adverse impact on flooding elsewhere. Residual risks associated with the development were also assessed and are considered to be acceptable. As part of pre-construction activities, a trigger warning system to be activated in the event of a flood event during construction will be designed.	
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 14 Cultural Heritage	Archaeology/Cultural Heritage	- A geophysical survey will be undertaken of targeted areas of the proposed Ballinlee Wind Farm development under licence issued by the National Monuments Service (NMS). Thirteen targeted areas are proposed to undertake geophysical survey and will be agreed following consultation / liaison with the Limerick City & County Council Archaeologist. - Following the results of the geophysical survey, a program of archaeological test excavation trenching, under licence from NMS, will be undertaken to establish the veracity of anomalies recorded in the geophysical survey. - Furthermore, archaeological test excavations will also be undertaken on the footprints of the core wind farm components within the planning boundary. The scope of the test excavations will be agreed following consultation / liaison with the Limerick City & County Council Archaeologist. - If during the proposed archaeological testing and monitoring, previously unrecorded sites/features are discovered, then preservation 'in situ' or preservation by record will be proposed. - Development buffer zones will be established (reflecting the Zones of Notification) for all existing recorded monuments where the ZON's expand into the planning boundary. These buffer zones will be physically established on the ground by the project archaeologists prior to the construction phase.	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 15 Shadow Flicker	Shadow Flicker	A shadow flicker assessment will be carried out prior to the Construction phase. This involves the identification of houses and other sensitive receptors within a defined study area, which have the potential to be adversely impacted by shadow flicker. In line with best practice guidance, the study area is usually limited to a distance (between a house and wind turbine) equivalent in length to 10 of the proposed wind turbine rotor diameters. Determining shadow flicker based on using the 10 rotor diameter rule has been widely accepted across different European countries and is deemed to be an appropriate assessment area (Parsons Brinckerhoff, 2011). Computer software will be used to predict the occurrence of shadow flicker at each house within the study area, which is known to over-estimate the possible impact. The results will be compared against the criteria in the existing 2006 Wind Energy Development Guidelines and the 2019 Draft Revised Wind Energy Development Guidelines.	Developer Project Manager
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 16 Material Assets - Traffic and Transportation	Traffic and Transportation	A pre-construction bridge and road survey will be carried out on the haul route on the R516, which will be monitored on a regular basis and any damage rectified promptly.	Site Environmental Manager
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Chapter 17 Material Assets - Built services	Residential Amenity/Material Assets	Mitigation by design has been adopted whereby the grid connection methodology at the proposed development has been selected to utilise existing built infrastructure. All electrical and other services within the public road will be identified prior to construction of the 110kV underground grid route cable. Pre-construction surveys will be completed to avoid disturbance to existing watermains. A pre-construction assessment of hedgerows and treelines adjacent to the works corridor, targeting sections that will be retained post-construction, will be undertaken by an appropriately qualified arboriculturist.	Developer Project Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
DURING CONSTRUCTION	Chapter 05 Population and Human Health	Public Safety	While there is the potential for construction-related hazards, serious risks to human health and safety are not envisaged. During construction, the site will be managed in accordance with the following safety and health regulations and guidelines which will ensure a high standard of safety both for workers on site and the general public: • Safety, Health & Welfare at Work (Construction) Regulations 2013 as amended; • Safety, Health & Welfare at Work Act 2005 as amended; • Safety, Health & Welfare at Work (General Applications) Regulations 2007 as amended; and • Irish Wind Energy Association (IWEA) Best Practice Guidelines 2012. A Safety and Health Plan covering all aspects of the construction process will be prepared in advance of construction and will comprehensively deal with safety and health related issues.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 05 Population and Human Health	Traffic and Road Usage	Potential impact on the surrounding road network will arise principally during the construction phase, impacts will therefore be temporary in nature. Peak heavy vehicles volumes generated by the delivery of construction materials is predicted to be 142 vehicles per day. Construction traffic will occur outside the peak morning and evening peak commuter traffic and that any construction phase impacts would be temporary in nature. The grid connection will require a stop/go alternating direction traffic management arrangement. The Appointed Contractor(s) will prepare a detailed Traffic Management Plan prior to the works commencing. This Plan will be finalised in agreement with An Garda Síochána and Limerick City & County Council. The plan will include provision for: • Communicating with the community, An Garda Síochána and Limerick City & County Council. • Details of site access and any site traffic rules, including security, parking, loading and unloading, required speed or other relevant details. • Details of the turbine component delivery and any road closures. • Programme of maintenance and upkeep of public roads. • Site operating hours (including delivery) to be outlined.	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			- In order to mitigate from a significant impact during peak traffic hours, the majority of staff will either arrive on-site before or after the peak morning traffic and finish work before or after the evening peak traffic hours. - The condition of the public roads will be monitored on an on-going basis and a road sweeper provided to clean the public roads if required. - There will be no parking of any vehicles on the public road near the wind farm site entrance. - Adequate parking will be provided on site for both employees and visitors. - The condition of the site entrances will be monitored on an on-going basis and a road sweeper provided to clean the public road if required. A Construction-phase Traffic Management Plan has been prepared for the proposed development and will be implemented during construction to address any traffic issues (Volume III Appendix 16A).	
DURING CONSTRUCTION	Chapter 05 Population and Human Health	Noise	Prior to the commencement of construction an active community engagement exercise shall be undertaken by the community liaison officer. Letter drops shall take place in advance of the works. The nature of the information letters provided details of the Project, specifically: - Contractor name and contact details. - Project description. - Expected duration of works. - A commitment to implement procedures and measures to minimise noise and vibration. The noise assessment includes measures to reduce the amount of noise reaching the noise sensitive receptors in accordance with <i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise</i>. Best practice will be employed at all times to minimise noise emissions from the construction site. These include: - The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. - All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.	Appointed Project Contractor

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			- Compressors will be attenuated models, fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. - Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. - A site hoarding will be erected at the boundary of the Borrow Pits and can be applied at any construction site/activity where necessary. A suitably constructed site hoarding can achieved a noise reduction of 3 dB to 10dB depending on the circumstances. - Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen. - During the construction programme, supervision of the works will include ensuring compliance with the limits using methods outlined in <i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise</i> by limiting the noise emission levels, reducing the operational time or a combination of both. - Erect site hoarding and temporary screens around noisy equipment. - Acoustic enclosures or portable screens will be utilised for plant and equipment operating in close proximity to residential dwellings. The following mitigation measures will be employed to control the impact during blasts associated with the turbine foundation works: - The site representative will liaise with the likely affected NSL(s). - Trial blasts will be undertaken to obtain scaled distance analysis. - Ensuring appropriate burden to avoid over or under confinement of the charge. - Accurate setting out and drilling. - Appropriate charging. - Appropriate stemming with appropriate material such as sized gravel or stone chipping. - Delay detonation to ensure small maximum instantaneous charges.	

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			• Decked charges and in-hole delays. • Suitable vibration monitoring will be conducted to enable adjustment of subsequent charges and that the vibration criteria are satisfied. • Good blast design to maximise efficiency and reduce vibration. • Avoid using exposed detonating cord on the surface. In the event of a noise exceedance or complaint, the source of the noise exceedance will be established and mitigation measures put in place.	
DURING CONSTRUCTION	Chapter 05 Population and Human Health	Dust	It is generally accepted that the proposed development will make a positive contribution to air quality once operational. Notwithstanding this, there is the potential for short-term negative impacts in terms of dust emissions during the construction phase of the development. Dust generated during the construction phase is not likely to significantly affect the local air quality. Dust levels are not expected to exceed the recommended TA Luft 350mg/m³/day guideline limit. There is, however, the possibility of dust occurring in the vicinity of the site entrance and along the local public roads which could affect road user health and visibility. In order to ensure that no dust disturbance occurs, a series of measures will be implemented: • Site access tracks will be regularly cleaned and maintained as appropriate. • Hard surface roads will be swept to remove mud and aggregate materials from their surface. • Furthermore, any road/track that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions. • Speeds will be restricted on hard surfaced roads/tracks as site management dictates. • Public roads in the vicinity of the site will be regularly inspected for cleanliness and cleaned as necessary. • A temporary vehicle wheel wash facility will be installed in proximity to site entrance. The dust minimisation plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			and to maintain the goal of minimisation of dust through the use of best practice and procedures. With the effective implementation of standard dust management measures to control and reduce dust, no significant adverse impact, in terms of a community disturbance at nearby houses and other buildings near the site, is likely to occur.	
DURING CONSTRUCTION	Chapter 06 Biodiversity	Best Practice (Environmental Clerk of Works (ECoW)/Project Ecologist)	A suitably qualified Ecological Clerk of Works (ECoW) will be appointed to ensure the mitigation measures outlined in the Habitat and Species Management Plan (see Appendix 6I) and the Construction Environmental Management Plan (CEMP) (see Chapter 02, Appendix 2A) are implemented during the construction phase of the Development. The ECoW will have demonstrated professional experience in managing large-scale construction works affecting ecological receptors identified within the EIAR. The duties of the ECoW will be to monitor the efficacy of mitigation measures implemented by the contractors and to report on the application and success of these measures. In the event of pollution occurring or the potential to occur, the ECoW will have a 'Stop Works' authority to ensure measures to stop a pollution event are implemented immediately.	Developer Project Manager
DURING CONSTRUCTION	Chapter 06 Biodiversity	Habitats and Flora	Where works are occurring in close proximity to hedgerows, temporary and permanent access tracks will not be sited within 3 m from the edge of the hedgerow vegetation, unless existing access tracks in such locations are being utilised. Existing agricultural tracks will be used by machinery traffic associated with construction works. No other construction works or activities will be located within 5 m of hedgerow vegetation Hedgerow and woodland replanting in appropriate areas within the Planning Application Boundary will mitigate the combined loss of 2,822m hedgerow and treeline. The total length of new and translocated hedgerow planting will be c. 3,970m. <u><i>Avoid introduction of invasive plant species</i></u> To avoid invasive plant species being introduced to the Development during the construction phase, material that cannot be retrieved from onsite borrow pits will be sourced from local quarries. Surveying, as detailed in the habitat management plan will include monitoring the Development during the operational phase to check for the presence of invasive plant species.	Developer Principal Contractor

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			All footwear/waders and any equipment that will enter the hydrological environment will be treated to prevent foreign flora/fauna entering the water and after use to prevent spread to other catchments. The following guidance will be adhered to during the implementation of the ISAP: • The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010); and • IFI Biosecurity Protocol for Field Survey Work (IFI, 2010).	
DURING CONSTRUCTION	Chapter 06 Biodiversity and Chapter 09 Water	Protection of Water Quality during Construction	Contractors will be required to implement standard practice construction methods and mitigation measures for in-stream or near stream works. The following measures are to be read in conjunction with the CEMP, SWMP and Volume II Chapter 09 (Water) in the accompanying EIAR: • A site surface water management system will be constructed on the site to attenuate run-off, guard against soil erosion and safeguard downstream water quality. The drainage system will be implemented along all work areas including all internal site access tracks, storage areas, crane hardstand areas and temporary site construction compounds. • Prior to construction, interception drains will be installed upslope of the works area to intercept any existing overland flows (clean water) and convey it downslope to limit the extent of surface water coming into contact with the works. The clean water conveyed will be discharged via a level spreader downslope of the works over existing vegetation. • Swales will be installed when required. To effectively reduce velocity and promote sediment settlement, clean gravel check dams will be placed along swales in order to intercept and slow down the flow of water, allowing sediment and suspended solids to settle out before they have a chance to enter the existing drainage network. The spacing, and sizing of the check dams will be designed in such a way as to ensure their effectiveness without causing any unintended issues such as excessive pooling or flooding. • Small defined works areas will be fenced off at the location of the storm water outfalls (between the main construction site and the water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the watercourses. The necessary pipelaying works will be undertaken within this defined area.	Appointed Project Contractor

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			- Silt traps and fencing will be placed in working areas that have the potential to carry silt-laden material from the working area to aquatic environments. - Entry to the Morningstar River and its tributaries by vehicles will be avoided, while vehicle usage along the banks will be restricted as much as practicable. - An ECoW will be present onsite to oversee near-stream works to ensure there is no potential for surface water run-off to the receiving waterbodies. The ECoW will undertake regular monitoring of water quality upstream and downstream of the works area to detect any changes and take corrective actions if necessary - Information obtained through consultation with IFI will be fully implemented prior to any works to ensure compliance with the Fisheries Acts and Habitat Regulations. - Where possible, no near stream works will take place outside the period 01 July to 31 September in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. - Near stream works relating to the drain and minor watercourse crossings within the Development will be staged, in consultation with IFI, so that only a small number of these crossings are under construction at one time. - Watercourse crossings and drainage ditch crossings and diversions will be constructed during low-flow periods, adhering to any working period restrictions imposed. - All open water bodies adjacent to areas of proposed works, including settlement ponds, will be protected by fencing. A 20 m buffer will be retained for construction works. Site traffic will only be permitted within this buffer to facilitate near-stream works. - For works occurring within 50 m of a watercourse, weather forecasts will be monitored prior to and during works to avoid working in adverse weather conditions. No excavations are to take place during a yellow rain warning or higher issued by Met Éireann. - In the event of heavy rainfall, open excavations will be secured, and emergency drainage measures will be implemented to prevent water backup and pollution.	

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			- Deposition areas for spoil and material will be enclosed with silt fencing to prevent mobilisation of solids during adverse weather conditions and no drainage from these areas will be directed into the temporary drainage systems. A Sustainable Drainage System (SUDS) will be implemented to allow controls to be designed for the retention of large volumes of water that may arise from material deposition areas. - The amount of time that stripped ground and soil stockpiles are exposed will be minimised, and only the vegetation from the specific area that needs to be exposed will be removed at any work stage. - Re-seeding of all areas of bare ground using native plant seed from a local source or the placement of jute matting will take place as soon as practicable to prevent runoff. - Hessian, mulches or tackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. - Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards. - There will be no unauthorised discharge of water to ground during the Construction Phase. - No concrete washout will be permitted on site unless a designated impermeable concrete washout area is provided containing adequate signage. - The wash water will be allowed to settle and evaporate with the cured material being broken out and either used as backfill on-site or removed from the site as inert waste. - Refuelling of machinery will take place in bunded enclosures, at a minimum of 20 m away from watercourses to prevent runoff into nearby watercourses. All machinery must carry an onboard spill kit in the event of an oil/fuel spill during all phases. - A complete mechanical check of all hoses and fluid reservoirs of machinery will be carried out by a competent member of the construction team before the machinery arrives at the site. - During the construction phase wastewater on site will be managed by temporary welfare facilities (port-a-loos). The stored effluent will be collected on a regular basis from site by	

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			a permitted waste contractor and removed to a licenced waste facility for treatment and disposal.	
DURING CONSTRUCTION	Chapter 06 Biodiversity	Protection of Fauna	Bats During construction it has been identified that 12 trees categorised as PRF-I and one as PRF-M will be felled. Felling will be undertaken outside the activity season (May to September inclusive) or the hibernation season (October to March inclusive). Should this not be possible, felling will be conducted under license and will involve additional measures including. • Checking the PRF(s) of the tree to be felled and all PRFs within 30m for live bats no later than the morning of felling. • Tree to be removed will be 'soft felled', as outlined in the NRA (2005) guidelines. ○ Removing the tree in sections, starting with the top branches and then working down the trunk trying to avoid cutting through cavities. ○ Any sections with PRFs must be lowered with care and laid on the ground with potential entrances to roosts orientated upwards to allow bat to vacate the roost. ○ Sections must be left in situ for at least 24 hours in suitable weather conditions to allow any bats to disperse. The addition of bat boxes throughout the Site will compensate for the removal of the PRFs. The siting of the boxes will be confirmed by the EcoW upon appointment. The area where habitats are cleared to create the bat feature buffers will be rendered as unsuitable as early as possible and maintained as such throughout the lifetime of the Development. To achieve this, felled timber and branches will be removed, and stumps will be brushed to ground level. Any excess spoil from excavation works during construction will be broadcast to cover over any ground stumps, creating a more homogenous habitat, reseeded will be established to minimise structural complexity and insect density near turbines. The area will be prevented from scrubbing up through a mowing or grazing regime. While there are not expected to be any significant impacts from ALAN or increased human/machinery presence, some effects are expected. Therefore, taking a precautionary approach, lighting will take into account	Site Environmental Manager Appointed Ecological Clerk of Works

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			ILP 08/23 guidance to avoid ALAN impacts on bat species. This will include (but not limited to): • LED luminaires will be used where practicable due to their sharp cut-off, lower intensity, good colour retention and dimming capability. • Column heights to be considered to minimise light spill. • Accessories such as baffled, hoods or louvres will be used to reduce light spill and direct it only where needed; and Where works are to be undertaken at night, lighting will be directed away from roosts and foraging/commuting features to reduce the potential for indirect impacts. Where lighting will remain in place, measures will be maintained for the lifetime of the Development. The precautionary approach to increased human presence and machinery will include (but not limited to): • Operators of all mobile equipment will be instructed to avoid unnecessary revving of machinery. • Use of appropriate plant and equipment with low noise level generation where possible. • All construction plant to be used on site will have effective well-maintained silencers. • A speed restriction of 20 km/hr will be applied on-site. • Regular and effective maintenance of site machinery including a full maintenance schedule to ensure that all pieces of equipment are in good working order. • Training of site staff in the proper use and maintenance of tools and equipment. • Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment. • Machines that could be in intermittent use will be shut down between work periods or will be throttled down to a minimum. • Plant start-up will be sequential rather than all together. • Internal access tracks to be well maintained. • Plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise-sensitive locations. • Drop heights for materials such as gravels will be minimised. Badger <u>Avoidance of entrapment</u>	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The risk of mammals becoming trapped if falling into excavated holes and trenches will be minimised through the provision of egress points, e.g. placing escape planks or spoil runs. In addition, the length of time excavations will be exposed will be limited. Any fencing erected as a result of the Development, outside of fencing around excavations, will be wildlife friendly. <u>Habitat enhancement</u> Additional compensatory hedgerow and woodland areas to be planted within the Development site will provide added foraging habitat and suitable areas for sett excavation. If any sett occurring within 50 m of proposed works (150 m if blasting) during the construction phase is confirmed to be a breeding sett, no works, including felling required to implement bat feature buffers, will occur within 50 m (or 150 m) of the sett during the badger breeding period (1 December to 30 June inclusive). Active setts will be marked to ensure all personnel are aware of the presence of setts to ensure accidental disturbance is avoided. Construction works will be largely limited to daylight hours (07:00 to 19:00 Monday to Saturday) in accordance with the timings detailed in Chapter 2 Description of Development, which will allow nocturnal animals like badgers to forage through the night. However, where some construction works may take place outside of stipulated times, e.g. continuous concrete pouring for turbine foundations may extend into the night, lighting will be kept to a minimum. Otter - No works will be undertaken within 150m of otter holts with breeding females or clubs. - No wheeled or tracked vehicles will be used within 20m of active, non-breeding otter holts. - No light works will be undertaken within 15m of active, non-breeding holts. Disturbance to foraging/commuting otters will be avoided by: - Construction works being largely limited to daylight hours allowing nocturnal animals like otters to forage through the night. - Minimising the risk of mammals becoming trapped if falling into excavations and trenches through the provision of egress points, e.g. placing escape planks or spoil runs. In addition, the length of time that excavations will be exposed will be limited.	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Artificial lighting associated with construction activities, will be of a design that limits light spill beyond the working areas. The EcoW will be consulted to ensure that lighting at the temporary construction compounds and in active working areas does not cause disturbance/displacement. The below mitigation measures will be employed to reduce light spill where necessary: • The use of sensor/timer-triggered lighting. • LED luminaires will be used where practicable due to their sharp cut-off, lower intensity, good colour retention and dimming capability. • Column heights to be considered to minimise light spill. • Accessories such as baffled, hoods or louvres will be used to reduce light spill and direct it only where needed; and • Where night time works are required, the appointed contractor will liaise with the Project Ecologist and implement measures to mitigate the potential adverse effect of such works on otter. Pine marten No confirmed pine martin breeding/resting places were identified within the proposed felling areas. Should any pine marten be identified the following mitigation applies. • No works will be undertaken within 100m of an active breeding den • No works will be undertaken within 30m of an active, non-breeding den. Amphibians No evidence of breeding amphibians were recorded within the development. Should either the common frog or smooth newt be confirmed to breed within the proposed development, consultation with the NPWS will be undertaken and if deemed necessary a translocation licence application will be submitted. Standard practice construction methods and mitigation measures for the protection of downstream water quality will be implemented for the protection of amphibians from potential adverse water quality effects.	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
DURING CONSTRUCTION	Chapter 06 Biodiversity	Protection of Fisheries and Biodiversity Aquatic Life	Standard practice construction methods and mitigation measures for the protection of downstream water quality, including protection from HDD operations and frac-out, will be implemented for the protection of aquatic IEFs from potential adverse water quality effects. Bridge design The proposed bridge is single span, with foundations on each bank which will be as far from the river channel as possible. There will be no instream work, and construction design will ensure that working is from each bank, without the requirement for machinery to pass through the river. The bridge will be high enough not to be overtopped by flood events and will incorporate drainage that does not discharge directly into the river Watercourse and drain crossing Construction of culverts will be staged, in consultation with IFI, so that only a small number of these crossings are under construction at one time, mitigating for the risk of multiple crossings where works are underway cumulatively releasing sediment downstream into the Morningstar River in the event of an unexpected severe weather event. Biosecurity All machinery operating onsite to be kept clean. All machinery brought on site to be checked by the EcoW for invasive species and cleaned before entry. Construction materials brought on site to be free from invasive species or their propagules (seeds, viable plant fragments, etc.) Measures set out for the prevention of spread of invasive plant species will be implemented. IFI Biosecurity Protocol for Field Survey Work (IFI, 2010) will be followed for the protection of spread of white-clawed crayfish plague. Pesticides Pesticide preparation, use or application will be avoided in sensitive areas, or areas where loss to waters is possible. Application of pesticides close to watercourses will be avoided.	Appointed Project Contractor Appointed Ecological Clerk of Works
DURING CONSTRUCTION	Chapter 06 Biodiversity	Biodiversity Enhancement	Hedgerow and tree line enhancement and replanting The total length of new and translocated hedgerow planting will be c. 3,970 m, resulting in a net gain of c. 1,574.7 m. Where existing hedgerows require enhancement, supplementary hedgerow will be planted to create double hedgerows. Hedgerow planting will include the following native species alder <i>Alnus glutinosa</i>, blackthorn	Appointed Project Contractor Appointed Ecological Clerk of Works

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			<i>Prunus spinosa</i>, holly <i>Ilex aquifolium</i>, bramble <i>Rubus fruticosus</i>, hazel <i>Corylus avellana</i>, dog-rose <i>Rosa canina</i>, spindle <i>Euonymus europaeus</i> and hawthorn <i>Crataegus monogyna</i>. Establishment of pond and wetland meadow Ponds and wetland meadow habitat will be created for the purposes of providing breeding habitat for amphibians, including common frog and smooth newt. Multiple smaller ponds are generally preferable to a single large one, as they offer more variety and reduce the risk of fish introduction. However, very small ponds may need more maintenance over time (English Nature, 2001). The area around the mitigation ponds will be considered as potential newt habitat and will reflect this with the provision of refuges/hibernacula. Establishment of native broadleaved woodland Native broadleaved woodland will be established. Similar to hedgerows, plants will be of native origin or Irish provenance, preferably grown from locally sourced seeds. Planting native broadleaved species will enhance the site's biodiversity. Given the current widespread ash dieback in Ireland, it is advisable to avoid planting ash. Tree planting will include <i>Alnus glutinosa</i>, <i>Betula pubescens</i>, <i>Ilex aquifolium</i>, <i>Pinus sylvestris</i>, <i>Prunus padus</i>, <i>Prunus avium</i> and <i>Quercus robur</i>. This planting will have an understory and shrub planting of <i>Prunus spinosa</i>, <i>Rosa canina</i> and <i>Euonymus europaeus</i>. Establishment of native species-rich grassland Conifer plantation will be removed during the construction phase of the Development to accommodate the proposed Ballinlee substation, including an area of 10-20 m surrounding the substation. This area will become available for habitat enhancement measures which will take the form of a proposed species-rich grassland using locally sourced seed stock. Reseeding of grassland habitats will be implemented using hay transfer. This is an effective near-natural solution for grassland restoration (Orsolya, 2022) which avoids importing a seed mix and instead utilises the existing seed bank and seed resource. Adjacent, or nearby, grassland similar to the grassland that is being removed will be cut when grasses and flowering plants are in seed. These cuttings will be laid over the reinstated bare ground for natural colonisation.	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
DURING CONSTRUCTION	Chapter 07 Ornithology	Ornithology	Mitigation during construction will focus on disturbance reduction, early establishment of alternative foraging areas, and deterrence from high-risk turbine locations. These include: • Habitat Enhancement Completion: All enhancement works at Camas South (e.g. reseeded, fencing, field amalgamation, and water scrape creation) will be completed prior to the onset of construction to allow swans to become habituated to the improved habitat. • Deterrence Measures Near Turbines: If swan usage of fields within 200 m of turbines is recorded prior to construction, temporary deterrents (e.g. bird-scaring lines, acoustic deterrents, visual flags) will be deployed to dissuade feeding in areas at future collision risk. These will be monitored to prevent displacement to less secure or less visible areas. • Scrub Removal and Drainage Management: Scrub removal and minor drainage works will be undertaken prior to the first arrival of wintering swans (i.e., by early October), to maximise attractiveness of the enhanced field and minimise construction-phase overlap. • Vegetation Removal/Breeding Bird Safeguards: All vegetation removal or scrub clearance within potential nesting habitat will follow the Bird Breeding Season (BBS) restrictions. Where vegetation removal cannot be avoided during the breeding season, pre-clearance nest checks will be conducted by a qualified ecologist to ensure no active nests are destroyed. • Buffer Zones Around Foraging Swans: A minimum 300 m exclusion zone will be maintained around active swan foraging flocks, within which no high-noise or high-movement construction activity will be permitted during the winter season (October to March). • Timing Restrictions on Construction: No heavy construction works ((e.g. turbine foundation pouring, excavation, major crane operations) will occur on turbines T1 to T5 during the core wintering period (October to March) in accordance with the Whooper Swan Management Plan (WSMP, Appendix 7D). Light works (such as cable laying, minor civil works, or component delivery without lifting) may	Appointed Project Contractor Appointed Ecological Clerk of Works

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			proceed on T1, T2, T4, and T5, but no work will be conducted around T3 during this period. - Seasonal Exclusion Zones for Construction Disturbance: To minimise disturbance to wintering whooper swans, all construction works (including groundworks, plant operation, and vehicle movement) will be excluded from designated buffer zones around core swan foraging areas (e.g. Camas South) from 1 October to 31 March annually. - Buffer distances will be informed by previous swan usage data and typically extend at least 300 m from active foraging fields. - Where proximity to turbines or haul routes cannot be avoided, temporary screening and noise suppression measures (e.g. acoustic barriers, directional lighting) will be applied. - Work scheduling will prioritise quiet periods (e.g. mid-day) and avoid early morning and late evening periods when swan activity peaks. These measures will be reviewed annually and updated through adaptive management based on monitoring results and swan sensitivity at each location.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Land use	The footprint of the works has been minimised to avoid unnecessary soil sealing, disruption, etc. A minimal volume of soil and subsoil will be removed to allow for infrastructural work to take place in comparison to the total volume present on the site due to optimisation of the layout by mitigation by design. Turbine locations, the alignment and rotation of the hardstands, and the routes of proposed new access tracks were designed to optimise the balance between access criteria and the required volumes of excavated and imported materials. The turbine foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation, and landscaped using the vegetated soil set aside during the excavation. The land associated with the footprint of the development will be reinstated at the end of the operational life of the proposed development such that it can be used again for pastoral purposes. The land outside the	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			proposed development will not be affected by the development, and current land use practices will remain in place on these lands over the lifetime of the development. The area of land required to construct, operate, maintain and ultimately decommission the proposed development has been kept to the minimum reasonably practicable area as part of the design process. Existing access tracks have been utilised in the design as much as possible such that the existing land use does not change in these areas of the site during the operational life of the proposed development. This approach minimised the area temporarily altered from its current land use. These measures are designed to reduce the effect of land use change by sequestering carbon, reducing waste (soil, subsoil, and rock materials), target limitations and controls on soil sealing, and not changing the use of the original lands where practicable. The proposed grid route is located within the existing road network as much as possible, thereby minimising the impact on current land use.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Soil Erosion	Excavations for the borrow pits and turbine hardstands will be the largest scale excavations onsite. These excavations will be completed to an approved temporary works design and carried out such that they are stable or adequately supported. This will involve creating safe side slope angles, installation of drainage around and within the excavation, and installation of sediment control measures within the drainage system to prevent soil erosion. Drainage will be constructed in parallel with access track construction and turbine excavation, including drains and settling ponds, etc. A combination of new and upgraded drainage networks will be installed within the site. The existing drainage network will be utilised where possible and will be upgraded where necessary including the installation of settlement ponds and sediment traps at key locations. The drainage network has a twin system of water management separating out clean water from dirty water. This network and design approach is outlined in Chapter 02 Description of the Proposed Development of this EIAR. Temporary works will be such that they do not adversely interfere with existing drainage channels/regimes.	Appointed Project Contractor Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Temporary stockpiles of excavated spoil, stored in the footprint of the excavation areas, will be directed for use in backfilling and restoration or placed in the deposition areas on site. Reusable excavated sub-soils and aggregate will be stored in temporary stockpiles at suitably sheltered areas to prevent erosion or weathering and shall be shaped to ensure rainfall does not degrade the stored material. Stockpiles will be stored away from any open surface water drains, managing height and slope of all stockpiles and minimising soil movement. Excess spoil material will be stored on site in the nine (9) designated permanent deposition areas and two (2) temporary deposition areas. The proposed deposition areas will be subdivided into a series of cells. Each cell will be bunded by an embankment of engineered fill material capable of allowing a tracked excavator to move between the cells during deposition activities. The size of each cell will be dictated by the maximum working length of the excavators working the deposition area. Each cell will be bunded on all downslope sides. The bund will be of adequate strength to retain the spoil stored within each cell. Upon completion of each cell the surface of the deposited spoil will be profiled to a gradient not exceeding 5 %. Whenever possible, existing access tracks have been utilised to access turbine locations. This reduces the volume of excavated material and imported crushed rock for track construction. Excavations and material removal that will take place during the construction phase will be localised to the turbine locations and access tracks. Excavated material from the grid route will be used to reinstate the area around the cable trench following backfilling of the trench with approved materials or deposited within the proposed on-site borrow pits as part of their reinstatement. In the event that there is a requirement for soil to be exported from site, this will be treated as an Article 27 by-product (a non-waste) where practicable or treated to comply with Article 28, and recycled if possible. A Resource Waste Management Plan (RWMP) will be implemented by the appointed contractor, and included as EIAR Volume III, Appendix 2B. The mitigation measures for the grid connection will be the same as those at the wind farm site. These include mitigation measures for soils and geology, drainage, siltation control, hydrocarbon release and general site management and will be fully in line with any requirements identified in the Environmental Management Plans found in the CEMP (EIAR Volume III, Appendix 2A). The land use at these locations will not change.	

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			The subsoil and bedrock which will be excavated during the construction phase will be localised to the proposed grid connection route alignment. A minimal volume of subsoil and bedrock will be removed to allow for grid connection works, and suitable material will be reused in trench backfilling where possible. Excess excavated material will be removed to the deposition areas. Once in place, the grid connection will not affect existing or further land uses.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Soil Compaction	Due to the significant loads that will be imposed by the outriggers of the main lifting crane during the erection process for the installation of the wind turbines on site; it is intended that the proposed crane hardstands will be constructed using excavation methods over the footprint of the hardstand area / turbine base. The CEMP (EIAR Volume III, Appendix 2A) includes minimum site management controls to reduce and mitigate for compaction. A TMP (EIAR Volume III, Appendix 16A) has been developed to manage and control vehicular movement onsite. Measures will include the scheduling of HGVs during the construction phase to reduce the number of vehicle movements in, through and off site. This in turn will reduce the impact of soil compaction and erosion. Unscheduled vehicles will not have access to the site. Machinery will not operate directly on excavated/stockpiled soils. Heavy vehicles will only follow designated and newly constructed access tracks and avoid loading areas which are not contained within the footprint of the main works to minimise disturbance of the original soil and subsoil formations and to retain soil structure. The compound, vehicles, stockpiled materials and heavy machinery will be in place for the duration of the construction phase and will be removed once commissioning is complete. Within and around excavations, pore water pressure will be kept low by avoiding loading the soil/subsoil and giving careful attention to the existing drainage, as compaction would alter the surface drainage regime (see Chapter 09 Water).	Appointed Project Contractor and/or Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
DURING CONSTRUCTION	Chapter 08 Land and Soils	Slope Stability	The existing network of drainage within the site will be utilised whenever possible. An emergency response system will be developed for the construction phase of the project, particularly during the early excavation phase. This, as a minimum, will involve 24 hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 100 year storm event or very heavy rainfall at >25mm/hr), planned responses will be undertaken. These responses will include cessation of construction until the storm event including storm runoff has passed over. A competent project geotechnical engineer or engineering geologist will be employed during the construction phase of the works. As part of the detailed design and assessment, identification of potential planes of weakness will be made in the overburden such as discrepancies in the material type and foliation direction in the bedrock. Earthworks will be constructed to safe stable angles in accordance with the detailed design and best practice. Plant and materials will be stored in approved locations only (proposed temporary site compound) and will not be positioned or trafficked in a manner that would surcharge existing or newly-formed slopes.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 08 Land and Soils	Accidental Spills and Contamination/Pollution	The CEMP (EIAR Volume III, Appendix 2A) includes site management controls and wheel wash facilities to mitigate for contamination/pollution. The permanent access track works will require a drainage network to be in place for the construction works and operational phases of the wind farm. Wheel wash facilities will be available onsite for the duration of the construction phase. The proposed surface water drainage is summarised in Chapter 04 Civil Engineering, Chapter 09 Water and Chapter 17 Material Assets-Built Services. A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc. Good site practice will be applied to ensure no fuels, oils or any other substance are stored in a manner on site in which they may spill and enter the ground, particularly when the initial top layer of made ground is excavated. Dedicated, bunded storage areas will be used for all fuels or hazardous substances. Spill kits will be maintained on site.	Appointed Project Contractor

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			The potential for hydrocarbons getting into the existing drains, local watercourses, and the land and soils environment will be mitigated by only refuelling construction machinery and vehicles in designated refuelling areas using a prescribed re-fuelling procedure. A fuel management plan will be implemented incorporating the following elements: • Refuelling of Construction Plant On-Site – Refuelling will be carried out using 110% capacity double bunded mobile bowsters. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using. Plant nappies or absorbent mats will be placed under refuelling points during all refuelling to absorb drips. Mobile bowsters, tanks and drums will be stored in secure, impermeable storage areas, over 50m away from drains and open water. To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor. Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits, all oil, and any contaminated material will be removed and properly disposed of in a licensed facility. Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery. Correct action in the event of a leak or spill will be facilitated by training all vehicles/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction. In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery. • Materials Handling, Fuels and Oil Storage – Leakages of fuel/oil from stores will be prevented by storing these materials in bunded tanks which have a capacity of 110% of the total volume of the stored oil. Ancillary equipment such as hoses and pipes will be contained within the bunded storage	

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			container. Taps, nozzles or valves will be fitted with a lock system. • Concrete – On-site washing of concrete truck barrels will not be allowed. A designated chute wash down area, which will retain the washout water, will be located within the construction compound and there will be no other chute wash down activity on any other part of the site. The drainage and treatment system will be managed and monitored, particularly after extreme rainfall events during the construction phase. Controls will be regularly inspected and maintained. A programme of inspection and maintenance will be designed and dedicated construction personnel such as an ECoW assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed and records kept of inspections and maintenance works. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations. Stockpiles of stripped topsoil will be in locations with minimum trafficking to prevent damage and dusting. The access track surface can become contaminated with clay or other silty material during construction. Access track cleaning will, therefore, be undertaken regularly during wet weather to reduce the volume of sediment runoff to the treatment system. This is normally achieved by scraping the track surface with the front bucket of an excavator and disposing of the material at designated locations within the site.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Rock Blasting	As part of the constraints led design process, the proposed turbine foundations have been located in areas away from steep slopes, a large change in the topography, and of thin soil cover as per Chapter 04 Civil Engineering of this EIAR. Turbines and infrastructure in these areas are deemed to have low susceptibility to landslides. To mitigate against the risk of slope failure occurring, blasting will not be permitted at any locations unless robust mitigation measures are put in place. These include: • Blasting will not occur after periods of heavy rainfall to mitigate against any ground stability. In particular, no blasting will take	Site Environmental Manager

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			place for at least 24 hours following a period of rainfall which exceeds 25mm within the previous 24 hours. • Rock blasting will only take place if extraction using rippers or hydraulic breakers is deemed impractical. Circumstances include where the rock strength is such that other means of extraction are not possible and production rates need to be increased to keep up with the construction programme. • If rock blasting proves to be necessary, a detailed blasting design will be undertaken by a suitably qualified and experienced specialist for each location to ensure that a peak particle velocity (PPV) of 10 mm/s is not exceeded at a distance of greater than 20m from the blast holes as per BS 7385 Part 2: 1993. If this cannot be achieved, blasting will not be permitted at this location. • A Blast Management Plan will ensure compliance with the Explosive Act 2006 (amended by Part 6 of the Criminal Justice Act 2006) and related legislation, and BS 7385 in relation to blasting. • Limerick City and County Council, An Garda Síochána, and adjoining landowners will be notified in advance of any blasting activities on the site. The Blast Management Plan will be prepared by the appointed contractor prior to the construction phase.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Tree Felling	Topsoil removed from felled areas for the construction of the proposed development will be used in landscaping works or placed in the deposition areas. Where possible, the vegetative layer will be stored with the vegetation and soil facing the right way up to encourage regrowth. The felling areas will then be monitored and maintained following construction and into the operational phase of the development. Any runoff from the clear-felled areas will be treated using the same design philosophy as that for the access tracks and hardstands. This includes the separation of clean and dirty water by the installation of berms, channelling dirty water to silt traps and settlement ponds and ensuring that the discharge rate of the drainage system is no higher than the existing condition by using engineered settlement ponds.	Appointed Project Contractor

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			Where practicable, brash mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along off-track routes where practicable, to protect the soil from compaction and rutting. All works will be completed to standard forestry guidelines (Department of Agriculture, Food and the Marine [Teagasc], 2019, Standards for Felling and Reforestation), and in accordance with licence conditions issued by the Forest Service.	
DURING CONSTRUCTION	Chapter 08 Land and Soils	Grid Connection Route and Substation	The mitigation measures for the grid connection route and substation will be the same as those at the wind farm site as discussed in previous sections. These include mitigation measures for soils and geology, drainage, siltation control, hydrocarbon release and general site management and will be fully in line with any requirements identified in the Environmental Management Plans found in the CEMP (EIAR Volume III, Appendix 2A).	Appointed Contractor
DURING CONSTRUCTION	Chapter 09 Water	CEMP and Environmental Management	During the construction phase, all works will be undertaken in accordance with the CEMP (MWP, 2025), SWMP (MWP, 2025) and the RWMP (MWP, 2025). Following appointment, the contractor will be required to further develop the CEMP, SWMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532³, CIRIA, 2001³). The CEMP, SWMP and RWMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development. These measures will address the main activities of potential impact which include: Control and management of surface water runoff.	Appointed Contractor

³ Guidance for Consultants and Contractors, CIRIA-C532, CIRIA, 2001 - <https://www.ciria.org/CIRIA/ProductExcerpts/C532.aspx>

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			- Control and management of shallow groundwater during excavation and dewatering. - Management and control of soil and materials. - Appropriate fuel and chemical handling, transport and storage. - Management of accidental release of contaminants at the site. - Control and handling of cementitious materials. The appointed contractor will produce a Pollution Prevention Plan (or similar document). This will include procedures and diagrams for: - Dewatering of excavations. - Temporary soil storage. - Fuel storage/refuelling. - Concrete wash-out area. - Controlling surface water entering site. - Preventing existing drainage features becoming pathways for construction run-off. - Reducing soil exposure and reinstating as rapidly as possible. - Contingency measures.	
DURING CONSTRUCTION	Chapter 09 Water	Drainage Management	Management of Surface water runoff will be required to prevent runoff entering excavations during construction. Surface water will require diversion around the open excavations using standard temporary drainage methods to ensure that surface water is effectively conveyed around works areas. All open water bodies adjacent to areas of proposed works, including settlement ponds, will be protected by fencing. A 20m buffer will be retained for construction works. Site traffic will only be permitted within this buffer to facilitate in-stream and near-stream works. All near-stream works carried out adjacent to watercourses will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).	Appointed Project Contractor

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			Where practical, cut-off V drains will be utilised to divert water entering the site and reduce the amount of water to be managed on-site. Attention will be given to the maintenance and protection of all drains and temporary channels to minimise scour and the mobilisation of suspended solids (e.g. lining with hessian or clean stone, check dams, silt fencing etc.) Blasting if required will be carried out by a suitably qualified specialist under licence with a suite of standard best practice mitigation measures in place. Surface water management measures will be place as described above to ensure that surface water runoff cannot enter the area subject to blasting. Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750). The dewatering methodology implemented by the appointed contractor will ensure that any dewatering is confined to the localised zone and does not extend towards the site boundaries. Where dewatering is required, this will be treated as part of the surface water drainage network and allowed to infiltrate to ground ensuring that the existing hydrogeological regime is maintained and groundwater levels remain stable. There will be no unauthorised discharge of water to ground during the Construction Phase. Drainage channels will be clearly identified on site and shown on method statements and site plans. Where required, standard design and construction measures (i.e., groundwater drainage around impermeable subsurface structures) will ensure that groundwater flow across the site is maintained and that there will be no impact on groundwater levels. The proposed piling methodology (if piling is required), will give cognisance to the Environment Agency's (EA) guidance on 'Piling into Contaminated Sites' (EA, 2002) and 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (EA, 2001), (or similar best practice) in order to minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater. The piling method will also include procedures to ensure any potential impact to water quality is prevented	

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			including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions. The horizontal directional drilling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other drilling fluids from entering the entry and exit pits and surrounding formation. For directional drilling, the area around the bentonite batching, pumping, and recycling plant will be banded using Terram Geotextiles to accumulate sediment against its surface, along with sandbags to contain any spillages. Drilling fluid returns will be contained within a sealed tank or sump to prevent migration from the works area. Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized skip before being taken off-site. The drilling fluid/bentonite will be non-toxic and naturally biodegradable, such as Clear Bore Drilling Fluid or a similar product. The drilling process and pressure will be constantly monitored to avoid leaks or breakouts into the surrounding geology or local watercourse. This will be gauged by observation and monitoring of pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped. Any fluids, lubricants and waste materials that result from the drilling will be contained and removed off-site.	
DURING CONSTRUCTION	Chapter 09 Water	Sediment Control	Entry to the Morningstar River and its tributaries by vehicles will be avoided. Vehicle usage along the river banks will be restricted as much as practicable. Any machines working in proximity of the watercourse will be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels. No in-stream works will take place in EPA mapped watercourses. Where possible, near-stream works will take place outside the period July 1st to September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. To prevent elevated levels of erosion and sedimentation at the site during the construction phase, surface water at the site will be managed and controlled via the newly constructed site surface water management system to attenuate run-off, guard against soil erosion and safeguard	Appointed Project Contractor

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			downstream water quality. Silt traps, silt fences and settlement ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase. As a minimum, silt fencing will be provided at all water crossings, and the settlement ponds will be designed to ensure they are not overwhelmed by one-off adverse precipitation events. The silt fencing and settlement ponds will be monitored daily by the appointed contractor to remove silt as required and to ensure that they remain functional throughout construction of the Proposed Development. Where necessary, maintenance will be carried out on the fences and settlement ponds to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the appointed contractor or ECoW. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of watercourses and during and after storm events. It is noted that the frequency of monitoring will depend on the stage of works, and local environmental conditions. The frequency of checks will be increased during critical works including the initial decommissioning works, during concrete pours and after storm events.	
DURING CONSTRUCTION	Chapter 09 Water	Monitoring	A suitably qualified Environmental Clerk of Works (ECoW) will be appointed for the duration of the construction works. Surface water monitoring to include Turbidity, pH/EC and colour will be undertaken daily upstream and downstream of the works areas and where required, at the outlets from settlement ponds. Where water from the settlement ponds fails to meet the required standards, additional modules will be added to the settlement pond until the required standards are met. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 09 Water	River Crossing	Works during the construction of closed conduit culverts and permanent surface water drainage features will include the following measures: An ECoW will be present onsite to oversee the works to ensure there is no potential for surface water run-off to the receiving waterbodies. The ECoW will undertake regular monitoring of water quality upstream and downstream of the works area to detect any changes and take corrective actions if necessary.	Appointed Project Contractor

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			- Prior to the commencement of the construction works, small defined works areas will be fenced off at the location of the culverts / surface water drainage system outfalls (between the main construction site and the water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed works and the existing surface water drains and tributaries of the Morningstar River. The necessary works (culvert/pipe/headwall) will be undertaken within this defined area. - Heras fencing will be installed in front of the silt fencing to prevent "Site creep", the progressive movement of site activities towards this silt fence. - Precast headwall and precast concrete culverts/HDPE pipes are proposed throughout the development, where this is not possible in-situ concrete will be used. - Existing vegetation will be preserved where possible and disturbed areas replanted promptly to stabilize soil and reduce erosion. - Once excavations for the culvert/pipe/headwall are complete, the base and sides of the excavations will be seeded with a native wetland wild flora seed mix which will be allowed to establish for a 6-8 week period prior to the culvert/pipe/headwall becoming operational and receiving surface waters from the site. This will provide "green" erosion prevention of the outfall channel and prevent siltation of the receiving waterbodies. - Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the existing surface water drains and minor watercourses on site will be removed to facilitate the construction of the outfall for the IPP & SS compounds. Only workers and machinery essential to the construction of surface water drainage network, crossing and headwalls will be allowed within the 20m watercourse buffer area. It will be ensured that all river protection measures will be maintained in good and effective condition for the duration of the proposed works and checked regularly to ensure that the silt fencing and other standard mitigation measures are operating effectively.	

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DURING CONSTRUCTION	Chapter 09 Water	Storage Areas	Where required, stockpiles will be kept to a minimum and will be protected within designated areas for the duration of the works and not located in areas where sediment laden runoff may enter existing waterbodies. To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff. Where required, silt fences will be erected at the toe of stockpiles to prevent runoff. The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 09 Water	Plant and refueling	During the construction phase, fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities offsite). Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas such as the temporary compounds. These areas will be bunded and located away from surface water drainage and features. Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing. The main contractor will ensure that strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site. There may also be the requirement for the use of portable generators or similar fuel containing equipment during the Construction Phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.	Appointed Project Contractor

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			Emergency procedures will be developed by the main contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with best practice standards and legislative requirements including but not limited to the Environmental Protection Agency Act, 1992 (as amended), Waste Management Act, 1996 (as amended) and the Safety, Health and Welfare at Work Act, 2005 (as amended). - Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site. - Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants. - Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained. - In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards. - All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages. - All construction works staff on-site will be fully trained on the use of equipment. The main contractor will prepare method statements for weather and flood forecasting and continuous monitoring of water levels in the Morningstar River and its Tributaries. These will be made available to the local authority where requested. The main contractor will also provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones in order to minimise the risk to persons working on the site as well as potential input of sediment or construction materials into the waterbodies during flood events.	

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			Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the Construction Phase of the Proposed Development will be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility. Therefore, there will be no potential impact on water quality and the WFD status of receiving waterbodies and any Natura 2000 sites associated with discharges from the site.	
DURING CONSTRUCTION	Chapter 09 Water	Concrete Control	During the construction phase, cementitious grout will be used to prevent contamination of the hydrogeological environment. Concrete pouring will be carried out during dry weather and effectively isolated from onsite drainage channels and waterbodies and will be monitored to prevent accidental discharge. The appointed contractor will follow appropriate design and methods, adhering to the CEMP (EIAR Volume III, Appendix 2A) and industry standards to protect groundwater and surface water quality. Ready-mixed concrete will be delivered by truck, with batching done offsite. Concrete truck chute wash down will occur in a controlled bunded area, with waste removed offsite in compliance with waste management legislation. The containers will be checked and emptied at a frequency equivalent to the volume of concrete being used to prevent runoff leaving the washout location. A risk assessment for wet concreting will be completed before works begin, and monitoring will ensure no accidental discharge.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 10 Air Quality	Dust Generation	Construction phase generated dust will be minimised by the following measures that will be implemented in full, and which are also incorporated into the site-specific CEMP (Volume III, Appendix 2A): - Water will be used as a dust suppressant where required e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise; - Public roads will be inspected regularly for cleanliness and cleaned as necessary; - All loads entering and leaving the site will be covered during dry periods, to protect from dust;	Appointed Project Contractor

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			- Vehicle speeds will be controlled when passing over access tracks and crane hardstanding areas within the site; - Wheel wash facilities will be implemented at the site entrance from the public road to facilitate removal of any material collected by vehicles entering or leaving the site and preventing its deposition on public roads; and - Site stockpiling of materials will be designed in accordance with a Stockpiling Management Plan which will be implemented at the construction stage by appointed contractor and laid out to minimise exposure to wind.	
DURING CONSTRUCTION	Chapter 10 Air Quality	Construction Traffic Emissions	Construction traffic emissions will be reduced using the following measures that will be implemented in full: - Ensure regular maintenance of plant and equipment. Carry out periodic technical inspection of vehicles to ensure they perform most efficiently; - Implementation of the Traffic Management Plan (Volume III, Appendix 16A) to minimise congestion; - All site vehicles and machinery will be switched off when not in use, and no idling of engines will be permitted; - The majority of aggregate materials for the construction of the proposed development will be obtained from the on-site borrow pits. This will reduce the number of delivery vehicles to site, thereby reducing emissions associated with vehicle movements.	Appointed Project Contractor Site Environmental Manger
DURING CONSTRUCTION	Chapter 11 Climate	Climate	Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Measures to reduce the embodied carbon of the construction works will be implemented as follows: - A construction programme will be created to allow for sufficient time to determine reuse and recycling opportunities; - Alignment with requirements under the Local and National Climate Action Plan; - The replacement, where feasible, of concrete containing Portland cement with a low carbon concrete as per the Climate Action Plan; - The IEMA mitigation hierarchy will be followed;	Appointed Project Contractor Site Environmental Manger

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			• A suitably competent contractor will be appointed who will undertake waste audits detailing resource recovery best practice and identify materials that can be reused/recycled; • Materials will be reused on site within the new build areas where possible; • Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods; • All plant and machinery will be well maintained and inspected regularly; • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site; and • Sourcing materials locally where possible to reduce transport related CO₂ emissions. Measures have been incorporated into the design of the proposed project to mitigate against the impacts of future climate change. These measures have been considered when assessing the vulnerability of the proposed project to climate change but will be reviewed on a regular basis (every 5 years) to ensure they continue to be appropriate to mitigate the effects of climate change. The environmental commitments of the project will be managed through the CEMP and will be secured in contract documentation and arrangements for construction and later development stages. The CEMP will mainly address the construction phase. However, where mitigation and monitoring are to continue into the operational and decommissioning, phases, these commitments will be communicated and transcribed into operational process documentation. The CEMP is included in EIAR Volume III, Appendix 2A. During construction, the Appointed Contractor will be required to mitigate against the effects of climate change on the proposed development: • mitigate against the effects of climate change such as extreme rainfall / flooding through site risk assessments and method statements; • The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements; • All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating	

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			temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction; and During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.	
DURING CONSTRUCTION	Chapter 13 Noise and Vibration	Noise	The following list of measures will be implemented to ensure compliance with the relevant construction noise criteria: - The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. - All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. - Compressors will be attenuated models, fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. - Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. - A site hoarding will be erected at the boundary of the Borrow Pits and can be applied at any construction site/activity where necessary. A suitably constructed site hoarding can achieve a noise reduction of 3 dB to 10dB depending on the circumstances. - Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen. - During the construction programme, supervision of the works will include ensuring compliance with limits using methods outlined in <i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise</i> by limiting the noise emission levels, reducing the operational time or a combination of both. - The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall be restricted to between 07:00hrs and 19:00hrs Monday	Appointed Project Contractor Site Environmental Manager

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			to Saturday on the main site and on the grid works: 07:00hrs and 19:00hrs on weekdays and between 07:00hrs and 14:00hrs on Saturdays. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with the local Planning Authority.	
DURING CONSTRUCTION	Chapter 13 Noise and Vibration	Borrow Pits	During the works, suitable vibration monitoring will be conducted at the closest NSLs to Borrow Pit 1 and Borrow Pit 2 (NSL359 and NSL157 respectively) to ensure that the vibration criteria set out is satisfied. The following mitigation measures will be employed to control the impact during the works at the 2no. Borrow Pits: • The site representative will liaise with the likely affected home owners. • Suitable vibration monitoring will be conducted at the closest NSLs to ensure that the vibration criteria are satisfied. • The condition of the properties will also be regularly inspected to ensure no cosmetic or structural damage occurs.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 13 Noise and Vibration	Blasting Events	The following mitigation measures will be employed to control the impact during blasts associated at the turbine foundation works: • The site representative will liaise with the likely affected home owners. • Trial blasts will be undertaken to obtain scaled distance analysis. • Ensuring appropriate burden to avoid over or under confinement of the charge. • Accurate setting out and drilling. • Appropriate charging. • Appropriate stemming with appropriate material such as sized gravel or stone chipping. • Delay detonation to ensure small maximum instantaneous charges. • Decked charges and in-hole delays.	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			- Suitable vibration monitoring will be conducted to enable adjustment of subsequent charges and that the vibration criteria set out are satisfied. - Good blast design to maximise efficiency and reduce vibration. - Avoid using exposed detonating cord on the surface.	
DURING CONSTRUCTION	Chapter 14 Cultural Heritage	Cultural Heritage	- Targeted geophysical surveying and follow-on licensed testing, and monitoring of archaeological sensitive areas will be undertaken of elements of the proposed core wind farm. - Licensed archaeological monitoring will be undertaken during the construction/excavation of the external grid connection route within the Zones of Notification of recorded archaeological sites, particularly in the Lough Gur area. - If during the proposed archaeological testing and monitoring, previously unrecorded sites/features are discovered, then preservation 'in situ' or preservation by record will be proposed. - Turbine Delivery Route Archaeological monitoring will be undertaken in the location of pinch point 15 of the TDR where the proposed route will expand within a greenfield section at Tullovin.	Appointed Project Contractor
DURING CONSTRUCTION	Chapter 16 Material Assets – Traffic and Transportation	Traffic and Transportation	All traffic management and road signage will be in accordance with the Department of Transport (DoT) Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Signs for Road Works; and in agreement with Limerick City and County Council. A pre-construction bridge and road survey will be carried out on the haul routes on the R516, which will be monitored on a regular basis and any damage rectified promptly. Once construction has been completed a post construction road and bridge survey will be carried out. Any sections identified as damaged after the preconstruction survey will be reinstated. A Traffic Management Plan outlining the required traffic management procedures to be implemented on the public roads during the construction of the proposed development is provided in Volume III, Appendix 16A of this EIAR. The Traffic Management Plan will be updated, as appropriate, following the proposed project detailed design/tendering	Appointed Project Contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			stage, and submitted for the approval of Limerick City and County Council, prior to construction. The proposed grid connection will require a Road Opening License (ROL) prior to the commencement of any grid connection works on the public road. The road surface of the public roads will be reinstated to the standards set out by the Department of Transport (DoT) Guidelines on the Opening, Backfilling and Reinstatement of Trenches on Public Roads (April 2017). All road permanent reinstatement works will be in accordance with the requirements of Limerick City and County Council. Construction wheel wash facilities will be provided at the construction compounds to wash truck tyres leaving the construction site.	
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Forestry and Hedgerow	The effect of the wind farm on forest operations and the potential effect of forestry felling on the environment will be controlled as it currently is, by strict environmental controls, practices and guidelines as described by the relevant Forest Service Guidelines. Any tree felling required to facilitate the construction, operation, or decommissioning of the wind farm will be kept to a minimum and under the terms of felling licences. Obligations to replant clear-fell areas will be fulfilled. The site layout was designed to utilise existing tracks, and the infrastructural footprint largely targets lower value habitats, including improved grassland. Likewise, areas where felling is required to implement bat feature buffers have targeted commercial forestry and the lengths of treelines and hedgerows that will be removed will be kept to a minimum. Furthermore, the number of locations where access tracks are required to punch through hedgerows/treelines has been limited and the areas to be removed will be kept to a minimum. Where works are occurring in close proximity to hedgerows, temporary and permanent access tracks will not be sited within 3 m from the edge of the hedgerow vegetation, unless existing access tracks in such locations are being utilised. Existing agricultural tracks will be used by machinery traffic associated with construction works. No other construction works or activities will be located within 5 m of hedgerow vegetation.	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The proposed development will not result in any significant adverse effects on forest resources requiring additional mitigation.	
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Grid Capacity and Electrical Infrastructure	Mitigation by design has been adopted whereby the grid connection methodology at the proposed development will minimise effect on existing built infrastructure. All electrical and other services within the public road will be identified prior to construction of the 110kV underground grid route cable. The contractor will put the following measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with ESB Networks: • Carry out a full survey of all underground and overhead electrical and utility services along the 110kV grid connection route prior to construction. • Identify exact locations of live overhead lines, underground cables, and other utilities. • Ongoing consultation with ESB Networks to ensure safe working practices and compliance with their guidelines. • Agree in advance any temporary disconnections or diversions of electrical services. • Notify ESB Networks before any works near live infrastructure. • Implement exclusion zones and physical barriers when working near live overhead or underground lines. • Ensure all staff and contractors are trained in working safely near live electrical infrastructure. • Use protective equipment and follow ESB-approved procedures for working adjacent to live services. • Where diversion or temporary relocation is necessary, carry out works in a controlled and planned sequence to prevent interruptions. • Confirm the location of all Gas Networks Ireland high- and medium-pressure pipelines through trial holes prior to construction. • Maintain safe distances from all pipelines; no turbines or infrastructure will encroach on pipeline wayleaves. • Follow GNI codes of practice for working near pipelines. • Provide staff training on emergency procedures in case of accidental pipeline contact.	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			• Maintain emergency contacts for ESB Networks and Gas Networks Ireland on site. • Implement immediate shutdown and evacuation procedures if accidental damage occurs. All works in the vicinity of ESB Networks infrastructure will be carried out in ongoing consultation with ESB Networks and will be in compliance with requirements and guidelines including procedures to ensure safe working practices are implemented when working near live overhead/underground electrical lines. The proposed development will not result in any significant effects on grid capacity but will provide a potentially positive effect on the electricity supply infrastructure.	
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Telecommunications	Should any impacts due to T17 on the Eir radio link from Slieveveagh to Tooreen occur the following mitigation solutions will be carried out: - Re-locate the antenna at Tooreen to the new telecoms mast which has been installed at Tooreen. - Route the EIR Service into Tooreen from an Alternative Feeder Site. These mitigation measures are described in more detail in the Telecommunications Impact Assessment and have also been included below. An option for mitigation for any potential impacts on the radio link between Slieveveagh and Tooreen would be to relocate the radio antenna at Tooreen from the existing 12m telegraph pole to the new 24m high lattice telecoms mast which has been recently installed at site. An alternative option to mitigate for any potential impacts on the radio link between Slieveveagh and Tooreen would be to use an alternative Eir POP site to provide a service into Tooreen. In addition to the preceding, in the event of interference to television and telecommunication services arising from the wind farm development, the applicant will work with telecommunication providers to remedy any issues of interference to affected communication links. Appropriate mitigation measures can be implemented such that there will either be an imperceptible effect, or no effect, on surrounding reception as a result of the proposed development, with the solution to interference with TV	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			reception or communication links dependent on where the residence receives signal from. As standard practice, a signed Protocol between the developer and RTE will be put in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development. All telecommunications lines with the potential to be temporary affected by the grid route or TDR accommodation works will be identified prior to construction.	
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Aviation	Whilst the proposed development will not impede aircraft, IAA Electronic Air Navigation Obstacle Data set identified obstacles as objects whose height above ground level is 90m or higher, affecting air navigation. Irish Wind Energy Association (IWEA) Guidelines have set out the following measures to ensure that pilots of aircraft are fully aware of the presence of wind turbines. • All turbines and meteorological masts having a height of 90m, or more are promulgated in the Irish Air Navigation Obstacle database; • Wind turbines or any structure exceeding 90m in height may require appropriate aviation warning lighting as agreed with IAA; • The IAA should be informed 30 days in advance or the erection of any structure exceeding 45m in height. Having regard to the prior measures: • If permitted, the wind farm will be fitted with Aeronautical Obstacle Warning Lights in accordance with civil aviation industry and regulatory standards. Subject to further consultation with the IAA. • The developer will provide the IAA with as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location.	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The developer will notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.	
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Water and Wastewater Infrastructure	There is existing watermain located along the R516 to the north of the proposed development as well as a watermain located along the L1414 which is located between the north and south sections of the proposed development. There are also watermain underground along the grid route including the R512 road where most of the grid connection is located. The Contractor will put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with Uisce Éireann or other relevant authorities. All works in the vicinity of water and wastewater infrastructure will be carried out in ongoing consultation with the local authorities and service providers and will be in compliance with any requirements or guidelines they may have.	Site Environmental Manager
DURING CONSTRUCTION	Chapter 17 Material Assets – Built Services	Waste Management	All waste for offsite treatment/disposal is to be stored temporarily in appropriate storage areas. The areas in which wastes are stored on site are segregated to prevent material and contaminated surface water runoff entering local surface water drains. All chemical, hydrocarbon or other controlled wastes will be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required. All waste to be removed from site will be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice and the site waste management plan as discussed in the CEMP as included in this EIAR Volume III, Appendix 2A. All personnel working on site will be trained in pollution incident control response, and an emergency response will be prepared as part of the CEMP.	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 02 Description of the Proposed Development	Maintenance & Benefits	Each wind turbine will be computerised to control critical functions, monitor wind conditions and report data back to a SCADA system. An anemometer mounted on the top of the wind turbine nacelle provides wind speed information used to automatically set blade pitch and control the wind turbine. A wind vane mounted on top of the nacelle provides information needed to yaw the wind turbine into the wind. The SCADA system monitors numerous parameters and diagnoses potential issues. If a problem causes a wind turbine to shut down, the wind turbine will either be restarted by the SCADA system operator, or service personnel will perform the necessary repairs and then manually restart the wind turbine. In addition, the wind turbine can also be controlled manually at the nacelle, from a panel inside the base of the tower, or from a remote computer via the SCADA system. Using the tower top control panel, the wind turbine can be stopped, started, and turned to a safety position. Turbines can be programmed to shut down during periods when shadow flicker is predicted to occur. Shadow flicker control modules will be installed on the appropriate turbines which can be programmed to shut down to eliminate the occurrence of shadow flicker at any particular dwelling. Turbines will be fitted with shadow flicker control modules to ensure that the proposed wind farm will comply with existing guideline thresholds and also eliminate flicker at receptors. This is detailed in EIAR Volume II, Chapter 15 Shadow Flicker. <i>Turbine Maintenance</i> During the operation of the wind farm, the turbine manufacturer, the Developer or a service company will carry out regular maintenance of the turbines on a weekly basis. Other likely schedule of visits to the site during the operational phase is as follows: The regional supervisor will visit the site 2 times per month, civils maintenance will occur as needed and will likely take place twice per year, substation maintenance will occur once per year and the Original Equipment Manufacturer (OEM) will inspect the wind turbines twice per year or as needed if specific issues are identified. During the life of the proposed development, it is envisaged that at least two permanent jobs will be created locally in the form of an operator or maintenance personnel. In addition, operation and monitoring activities may be carried out remotely with the aid of computers connected via a	Site Operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			telephone broadband link. However, routine inspection and preventive maintenance visits will be necessary to ensure the smooth and efficient running of the wind farm. Grid Maintenance During the operational phase the grid connection cable will remain <i>in situ</i>. It is unlikely that the underground cable will require maintenance during its operation but in the event a fault does occur, inspection of the fault will be carried out to determine what works to the ducting/cabling may be required. Community Benefit Under the Renewable Electricity Support Scheme (RESS) all renewable electricity generation projects must establish a Community Benefit Fund to be used for the wider economic, environmental, social and cultural well-being of the local community. The contribution is set at €2 per Megawatt hour of generation of the RESS Project. This means there are real and quantifiable funds being made available annually for the benefit of the local community. The Fund will be aligned to incentivise investment in local renewable energy, energy efficiency measures and climate action initiatives. The key stakeholders involved in the Community Benefit Fund are the Community, the Fund Committee, the Developer and the Administrator. For the proposed project, the community benefit funds under RESS is expected to deliver approximately €350,000 per year which will contribute to a near neighbour scheme and sustainable community initiatives in line with the latest RESS guidelines.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 05 Population and Human Health	Shadow Flicker	Shadow Flicker Control Modules (SFCM) are a standard element of commercial wind turbine packages which requires the identified dates and times of day of potential occurrence of shadow flicker at dwellings within the shadow flicker study area to be inserted into the SFCM computer program. This software considers factors such as weather conditions, which will then automatically stop each wind turbine at times when shadow flicker could otherwise occur within any of the houses within the study area. Once the conditions for shadow flicker to occur no longer apply (e.g. when the sun has passed the relevant position in the sky or once it has been clouded over), the wind turbine is restarted.	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The shadow flicker computer model assessment provides very detailed information, down to the exact times of day when shadow flicker is predicted to occur and from which turbine for each receptor. This information will be used to program the shadow flicker modules to eliminate shadow flicker at receptors making sure it does not occur at any property. Following the implementation of this mitigation, the proposed development will be fully compliant with the 2006 WEDGs, and no residual significant effects on human health or population are expected.	
POST CONSTRUCTION / OPERATIONAL PHASE	Chapter 06 Biodiversity	Protection of Watercourses and Downstream Designated Sites	Mitigation measures to protect water quality during the operational phase of the Development are detailed in Chapter 09 Water and included below. - Fuel, lubricating oil, hydraulic fluid may be required as part of standard maintenance activities during the operational phase. For the vehicles and equipment that will be brought to the Development during operation, refuelling will be carried out using 110% capacity double bunded mobile bowsters. - Chemicals may be brought to the Development for maintenance works during the operational phase, some of which could be consider hazardous. Care will be taken with the usage and disposal of any fuel, oils and chemicals at the Development. Any hazardous waste generated at the Development will be disposed of to the licenced waste facility. - Surface water will be managed in accordance with the principles and objectives of Sustainable Urban Drainage Systems (SuDS) to treat and attenuate water prior to outflow. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the Development. - Foul water arising from welfare facilities during the operational phase of the Development will be collected in an onsite holding tank and removed periodically by a licenced contractor. The implementation of these measures will ensure that a deterioration in water quality in downstream European and nationally designated sites will	Site Operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			not occur such that aquatic species and habitats associated with these sites do not experience any likely significant adverse effects.	
POST CONSTRUCTION/OPERATIONAL PHASE	Chapter 06 Biodiversity	Other Mammals (Bat Species)	There are currently no peer-reviewed studies that directly evaluate the effectiveness of retaining a buffer between wind turbines and bat habitat features (such as roosts, foraging areas, or commuting routes) on bat populations. However, several guidance documents and expert recommendations do propose buffer distances based on precautionary principles and indirect evidence: NatureScot's (2021) guidance recommends implementing a 50 m exclusion buffer from the blade tip of a wind turbine to the nearest key habitat feature (such as roosting sites, foraging areas, or commuting corridors for bats). This buffer is a precautionary measure, applied universally to all proposed turbines, to reduce the likelihood of bats being exposed to collision risks from the turbine, particularly in areas where bats are known to roost or forage. Where the exclusion buffer cannot be effectively implemented (townland boundary etc.), adaptive and flexible buffer designs have been explored. Where adaptive habitat mitigation cannot be applied, alternative measures will be implemented, for example, where field boundary hedgerows are retained within the buffer zone during operational phase, smart curtailment will be implemented for the lifetime of the project. The retained hedgerows within buffer zones will be managed in accordance with the All-Ireland Pollinator Plan, which promotes biodiversity enhancement through sensitive hedgerow management. This includes allowing flowering and fruiting cycles to support pollinators, while maintaining the structural integrity of the hedgerow as a commuting and foraging corridor for bats. This dual-function approach ensures that hedgerows contribute to both bat conservation and pollinator support, without increasing collision risk, provided curtailment protocols are in place. See HSMP (Appendix 6I) for habitat management measures of bat buffers to maintain vegetation in the desired condition ensuring the effectiveness of the bat buffers. Bat buffer habitat management measures will be undertaken throughout the lifespan of the Development, as required.	Site Operator

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			Turbines will operate in a manner which restricts the rotation of the blades as far as is practicably possible below the manufacturer’s specified cut-in speed. This is usually achieved by feathering the blades during low wind speeds; the angle of the blades is rotated to present the slimmest profile possible towards the wind, ensuring they do not rotate or ‘idle’ when not generating power. Turbine blades spinning in low wind can kill bats, however bats cannot be killed by feathered blades which are not spinning (Horn et al., 2008). The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities from 30% to 90% (Arnett et al., 2008, 2011; Baerwald et al., 2008). As such, the feathering of blades to prevent ‘idling’ during low wind speeds is proposed for all turbines. Bat feature buffers are effective in reducing turbine collisions for high-risk collision bat species, such as common and soprano pipistrelles, which commute and forage along forest edges. However, they may be less effective for species like Leisler’s bat and Nathusius’ pipistrelle that regularly commute and forage at turbine height in open areas. While Nathusius’ pipistrelle have low activity levels, a precautionary approach has been taken to include this species in the mitigation. Therefore, for Leisler’s bat and Nathusius’ pipistrelle species, a turbine curtailment regime will be implemented as a mitigation measure from the start of operation, as per NatureScot 2021, Rodrigues <i>et al.</i>, 2015 and Reason & Wray, 2023. This mitigation measure technique has been documented to reduce bat fatalities rates substantially and effectively at wind farms (Voigt et al. 2022) with minimal impact on power generation. A recent study in Canada estimated that feathering wind turbines when windspeed was lower than 5.5 m/s between 6 pm of one day and 6 am the following day would result in only a 0.43% loss of total energy production (Thurber et al., 2023). While the majority of activity recorded within the Study Area was recorded at wind speeds below the manufacturers recommended cut-in speed of 3 m/s, the data was only collected for the recommended one year (NatureScot 2021). Taking a precautionary approach, and based on the site being of moderate to high potential for collision for high risk species, it is recommended a smart curtailment strategy is put in place for the turbine locations with the highest risk or where linear features (hedgerow and treelines) are not being removed as part of the buffer	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			exclusion zone. This mainly involves the turbines within the north of the Site, T1, T2, T3, T4, T5, T6 and T7 and T14. T3, T6, T12 and T14 are where linear features are not being removed. 43% of Leisler’s activity occurred during the spring season and 57% the autumn season; while 94% of Nathusius pipistrelle activity occurred during the autumn season. Therefore, based on the observed Leisler’s and Nathusius activity, it is recommended that the turbines T1-T7 are curtailed during the spring (May to June) and autumn (mid-August to end-October) at wind speeds between 3 and 5 m/s at ground level. There is no correlation between activity and temperature for the data collected, therefore, no temperature range has been set. The turbines where linear features being retained within the bat buffer will require smart curtailment at wind speeds between 3 and 5 m/s at ground level for the full activity season of year one and then be refined as below for the lifetime the project. Curtailment will be monitored for year one of operation in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is considered to be incidental), and (b) whether the curtailment regime can be fine-tuned so that turbine down-time is minimised while ensuring the strategy remains effective in preventing casualties (NatureScot, 2021). Efficacy of smart curtailment Whitby et al. (2024) collated data from publicly available studies that evaluated curtailment strategies (including smart curtailment options) at six wind energy facilities in North America over a 10-year period. This analysis revealed that curtailment reduced total bat fatalities by 33% for every 1.0 m/s increase in the curtailment wind speed. Across multiple facilities and years, a 5.0 m/s cut-in speed was estimated to reduce total bat fatalities by an average of 62% (95% CI: 54%-69%). Mortality reductions at individual facilities in any given year were estimated to range from 33% to 79% (95% prediction interval). The study also found that inter-annual differences, rather than variations between sites or turbine characteristics, accounted for the majority of the observed variation in efficacy rates. Overall, Whitby et al. (2024) concluded that curtailment, including smart curtailment approaches, is an effective strategy for reducing bat fatalities at wind energy facilities. Other studies investigating similar curtailment systems have produced comparable results. These include the work by Gottlieb et al. (2024) and	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Newman et al. (2024). In the Gottlieb et al. (2024) study, the Renewable Energy Wildlife Institute (REWI) led a collaborative team of scientists, wind developers, and turbine manufacturers to develop and test a "smart curtailment" system designed to mitigate bat collisions with wind turbines. The results of this study indicated that turbines utilising both smart curtailment and blanket curtailment exhibited significantly lower bat fatality rates (32% and 31%, respectively) when compared to control turbines. However, the study did not find a significant difference in fatality rates between turbines employing smart curtailment and those using blanket curtailment. Where lighting is to remain on Site (e.g., substation and entrances) measures outlined in the construction phase will be maintained throughout the lifetime of the Development. As aviation lighting is a safety requirement, no mitigation with regards to bats will be implemented. Should ultra-violet filters be available at the time of construction, these will be used on all lighting within the Development. Where human presence and machinery are used during the operational phase, the measure outlines in the construction mitigation will be maintained throughout the lifetime of the Development.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 06 Biodiversity	Other Mammals	Otter Mitigation measures to protect water quality during the operational phase of the Development are detailed in Chapter 9: Hydrology & Hydrogeology and include the incorporation of SuDS measures to treat and attenuate water prior to outfall. Foul water during the operational phase be collected in an onsite holding tank and collected periodically by a licenced contractor. The implementation of these measures will ensure that a deterioration in water quality in will not occur such that otters will not experience any likely significant effects. Aquatic Ecology Mitigation measures to protect water quality during the operational phase of the Development are detailed in Section 6.8.2.1.1, as per Chapter 9 Hydrology & Hydrogeology, and include the incorporation of SuDS measures to treat and attenuate water prior to outflow. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Development.	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Foul water during the operational phase be collected in an onsite holding tank and collected periodically by a licenced contractor. The implementation of these measures will ensure that a deterioration in water quality in downstream watercourses will not occur such that aquatic species and habitats associated with these do not experience any likely significant adverse effects.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 07 Ornithology	Mitigation	During the operational phase, a comprehensive programme of habitat management, turbine operation mitigation, deterrence, and ongoing monitoring will be implemented, in accordance with the Whooper Swan Management Plan (WSMP, Appendix 7D). The principal aim is to safeguard the long-term viability of swan usage within the Development and surrounding landscape whilst minimising the risk of displacement, disturbance, or collision to wintering whooper swans. Adaptive management will ensure mitigation remains responsive to observed swan behaviour, habitat condition, and turbine interaction over time. Contingency measures, including temporary curtailment or additional deterrents, will be deployed if swans are observed in unsafe proximity to turbines, with actions informed by the operational-phase monitoring programme. Habitat Enhancement and Maintenance <i>Sward management</i> - Continue rotational grazing and/or cutting to maintain a sward height of 5-10cm, optimising forage accessibility. - Apply slurry or lime before 1 October to support autumn sward productivity. Application should follow guidance on nitrate vulnerable zones to avoid runoff and support biodiversity. <i>Water Retention</i> - Maintain and monitor wetland areas and shallow pools to ensure persistent damp ground throughout the winter period. - Adjust hydrology as needed to prevent desiccation or excessive poaching. <i>Soil Fertility</i> - Conduct periodic soil testing to monitor nutrient status. - Amend soil fertility as necessary to sustain palatable sward composition and biomass production. Habitat Deterrence Around Turbines <i>Sward Composition Management</i>	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			- In turbine-adjacent fields (particularly near T3), actively suppress ryegrass dominance through mechanical means or overseeding with less palatable grasses. - Avoid any nutrient applications after 1 October in these areas to deter grazing or loafing by swans. <i>Post-and-Flag Deterrents</i> - Deploy physical deterrents (e.g. posts with flags or tapes) reactively in fields where swans are observed near turbines. - Maintain deterrents until vegetative deterrence measures (e.g. sward unpalatability) prove effective. <i>Turbine Operation Mitigation</i> To minimise the collision risk to wintering whooper swans during the operational phase of the Development, a targeted curtailment protocol will be implemented at turbines located within or adjacent to areas of high swan activity. This approach prioritises responsiveness to real-time swan behaviour and environmental conditions, while remaining grounded in long-term monitoring and modelling outputs as outlined in the Whooper Swan Management and Monitoring Plan (WSMP; Appendix 7D). - Initial Curtailment Strategy: - Apply a full curtailment of turbines T1–T4 during the first operational winter (October–March), allowing swans to habituate to the Development in the absence of operational rotor movement (to be reviewed post-season to determine whether continued or modified measures are warranted). - Priority Curtailment Zones: - Focus curtailment at turbines in high-risk zones, especially T3 and those adjacent to Camas South. - Implement a dynamic curtailment protocol based on real-time observations, with shutdowns triggered by swan activity, proximity to turbines, time of day, weather conditions, and flight direction. - Curtailment Protocol: - Turbines in Priority Curtailment Zones will be subject to temporary shutdowns or blade idling during high-risk periods, guided by the following criteria: - Time of Day: Morning and evening roost flights (typically dawn and dusk).	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			- Seasonality: Active from October–March, encompassing the full wintering season. - Weather Conditions: Activation during low visibility, fog, low cloud ceiling, or strong crosswinds, which reduce detectability and safe manoeuvring of swans. - Swan Activity: Real-time or near-real-time detection of swans flying within proximity of turbines, or observations of flocks assembling for movement.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 08 Land and Soils	Change of land use	The potential effect on the land and soils of the proposed development due to excavations will be significantly lower during operation and maintenance, as the majority of excavations will have been reinstated. Some erosion of soil may continue into the early operation phase, however as vegetation becomes established and equilibrium is achieved, erosion rates will reduce to normal levels. No additional mitigation measures are required in relation to land use for the soil and geological environment during the operation of the proposed development.	Wind farm operator
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 08 Land and Soils	Soil and geology	All vehicular movement during operation and maintenance will be restricted to the areas of hardstanding and existing/newly constructed access tracks. The volume of traffic during the operational phase will be greatly reduced in comparison with the construction phase. The potential effect on slope stability will therefore be minimal. The risks associated with sedimentation and contamination of the watercourses and aquifers due to erosion and runoff will be significantly reduced as areas are revegetated and construction/forestry traffic ceases. Drainage swales will continue to be monitored.	Wind farm operator
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 08 Land and Soils	Accidents and spills	Mitigation measures for oils and fuels remain the same as the construction phase, however these risks will be significantly reduced during the operation stage as maintenance of the turbines, substation and maintenance vehicles is all that is required. Turbine transformers will be located within the turbines, so any leak of oil would be contained within or adjacent to the turbine. Minimal refuelling or maintenance of operational vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station. Any on site re-fuelling will be undertaken using a double skinned bowser with spill kits at the ready for accidental leakages or spillages. A minimal amount of fuel will be stored on site. Storage areas where required will be bunded appropriately for the	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			fuel storage volume during the operational phase and will be fitted with a storm drainage system and an appropriate oil interceptor. The plant used will be regularly inspected for leaks and fitness for purpose. These measures will be sufficient to reduce the risk of contamination to soil and subsoils, and groundwater and surface water quality. An emergency plan for the operational phase to deal with accidental spillages will be prepared and will be communicated to plant operatives. Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area. The substation transformer oil storage tanks will be in a concrete bund capable of holding 110% of the oil in the transformer and storage tanks. Any wastewater will be removed offsite by a licensed contractor.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 09 Water	Water Quality	It is anticipated that fuel, lubricating oil, hydraulic fluid may be required as part of standard maintenance activities during the operational phase. For the vehicles and equipment that will be brought to the proposed development during operation, refuelling will be carried out using 110% capacity double bundled mobile bowsers. Chemicals may be brought to the proposed development for maintenance works during the operational phase, some of which could be considered hazardous. Care will be taken with the usage and disposal of any fuel, oils and chemicals at the proposed development. Any hazardous waste generated at the proposed development will be disposed of to the licenced waste facility. Surface water will be managed in accordance with the principles and objectives of SuDS to treat and attenuate water prior to discharging via either overland (and allowed to infiltrate to ground) or to an existing drainage ditch in the case of the IPP & SS compounds. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the proposed development. The wastewater generated during the operational phase will be managed by a holding tank which is of twin-hull design and fitted with an alarm to indicate levels and when it is due for empty. The holding tank will be emptied by a permitted contractor and treated at a licenced facility. The proposed development will not cause a potential impact on water quality	Wind farm operator and/or Appointed contractor

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			and the WFD status of receiving waterbodies and any Natura 2000 sites associated with discharges from the site.	
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 13 Noise and Vibration	Noise Levels	The noise levels associated with the Proposed Development have been assessed using best practice contained in the 'Wind Energy Development Guidelines for Planning Authorities, 2006' and have been assessed following guidance from ETSU-R-97 and the IOA GPG and its supplementary guidance notes, and no likely significant effects are predicted to arise during the operational phase. No specific mitigation measures are therefore required. If the Proposed Development is permitted and constructed, a post-commissioning noise surveys will be carried out in accordance with best practice. A suitable Noise Compliant Monitoring Programme (NCMP) will be implemented for the Proposed Development. Should a noise complaint or evidence of an exceedance of the noise limits occur, a detailed assessment and appropriate mitigation measures such as a curtailment programme on the wind turbine operations will be undertaken. The NCMP will follow the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014). In the unlikely event that an issue with any special audible characteristic is associated with the Proposed Development, an appropriate detailed investigation will be undertaken and due consideration shall be given to the appropriate guidance on conducting such an investigation. On-site electrical Substation The impact assessment has demonstrated that there is no likely significant effect with respect to Noise and Vibration at the NSLs, therefore no mitigation measures are required.	Wind farm operator
POST CONSTRUCTION /OPERATIONAL PHASE	Chapter 15 Shadow Flicker	Wind Turbine Control Measures	A programmable shadow flicker module will be installed in order to allow the control of turbines to eliminate shadow flicker at a receptor. Shadow Flicker Control Modules (SFCM) is a standard element of commercial wind turbine packages which requires the identified dates and times of day of potential occurrence of shadow flicker at dwellings within the shadow flicker study area to be inserted into the SFCM computer program. This software considers factors such as weather conditions, which will then automatically stop each wind turbine at times	Site Environmental Manager

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			when shadow flicker could otherwise occur within any of the houses within the study area. Once the conditions for shadow flicker to occur no longer apply (e.g. when the sun has passed the relevant position in the sky or once it has been clouded over), the wind turbine is restarted. The shadow flicker computer model assessment provides very detailed information, down to the exact times of day when shadow flicker is predicted to occur and from which turbine for each receptor. This information will be used to program the shadow flicker modules to eliminate shadow flicker making sure it does not occur at any property. Following the implementation of this mitigation, the proposed development will be fully compliant with the 2006 WEDGs, and no residual significant effects on human health or population are expected. Should the Draft Revised Wind Energy Development Guidelines (2019) be formally adopted, the same control system can be adapted to meet the updated requirements. The development is therefore not only compliant under current policy but also future-proofed for alignment with forthcoming regulatory changes.	
DECOMMISSIONING	Chapter 02 Description of the Proposed Development	Reinstatement	Wind Farm At the end of the 35-year lifespan of the proposed development, the Developer will make the decision whether to repower or decommission the turbines. Any further proposals for proposed development, including repowering, at the site during or after this time will be subject to a new planning permission application. If planning permission is not secured at the end of life of the turbines, the site will be decommissioned and reinstated with all 17 No. wind turbines removed. Removal of infrastructure will be undertaken in accordance with this chapter and commitments arising from any conditions attached to a grant of permission, in conjunction with other landowner, regulatory requirements and best practice applicable at the time. The information below outlines the proposed decommissioning tasks based on current requirements and best practice. Prior to the decommissioning work, the following will be provided to Limerick City and County Council for approval: A detailed plan outlining measures to ensure the safety of the public and workforce and the use of best available decommissioning techniques at the time.	Wind Farm Operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			A comprehensive reinstatement proposal, including the implementation of a programme that details the removal of all structures and landscaping. Wastes generated during the decommissioning phase will be taken off site and disposed of at an authorised waste facility in accordance with the provisions of the RWMP (EIAR Volume III, Appendix 2B). Any materials suitable for recycling will be disposed of in an appropriate manner. It is anticipated that internal underground cables connecting the proposed turbines to the proposed on-site substation will be cut back and left underground in order to minimise disruption from construction and the potential for environment effects. The cables will not be removed if an environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them <i>in situ</i>. The assessment will be carried out closer to the time to take into account environmental changes over the project life. Hardstand and turbine foundation areas will be left <i>in situ</i> and covered with soil to match the existing landscape. Access tracks will be left <i>in situ</i> for agricultural use. Grid Connection The grid cable will be taken in charge by EirGrid on commissioning of the proposed development and remain a permanent part of the national electricity grid and therefore decommissioning is not foreseen. In the event of decommissioning, it will involve removing the cable from the ducting but leaving the ducting and associated supporting structure in place. Similarly, the proposed on-site substation will be taken in charge of by EirGrid on commissioning and will remain in place and will form part of the national electricity grid.	
DECOMMISSIONING	Chapter 04 Civil Engineering		It is anticipated that internal underground cables connecting the proposed turbines to the proposed on-site substation will be cut back and left underground in order to minimise disruption from construction and the potential for environment effects. The cables will not be removed if an environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them <i>in situ</i>. The assessment will be carried out closer to the time to take into account environmental changes over the project life.	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Upon decommissioning, turbine foundations will be covered with soil and reseeded. The substation will remain in place as part of the permanent electrical infrastructure. Hardstand areas will be remediated to match the existing landscape thus requiring reforestation or return to grassland by placing topsoil and grass seed. Access tracks will be left for use by the landowner. Any structural materials suitable for recycling will be disposed of in an appropriate manner. Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Some of the potential issues include: • Potential disturbance to the community, flora and fauna by the presence of personnel on-site, heavy goods vehicles and cranes. • On-site temporary compound will be located appropriately. • Time of year and time-scale (to be outside sensitive periods); and • Access tracks (tracks may remain in use for the benefit of the landowner). Prior to the decommissioning work, a plan will be drawn up to ensure the safety of the public and workforce and the use of best available techniques at the time. Prior to the decommissioning work, a comprehensive reinstatement proposal, including the implementation of a program that details the removal of all structures and landscaping, will be submitted to the planning authority for approval. Wastes generated during the decommissioning phase will be taken off site and disposed of appropriately by a licensed waste operator. Grid Connection The grid cable will remain a permanent part of the national grid and therefore decommissioning is not foreseen. In the event of decommissioning, it will involve removing the cable from the ducting but leaving the ducting and associated supporting structure in place. The ducting will not be removed if the environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them in situ. The assessment will be carried out closer to the time to consider environmental changes over the project life. The removal of the ducts would also cause some limited disruption to road users.	

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			Leaving the ducts in place would avoid disruption to road users without compromising the structure of the roadway. The substation will remain in place and will previously have been taken in charge by the system operator, after the wind farm is connected to the national electricity grid.	
DECOMMISSIONING	Chapter 06 Biodiversity	Biodiversity	Mitigation measures, described for the construction phase and which are relevant to decommissioning, updated to reflect good practice at the time, will be implemented for the decommissioning phase. The implementation of similar mitigation measures, as detailed for the construction phase will help ensure that all decommissioning phase adverse effects are minimised or avoided. Therefore, it is proposed that a Decommissioning Plan will be drafted prior to the removal of the Development infrastructure. This will detail specific actions aimed at protecting IEF's. As for the construction phase, these will include limitations on the working corridor, minimised effects of vegetation, protection of water quality and protection of protected fauna. A pre-decommissioning walkover survey will be undertaken with the specific objective of identifying any species of nature conservation importance that may be affected by the decommissioning phase and works timed accordingly to avoid sensitive periods. Prior to the Decommissioning Phase, a comprehensive plan will be drawn up that takes account of the findings of this EIAR and the contemporary best practice at that time, to manage and control the component removal and ground reinstatement.	Wind farm operator
DECOMMISSIONING	Chapter 07 Ornithology	Ornithology	The decommissioning phase, although temporary, has the potential to cause short-term disturbance to wintering whooper swans, particularly if activities coincide with the non-breeding season. The decommissioning approach will aim to minimise disturbance, protect key habitats at Camas South, and ensure that any residual impacts are mitigated. Most concrete infrastructure will remain in place, limiting the extent of habitat disturbance during decommissioning. Mitigation measures, described for the construction phase and which are relevant to decommissioning, updated to reflect good practice at the time, will be implemented for the decommissioning phase.	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The implementation of similar mitigation measures, as detailed for the construction phase will help ensure that all decommissioning phase adverse effects are minimised or avoided. Therefore, it is proposed that a Decommissioning Plan will be drafted prior to the removal of the Development infrastructure. This will detail specific actions aimed at protecting IOF's. As for the construction phase, these will include limitations on the working corridor, minimised effects of vegetation, protection of water quality and protection of breeding and foraging species. Pre-decommissioning surveys will be undertaken with the specific objective of identifying any IOF's that may be affected by the decommissioning phase and works timed accordingly to avoid sensitive periods. Prior to the Decommissioning Phase, a comprehensive plan will be drawn up that takes account of the findings of this EIAR and the contemporary best practice at that time, to manage and control the component removal and ground reinstatement.	
DECOMMISSIONING	Chapter 08 Land and soils	Land and soils	Where appropriate, mitigation measures used during decommissioning activities shall be comparable to those used during construction. By keeping some development components in place, when necessary, some of the effects will be avoided. In order to recover vegetation and lessen the effects of runoff and sedimentation, the turbine bases will be rehabilitated by being covered with local topsoil. Access tracks that are not needed for farming or forestry will also be allowed to naturally revert to vegetation. The wind farm's materials and equipment will all be removed from the site and disposed of or repurposed in a way that is environmentally responsible. There will be mitigation measures put in place to prevent potential pollution from fuel leaks and soil compaction caused by nearby plants.	Wind farm operator
DECOMMISSIONING	Chapter 09 Water	Water quality	Effects will be avoided by leaving elements of the Proposed Development in place where appropriate as described in Chapter 02: Description of the Proposed Development. The onsite substation will likely be retained. The turbine bases will be rehabilitated by covering with local topsoil in order to regenerate vegetation which will reduce runoff and sedimentation effects. Internal tracks will remain. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by onsite plant will be implemented as per the construction phase mitigation measures.	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			The potential impacts on the water environment during the decommissioning stage will be similar to those during the construction phase, and as such the proposed mitigation for the Decommissioning Phase are the same. Moreover, due to the relative long life of the wind farm infrastructure, it is likely that a revised/updated environmental assessment will be required at the time of decommissioning to account for any changes in baseline conditions at the Proposed Development site, and potential changes in assessment guidelines and legislation.	
DECOMMISSIONING	Chapter 10 Air quality	Air Quality	Effects resulting from the decommissioning phase are expected to be similar in nature, however smaller in scale in comparison to the construction phase. A decommissioning plan will be agreed with the planning authority prior to the commencement of decommissioning. This plan will include the following measures: - Water will be used as a dust suppressant where required e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise; - Public roads will be inspected regularly for cleanliness and cleaned as necessary; - All loads entering and leaving the site will be covered during dry periods, to protect from dust; - Vehicle speeds will be controlled when passing over access tracks and crane hardstanding areas within the site; and - Daily site inspections will take place to examine dust measures and their effectiveness.	Wind farm operator
DECOMMISSIONING	Chapter 11 Climate	Climate	The wind turbines are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of machines, subject to planning permission being obtained, or the site will be decommissioned fully, with the exception of the electricity substation and site tracks and drainage. Upon decommissioning of the proposed wind farm, the wind turbines will be disassembled and removed off-site for recycling. Turbine foundations will remain in place underground and along with hardstands will be allowed to revegetate naturally. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete and stone from the ground could result in potentially needless environment disturbances	Wind farm operator

TIME FRAME / SCHEDULE	Chapter/Appendix	Referring to	ENVIRONMENTAL MITIGATION / RECOMMENDATION	Person(s) Responsible
			such as noise, dust and/or vibration and the associated expenditure of energy of removing them. A detailed decommissioning plan will be agreed in advance of works taking place with Limerick City and County Council. The plan will include mitigation measures as per the IEMA GHG Management Hierarchy (IEMA 2020b).	
DECOMMISSIONING	Chapter 13 Noise and Vibration	Noise and Vibration	Activities and noise levels associated with the decommissioning phase are expected to be similar to the construction phase. The mitigation measures that will be considered in relation to any decommissioning of the site are the same as those proposed for the construction phase of the Proposed Development.	Wind farm operator
DECOMMISSIONING	Chapter 16 Traffic and Transport	Grid Cable and Substation	A detailed description of the proposed decommissioning phase is provided in Chapter 02 Description of the Proposed Development of this EIAR. The grid cable and substation will remain a permanent part of the national grid infrastructure and, therefore, their decommissioning is not expected. At the end of the 35-year lifespan of the proposed development, the Developer will make the decision whether to repower or decommission the turbines. Any further proposals for proposed development at the site during or after this time will be subject to a new planning permission application. If planning permission is not sought after the end of life of the turbines, the site will be decommissioned and reinstated with all 17 wind turbines removed. Traffic and transportation effects would be similar to the construction phase albeit at a lesser extent should decommissioning occur.	N/A

19.3 References

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