Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Gannow Renewable Energy Development, Co. Galway

Chapter 18 – Schedule of Mitigation and Monitoring Measures

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18. SCHEDULE OF MITIGATION & MONITORING PROPOSALS

All mitigation and monitoring measures relating to the pre-commencement, construction, operational and decommissioning phases of the Proposed Project are set out in the relevant chapters of this EIAR.

All mitigation which will be implemented during the various phases of the Proposed Project are presented in Table 18-1 below. The mitigation measures have been grouped together according to their EIAR Chapter and Proposed Project phase and are presented under the following headings:

- Pre-Commencement Phase
- Construction Phase
- Operational Phase
- Decommissioning Phase

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during each phase of the Proposed Project. The proposals for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-5 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during each Proposed Project phase to provide a reporting template for site compliance audits.

All monitoring measures which will be implemented during the pre-commencement, construction, operational and decommissioning phases of the Proposed Project are outlined in Table 18-2. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring proposals are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring proposals in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the Proposed Project to ensure all the required monitoring is completed as required.

It is intended that the CEMP will be updated where required prior to the commencement of construction to include all mitigation and monitoring measures, planning conditions and or alterations to the EIAR and application documents should they emerge during the course of the planning process and would be submitted to the Planning Authority for written approval prior to the commencement of development.

18.1 EIAR Mitigation Measures

Table 18-1 Schedule of Mitigation

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Environmental Management	EIAR Chapter 4	› All proposed activities on the Site will be provided for in a Construction and Environmental Management Plan (CEMP). A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. › The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, peat and spoil management, waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR and NIS. The contractor will be contractually obliged to comply with all such measures. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.		
MM2	Environmental Management	CEMP Section 4	› The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site.		

			› The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. The ECoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the ECoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Proposed Contractor, having been nominated by the developer to fulfil the role. › The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.		
MM3	Surface Water Quality	CEMP Section 4 EIAR Chapter 9	› Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. › Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-6 of Chapter 9 of the EIAR. › Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell.		
MM4	Concrete Deliveries	EIAR Chapter 4 CEMP Section 3	› The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures. › Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. › Before leaving the site, washing of the delivery truck will be minimised and restricted to designated wash out areas. Wash out will be restricted to the concrete lorry's chute only.		

MM5	Site Drainage Plan	EIAR Chapter 4 CEMP Section 3	› The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the Site to set out and assist with micro-siting of proposed drainage controls as outlined in Section 4.6 of the EIAR. › Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Section 3 of the CEMP. The key principles of drainage design that will be implemented and adhered to as part of the Proposed Project are as follows: › Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge as diffuse overland flow or for rewetting of land. › Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land. › No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses. › Where possible, maintain 50-metre watercourse buffer zones for the wind turbines. › No alteration of natural watercourses. › Maintain the existing hydrology of the Site. › Blocking of existing manmade drainage as appropriate. › Daily inspection and recording of surface water management system by on-site Environmental Clerk of Works and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Site.		
MM6	Preparative Site Drainage Management	EIAR Chapter 4 CEMP Section 3	› Drains will be excavated, and silting ponds constructed to eliminate any suspended solids within surface water running off the Site. › An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed		

			drainage measures will be installed prior to, or at the same time as the works they are intended to drain.		
MM7	Drainage Inspection	EIAR Chapter 4, 9 CEMP Section 3	› Prior to commencement of works in sub-catchments across the Site, main drainage inspections will be completed to ensure ditches are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by catchment basis as the construction works develop across the Site, as works in all areas will not commence simultaneously.		
MM8	Watercourse Inspection	EIAR Chapter 4 CEMP Section 2	› Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM9	Drainage Maintenance	CEMP Section 2 Chapter 9	› An inspection and maintenance plan for the on-site drainage system will be prepared in advance of commencement of any works. Daily visual inspections of drains and outfalls will also be performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. Should the suspended solids levels measured during construction be higher than the existing levels, the source will be identified, and additional mitigation measures implemented. › Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.		
MM10	Earthworks	CEMP Section 3	› Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.		

MM11	Felling	EIAR Chapter 4 Appendix 4-4 CEMP Section 3	› Before the commencement of any felling works, an experienced and competent ECoW shall be appointed to oversee the keyhole and extraction works. › Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing, water crossings and on-site storage facilities for fuel, oil and chemicals will be carried out by the ECoW. › Before the commencement of felling all operators will be fully briefed on the harvest plan including potential hazards and environmental sensitivities and corresponding protective measures on site. › Advance notice and safety signage will be erected prior to harvesting, and harvest boundaries will be clearly marked before operations begin.		
MM12	Felling Drainage Management	EIAR Chapter 4 CEMP Section 3	Prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed: › All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps. › Clean water diversion drains will be installed upgradient of the works areas. › Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains. › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
MM13	Felling License	EIAR Chapter 4 CEMP Section 2	› Felling will be carried out under the terms of a licence application to the Forest Service, as per the Forest Service's policy on granting felling licenses for wind farm developments. › The Forest Service's policy on granting felling licenses for wind farm developments requires that a copy of the planning permission for the Proposed Project be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Project.		
MM14	Traffic Management	EIAR Chapter 4, 15	› A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out within the CEMP along with Chapter 15 of the EIAR, will be finalised and detailed		

		CEMP Section 3	provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on-site. › Prior to the Traffic Management Plan being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the Traffic Management Plan for agreement with the relevant Authorities. › Where the Proposed Grid Connection is located on public roads, a Traffic Management Plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services
MM15	Peat & Spoil Management	EIAR Chapter 4, 9 Appendix 4-2 CEMP Section 2	› An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. › Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level. › All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction.
MM16	Proposed Grid Connection underground cabling works	EIAR Chapter 4 CEMP Section 2	› Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified. All relevant bodies i.e., ESBN, Galway County Council, GNI etc. will be contacted and all up to date information for all existing services sought.
MM17	Waste Management	EIAR Chapter 4 CEMP Section 3	› Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the Waste Management Plan (WMP), ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.

Construction Phase					
MM18	Refuelling	EIAR Chapter 4, 8, 9 Appendix 4-3 CEMP Section 3	› Road-going vehicles will be refuelled off-site wherever possible. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. › All refuelling will be carried out outside designated watercourse buffer zones. › Only designated trained and competent operatives will be authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. The following mitigation measures are proposed to avoid release of hydrocarbons at the Site: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck, that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use › Only designated trained operatives will be authorised to refuel plant on-site; › Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones; › Fuels stored on the Proposed Wind Farm site will be minimised;		

			› Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (CEMP) (Appendix 4-5). Spill kits will be available to deal with accidental spillages.		
MM19	Concrete Based Products Deliveries and Management	EIAR Chapter 4, 9 CEMP Section 3	› No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; › Where possible pre-cast elements for culverts and concrete works will be used; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, › At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs		
MM20	Concrete Pouring	EIAR Chapter 4 Appendix 4-3	› Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. › Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete. › Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. › Ensuring that covers are available, and used, when necessary, for freshly placed concrete to avoid the surface washing away in heavy rain. › The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent.		

			› Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats. › Concrete pours will be managed and supervised to ensure there will be no leakage/ seepage/ discharge of concrete or concrete water during the construction phase. › Concrete wash water, and waste concrete will be managed appropriately on site at a lined concrete wash out pit.		
MM21	Road Cleanliness	EIAR Chapter 4 CEMP Section 3	› The Proposed Wind Farm roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. › A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project. › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.		
MM22	Watercourse Buffers	EIAR Chapter 4 Appendix 4-3 CEMP Section 3	› There will be no direct discharges to natural watercourses or drains. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from watercourses. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings. › Buffered outfalls, which will be numerous over the Proposed Wind Farm site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site.		
MM23	Water Discharge	Appendix 4-3 CEMP Section 3	› Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm Site drainage into the existing site drainage network where possible. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion. › Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;		

MM24	Wastewater Management	EIAR Chapter 4, 9	› The temporary construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank. The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor.		
MM25	Drainage Swales	EIAR Chapter 4	› Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses. › Drainage swales will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike.		
MM26	Interceptor Drains	EIAR Chapter 4 Appendix 4-3 CEMP Section 3	› Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the Site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. › The interceptor drains will be installed in advance of any main construction works commencing.		
MM27	Check Dams	EIAR Chapter 4 Appendix 4-3	› The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive.		

MM28	Level Spreaders	EIAR Chapter 4 Appendix 4-3	› A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain, into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the Site.		
MM29	Piped Slope Drains	EIAR Chapter 4 Appendix 4-3	› Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders.		
MM30	Vegetation Filters	EIAR Chapter 4 Appendix 4-3	› Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions.		
MM31	Stilling Ponds (Settlement Ponds)	EIAR Chapter 4, 9. Appendix 4-3 CEMP Section 3	› Stilling ponds will be used to attenuate runoff from works areas of the Proposed Project during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Project during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.		
MM32	Silt Bags	EIAR Chapter 4, 9	› Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site.		

		Appendix 4-3	› Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of silt into the stream.		
MM33	Siltbuster	EIAR Chapter 4, 9 Appendix 4-3 CEMP Section 3	› Siltbusters or similar equivalent pieces of equipment will be available to filter any water pumped out of excavation areas if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. They are specifically designed for use on construction sites. › The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint onsite and making it highly mobile. › They will be used as final line of defence if needed.		
MM34	Culvert Crossings	EIAR Chapter 4, 9. CEMP Section 2	It is proposed to construct a clear-span watercourse crossing at the 2 no. locations where new watercourse crossings are required within the Proposed Wind Farm site. The locations of these crossings are shown on the layout drawings included in Appendix 4-1 and Figure 4-31 in Chapter 4. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows: › The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing. › All drainage measures along the proposed road will be installed in advance of the works.		

			› A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required. › Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse. › Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse. › Where the box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse, › Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations. › Underground cabling ducting will be contained within the road make-up of the proposed crossing.		
MM35	Clear-Span Watercourse Crossing	EIAR Chapter 4, 9. CEMP Section 2	› All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900m diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert. › Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces, which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.		

			› All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
MM36	Silt Fences	EIAR Chapter 4 Appendix 4-3 CEMP Section 2	› Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50m buffer zone of a stream, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Project. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3. › Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document '*Control of Water Pollution from Linear Construction Projects'* published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. › All silt fencing will be formed using Terrastop Premium or equivalent silt fence product. › Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.		
MM37	Sedimats	EIAR Chapter 4 Appendix 4-3	› Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.		
MM38	Hydrocarbon Interceptor	EIAR Chapter 4	› A hydrocarbon (or petrol) interceptor is a trap used to filter out hydrocarbons from surface water runoff. A suitably sized hydrocarbon interceptor will be installed wherever it is intended to store hydrocarbons and oils (i.e., construction compounds and substation compound) or where it is proposed to park vehicles during the construction and operational phases of the Proposed Project (i.e., construction compounds and substation compound).		

MM39	Proposed Grid Connection – existing services, joint bays and watercourse crossings	EIAR Chapter 4 CEMP Section 2	› Any underground services encountered along the Proposed Grid Connection will be surveyed for level and the ducting will pass over the service provided adequate cover is available. › A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. › If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the Proposed Grid Connection ducting and bottom of the service will be achieved. › In deeper excavations an additional layer of marker tape will be installed between the communications duct and top-level yellow marker tape. › If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle where appropriate. › Where the Proposed Grid Connection underground cabling route interacts with existing underground services (i.e., the GNI network at 2 no. locations, M17 Motorway at 1 no. location, and the Irish Rail Galway-Dublin rail line at 1 no. location), the service crossings will be constructed in accordance with the relevant guidelines and best practice information from the relevant entity, i.e., GNI, Irish Rail, Transport Infrastructure Ireland. › The Applicant will hold consultation with the relevant entities prior to the commencement of works along the Proposed Grid Connection. › During construction the joint bay locations will be completely fenced off once they have been constructed, they will be backfilled until cables are being installed. › The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to approval by ESBN. › The watercourse crossing methodologies, for the provision of the Proposed Grid Connection underground cabling route of the Proposed Project, is set out [in Section 4.8.2.8 of Chapter 4] with the most appropriated option being selected for each crossing location. Instream works are not required at any watercourse crossing along the Proposed Grid Connection.		

			› The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility. › Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits.		
MM40	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 Appendix 4-3 CEMP Section 2	› The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter. › Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished turbine. › No material will be removed from the Proposed Wind Farm site with excavated peat and spoil being transported and stored in the identified peat and spoil management areas within the Site. › All groundwater and surface water arising from turbine base excavation will be pumped to the dirty water system prior to discharge from the works area. › Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light. › The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the turbine/met mast foundation. › Where (temporary) deep excavations are proposed, cut-off drains will be used to reduce the amount of surface water entering the excavation. This will be the case around turbine base excavations.		

MM41	Peat and Spoil Management	EIAR Chapter 4, 9 Appendix 4-2 CEMP Section 2	› Excavated peat will be placed/spread across the designated areas within the Proposed Wind Farm site. › The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat will be placed in the centre of the peat management areas with firmer spoil /drier peat placed around the outside. › The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works. › It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat. › Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. › The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the peat and spoil management areas. › Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site. › Supervision by the Project Geotechnical Engineer will be carried out for the works. › An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.		
MM42	Temporary Construction Compound	EIAR Chapter 4 CEMP Section 2	› Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. › There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank.		

			› The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter; › The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor. › The compound will be fenced and secured with locked gates if necessary.		
Operational Phase					
MM43	Wastewater Management	EIAR Chapter 4	› The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. › The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Project turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the substation underground storage tank.		
MM44	Electrical Substation	EIAR Chapter 4 CEMP Section 2	› The area of the on-site substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to one of the designated peat and spoil management areas. › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. › Perimeter fencing will be erected.		
Decommissioning Phase					
MM45	Decommissioning	EIAR Chapter 4	› Prior to the end of the operational period the Decommissioning Plan (Appendix 4-6 of the EIAR) will be updated in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time.		

		Decommissioning Plan			
MM46	Decommissioning	EIAR Chapter 4 Decommissioning Plan Section 2	› Upon decommissioning of the Proposed Wind Farm, the wind turbines and the meteorological mast will be disassembled in reverse order to how they were erected. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate. › The underground electrical cabling connecting the proposed turbines to the proposed onsite 38kV substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility. › The Proposed Grid Connection and onsite 38kV electricity substation will remain in place as it will be part of the Electricity Grid under the ownership and control of the ESB Networks.		
MM47	Refuelling	EIAR Chapter 4, 8, 9	› Road-going vehicles will be refuelled off-site wherever possible. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. › All refuelling will be carried out outside designated watercourse buffer zones.		

			› Only designated trained and competent operatives will be authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. The following mitigation measures are proposed to avoid release of hydrocarbons at the Site: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery will be refuelled on-site by a fuel truck, that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use › Only designated trained operatives will be authorised to refuel plant on-site; › Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones; › Fuels stored on the Proposed Wind Farm site will be minimised; › Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-5). Spill kits will be available to deal with accidental spillages.		
EIAR Chapter 5: Population and Human Health					
Pre-construction Phase					

MM48	Human Health	EIAR Chapter 5	› Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
MM49	Traffic and Transport	EIAR Chapter 5	› Prior to commencing Proposed Grid Connection works in the local road network in the townland of Barrettspark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. › Prior to commencement of any Proposed Grid Connection works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. ○ Local access to properties will be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum › It is not anticipated that any section of the public road network will be closed during transport of turbines, although there will be some delays to local traffic at pinch points. During these periods it may be necessary to operate local diversions for through traffic. All deliveries comprising abnormally large loads where required will be made outside the normal peak traffic periods, usually at night, to avoid disruption to work and school-related traffic.		
Construction Phase					
MM50	Human Health	EIAR Chapter 5 CEMP Section 5	The Proposed Project will be constructed in accordance with all relevant Health and Safety Legislation, including: › Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); › Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016);		

			› S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and › Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006). The following mitigation measures are detailed below: › A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage. › All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted. › Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Project. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running over the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Site will be made aware of the location of overhead electricity lines before they come on to Site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g., component delivery, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or		

			equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on Site. › The construction of the Proposed Grid Connection underground cabling will be in phases along the proposed route. Prior to commencing grid connection works in the local road network in the townland of Barrettspark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. › All staff will be made aware of and adhere to the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'*. This will encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan. The scale and scope of the project necessitates that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'*. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; › Where possible, eliminate the hazards or reduce the risks; › Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; › Ensure that the work of designers is coordinated to ensure safety; › Organise co-operation between designers; › Prepare a written Safety and Health Plan;		

			› Prepare a safety file for the completed structure and give it to the client; and › Notify the Authority and the client of non-compliance with any written directions issued. The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Development of the Safety and Health Plan for the construction stage, with updating where required as work progresses; › Compile and develop safety file information. › Reporting of accidents / incidents; › Weekly Site meeting with PSCS; › Coordinate arrangements for checking the implementation of safe working procedures. › Ensure that the following are being carried out: ○ Induction of all Site staff including any new staff enlisted for the project from time to time; ○ Toolbox talks as necessary; ○ Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ○ Report on Site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ○ Monitor the compliance of contractors and others and take corrective action where necessary; and ○ Notify the Authority and the client of non-compliance with any written directions issued.		
MM51	Air Quality: Dust Emissions	EIAR Chapter 5, 10 CEMP Section 3	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site.		

			› Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Site on specified haul routes only. › The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary. › The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Approximately 5 dust monitoring gauges will be deployed across the Proposed Wind Farm site to detect any exceedances of acceptable dust levels. › Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movement. › A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures.		
MM52	Air Quality: Exhaust Emissions	EIAR Chapter 5, 10	› Proposed Project Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use.		

			› Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All plant and materials vehicles shall be stored in dedicated areas (onsite). › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be sourced from local quarries. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).		
MM53	Noise and Vibration	Chapter 5, 12	› No plant used on site will be permitted to cause an on-going public nuisance due to noise. › The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. › Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate.		

			▸ During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 12-1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* ▸ The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours.		
Operational Phase					
MM54	Property Values	EIAR Chapter 5	▸ The Proposed Wind Farm has been designed in accordance with the parameters set out in the Guidelines (DoEHLG, 2006) and with cognisance of the Draft Guidelines (DoHPLG, 2019).		
MM55	Human Health	EIAR Chapter 5	▸ Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. ▸ Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. ▸ Signs will also be erected at suitable locations across the Site as required for the ease and safety of operation of the wind farm. These signs include: ○ Buried cable route markers at 50m (maximum) intervals and change of cable route direction; ○ Directions to relevant turbines at junctions; ○ "No access to Unauthorised Personnel" at appropriate locations; ○ Speed limits signs at Site entrance and junctions; ○ "Warning these Premises are alarmed" at appropriate locations; ○ "Danger HV" at appropriate locations; ○ "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at Site entrance;		

			○ "No unauthorised vehicles beyond this point" at specific Site entrances; and ○ Other operational signage required as per Site-specific hazards. › The proposed onsite 38kV substation, which will be operated by ESBN will be locked and fenced off from public access. The substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. › Periodic service and maintenance work which include some vehicle movement. › For operational and inspection purposes, substation access is required. › Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: ○ Six-month service – three-week visit ○ Annual service – six-week visit ○ Weekly and daily visits as required. › An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the Site. Access for emergency services will be available at all times.		
MM56	Shadow Flicker	EIAR Chapter 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the 82 no. sensitive receptors identified above, a site visit will be undertaken firstly to determine the presence of existing screening and window orientation at each potentially affected property. This will determine if the receptor has an actual line of sight to any turbine and actual potential for shadow flicker to occur. Once this exercise is completed and all of the potentially affected properties, the following measures will be employed. <u>Screening Measures</u> In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation;		

			➢ Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator. <u>Wind Turbine Control Measures</u> If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed above, wind turbine control measures will be implemented. Wind turbines can be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the wind farm. The shadow flicker control units will be added to any required turbines. A shadow flicker control unit allows a wind turbine to be programmed and controlled using the wind farm's Supervisory Control and Data Acquisition (SCADA) system to change a particular turbine's operating mode during certain conditions or times or even turn the turbine off if necessary.		
Decommissioning Phase					
MM57	Decommissioning Phase	EIAR Chapter 4, 5 Decommissioning Plan Section 2	The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Proposed Project may be decommissioned fully. The Proposed Grid Connection and on-site substation will remain in place as it will form part of the national electricity grid under the control of ESBN. The works required during the decommissioning phase are described in Section 4.11 in Chapter 4: Description of the Proposed Project. Any effect and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction		

			phase, however to a lesser extent, and the mitigation measures outlined above will be implemented during the decommissioning phase also. A Decommissioning Plan has been prepared as part of this EIAR and is included as Appendix 4-6.		
EIAR Chapter 6 Biodiversity					
Pre-construction					
MM58	Invasive Species Management	EIAR Chapter 6 CEMP Section 3	A baseline invasive species survey was carried out at the Site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist. As outlined in Chapter 6 of the EIAR, one record of *Rhododendron ponticum* was found within wet grassland within the east of the EIAR site boundary at ITM 562076 729531, however this is completely avoided by the Proposed Project. In the event that the presence of such species is found at or adjacent to the Proposed Project development footprint during pre-commencement surveys, particularly in areas where its excavation may be required, an Invasive Species Management Plan will be prepared for the Site to prevent the introduction or spread of any invasive species within the footprint of the works. An Invasive Species Management Plan, if required, will set out best practice control methods as summarised in the following sections. The Invasive Species Management Plan would be updated during construction.		
MM59	Fauna	EIAR Chapter 6	**Marsh Fritillary:** Construction works will occur in close proximity to identified marsh fritillary-populations at T01, T03, T05 and T08 and along the proposed new road to T02. In addition, scrub clearance within the proposed bat buffer for Turbines T05 and T08 will be required in proximity to existing confirmed breeding sites. The following mitigations will be applied at these construction locations:		

			› A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year in advance of construction throughout footprint areas of the Proposed Wind Farm › If active larval webs are recorded within the construction footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the construction footprint. This will be achieved by translocating a sod of earth with entire, intact devils' bit scabious plants upon which the larvae are feeding. › Larval webs and associated food plants would only be translocated by the ECoW to existing breeding areas as shown in Appendix 6-5. › Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres near T01, T03, T05 and T08. › ECoW supervision will be required for construction of components near existing breeding areas (such as Turbines T01, T03, T05, T08 and along the proposed new road to T02). › Where suitable marsh fritillary habitat occurs in close proximity to Proposed Wind Farm infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. › No clearance of scrub within the proposed bat buffer of Turbines T05 or T08 will be carried out until sufficient exclusion zone fencing to a minimum of 5m is in place, or unless under ECoW supervision. The following mitigation applies to construction areas within 20m of recorded marsh fritillary larval webs (in line with Table 4 of Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction 2024): › Groundworks (i.e works with potential to create dust) associated with proposed Turbines T01, T03, T05 and T08 and along the proposed new road to T02 will be fully supervised by an ECoW. › The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with the mitigations set out in Section 6.5.2.1.2 of the EIAR.		

			› If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work. › The ECoW will have power to halt construction works if required as outlined above. › All of the additional dust mitigation measures outlined in Section 6.5.2.1.2 of the EIAR will apply. **Otter:** › A pre-commencement survey for otter will be undertaken along the Raford River and its tributary (the Killimor/ Attymon Beg River) within 150m upstream and downstream of the proposed new crossing structures in advance of commencement of works in order to confirm whether the baseline survey conditions remain the same. › If a holt is found within 150m of construction areas, the works will be undertaken in line with NRA guidelines and if a potential for disturbance is identified, these works will not be undertaken until a derogation licence is obtained. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of the survey will be to assess any changes in baseline conditions since the time of undertaking the baseline surveys. › The proposed 2 no water crossing structures will be pre-cast, clear-span structures and will therefore avoid any loss of riverbed or riverbank habitat). **Badger:** › Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out in order to assess activity levels at setts and to identify any additional sett entrances that may have been established in the intervening period. › All setts within 50m of the Proposed Wind Farm infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. › All badger survey work will be undertaken in line with current best practice guidance.		

			Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Wind Farm: › Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. › Construction works associated with the access road to Turbine T03 will be carried out over 30m away from the sett and the 30m exclusion zone will be fenced off to exclude potential access by construction workers. › Construction works associated with the access road to proposed Turbine T03 which is <50m from the sett will be undertaken outside of badger breeding season (January to June inclusive) if possible, unless in consultation with the NPWS with agreed additional mitigation in place. › All of the above works will be undertaken or supervised by an appropriately qualified ecologist in advance of construction. **Red Squirrel and Pine Marten:** Prior to the commencement of construction works, the following measures will be undertaken for the avoidance of disturbance and to ensure no dreys or dens have been established since the original surveys undertaken. The following measures are in line with *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA 2009). › From a precautionary basis, a pre-commencement survey will be undertaken by a qualified ecologist in accordance with standard best practice guidance prior to the commencement of site works to ensure that no red squirrel dreys or pine marten dens are present within or in close proximity to Proposed Project infrastructure footprint. › In the event that a red squirrel drey or pine marten den is identified within the Proposed Project footprint during pre-commencement surveys, further surveys will be undertaken to		

			ascertain whether the drey/den is in use. A Species Protection Plan as agreed by the project ecologist will be put in place in advance of felling works.		
Construction Phase					
MM60	Surface Watercourses and Sensitive Aquatic Faunal Species	EIAR Chapter 4, 6, 9	A drainage design for the Proposed Project is provided in Section 4.6 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Project, in particular the Proposed Grid Connection. In addition to this, specific mitigation is provided in relation to protection of surface water quality is provided in Chapter 9: 'Water' of this EIAR, see Section 9.5. These mitigations relate to earthworks, tree felling, potential release of hydrocarbons during construction and storage, contamination from wastewater disposal, groundwater impacts, flooding impacts, potential impacts during horizontal directional drilling, and release of cement-based products.		
MM61	Bats	EIAR Chapter 6 Appendix 6-2 Appendix 6-4	The below describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations. <u>Noise Restriction</u> During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended). <u>Lighting Restriction</u> Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Wind Farm Site, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Site to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.		

			The proposed lighting around the Proposed Wind Farm site shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023). In addition, the Applicant commits to using lighting during construction, operation, and decommissioning only where necessary, in line with the updated Dark Sky Ireland Lighting Principles: › All lighting will be justified and used only when required. › Warm colour temperatures will be used to minimise impacts on wildlife and the night sky. › Glare and brightness will be minimised to protect visual comfort. › Luminaires will be angled downward with appropriate beam control to avoid over-lighting. › Lower mounting heights will be used where possible to better contain light. › Lighting will incorporate timers, dimmers, or PIR sensors to reduce energy use and emissions. › Natural areas such as trees, waterbodies, and nesting habitats will not be illuminated. <u>Biodiversity Management and Enhancement Plan (BMEP)</u> The proposed planting of approximately 3,521 m of new native hedgerow will result in a net gain of approximately 1,555m of linear habitat within the Proposed Wind Farm site. This represents more than a 100% increase in linear landscape features compared to those lost. These new habitats have been strategically designed to link isolated linear features with areas of greater connectivity and will enhance both foraging and commuting opportunities for local bat populations. Further details are provided in Appendix 6-4 Biodiversity Management Enhancement Plan (BMEP).		
MM62	Habitats	EIAR Chapter 6, 10	**<u>Annex 1 Raised Bog Habitats</u>** **Mitigation by Design**		

		Appendix 6-4	The Proposed Wind Farm has been specifically designed to avoid Article 17 mapped and unmapped Annex I areas of peatland habitat where possible and to minimise impacts thereon. This was achieved through an early-stage ecological constraints study informed by field surveys and habitat mapping. The Proposed Wind Farm layout was thereby altered through the iterative design process to avoid important peatland habitats. **Dust Mitigation** A range of construction phase mitigation measures to prevent dust impacts have been described as set out in Section 10.3.2.3 of Chapter 10 'Air Quality'. These include the following: › Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site. › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Proposed Wind Farm on specified haul routes only. › The agreed haul route road adjacent to the Proposed Wind Farm will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm proposed new entrance will be checked weekly for damage/potholes and repaired as necessary. › The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas.		

			› Dust monitoring gauges will be deployed across the Proposed Wind Farm to detect any exceedances of acceptable dust levels. Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movement. **Cutover Bog (PB4) and Associated Habitats** **Specific Mitigation** The loss of 4ha of cutover peatland for the Proposed Project will be offset through the BMEP which includes for the re-wetting of a cutover bog area measuring 5.3ha. This area comprises degraded and drained marginal peatland habitat. It is intended that excavated peat from the construction works will be used to block drains and/or create bunded wetland cells within this area. The mapped drains in this area are shown in Figure 3-2 of the BMEP. It is anticipated that the slowing down of water flows from this area will in turn enhance the adjacent Article 17 mapped raised bog area. A Monitoring Plan to ensure success of the proposed measures are also provided in the BMEP. Excavated material used within the area for this purpose will comprise strictly peat soils. In addition, the area for peat management proposed adjacent to Turbine T03 will be used as part of biodiversity proposals within the BMEP. It is proposed that the area is plug-planted with devil's bit-scabious for the benefit of marsh fritillary and will comprise strictly peat soils to encourage re-colonisation with peatland plant communities. The area proposed for peat/spoil management adjacent to proposed turbine T02 will be allowed to naturally revegetate. **Dust Mitigation** The dust mitigations outlined above will be applied.		

			Wet Heath/Wet Grassland (HH3/GS4) Mosaic and Transitional Wet Grassland-Marsh (GS4-GM1) **Construction Mitigation** Direct Habitat Impacts: › Construction works associated with the proposed turbine T08, including site set up, will be undertaken with supervision by an appropriately qualified and experienced ECoW. › The construction works area for proposed turbine T08 and associated site access routes will be fully fenced off (with solid hoarding where possible) to ensure there is no access or egress to adjacent areas of sensitive habitat. **Dust Mitigation** The dust mitigations outlined above will be applied. **Woodland Habitats and Scrub** The loss of woodland and scrub for the Proposed Project will be offset through the planting of native woodland as part of the BMEP (Appendix 6-4). In total, it is proposed to plant 1.9ha of native woodland. The proposed native woodland replanting areas are shown in Figure 3-1 of the BMEP. These have been strategically chosen to link up with identified bat commuting corridors within the Proposed Wind Farm site and will provide enhanced habitat forging area relative to the commercial conifer stands. The proposed planting will comprise native tree species of various age structures and will be of greater biodiversity value than the habitats being lost.		

			The BMEP and associated planting proposals will be implemented within planting season during or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat. **Treeline (WL2) and Hedgerow (WL1)** Approximately 3,521m linear metres of new hedgerow planting will be carried out along selected boundaries of fields within the Proposed Wind Farm site. The replanting areas are presented in Figure 3-1 of the BMEP (Appendix 6-4). These have been strategically chosen to link up with identified bat commuting corridors in the Proposed Wind Farm site. This will result in more than a 100% net gain in this habitat within the Proposed Wind Farm site. Species planted in these locations will be of a similar composition to those occurring on site and will be of local provenance where possible. Further details with regard to species, planting location, and management is contained within the BMEP. The BMEP and associated planting proposals will be implemented within planting season during or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat.		
MM63	Invasive Species	EIAR Chapter 6 CEMP Section 3	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works: › A risk assessment and method statement will be provided by the Contractor prior to commencing works. › Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected. › A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface. › Stockpile areas will be chosen to minimise movement of contaminated soil. › Stockpiles will be marked and isolated.		

			› Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore. › The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material. › An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans. Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following: › Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it. › Decontamination will only occur within designated wash-down areas. › Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches. › All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.		
Operational Phase					
MM64	Surface Watercourses	EIAR Chapter 4, 6 Appendix 4-3 CEMP Section 3	**Mitigation by design:** <u>Proposed Wind Farm site</u> The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the Drainage drawings submitted with this planning application (Appendix 4-3): › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where		

			suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds have been designed in consideration of the greenfield runoff rate. › The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; <u>Proposed Grid Connection</u> The trench associated with the Proposed Grid Connection will be backfilled and reinstated following the laying of the cables. As such, the permeability of the ground will remain unchanged. Mitigation measures for sediment control are the same as those detailed above for the construction phase. With regards to hydrocarbons: › Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the Proposed Project. These vehicles will be refuelled offsite;		

			› Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked; › Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillages.		
MM65	Bats	EIAR Chapter 6 Appendix 6-2	While High median activity was recorded at three locations, it is noted that habitats at these locations will change during the construction phase of the Proposed Project with the required implementation of the bat felling buffers. A monitoring and mitigation strategy has been devised for the Proposed Project, in line with the case study example provided in Appendix 5 of the NatureScot 2021 Guidance and based on the site-specific data. After year 1 monitoring, if a curtailment requirement is identified, a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers if deemed necessary. **Bat Vegetation buffer** › In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) should be applied to the siting of all wind turbines. However, Eurobats No. 6 guidance and NIEA recommends increased buffers of 100m and 200m around woodland/forestry areas, however, there is no scientific evidence to support these increased buffer distances in the UK. › NatureScot recommends that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features) is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post-construction monitoring. The success of the buffer mitigation will be assessed as part of post construction monitoring and updated where necessary. The formula provided in Section 6.1.3 of the Bat Report (Appendix 6-2) is presented to provide appropriate mitigation in relation to bats, and the relevant input required from turbine parameters, is the combination of the blade length		

			and hub height. The proposed turbines to be installed on the Proposed Wind Farm site will have a maximum ground-to-blade tip height of 185m, rotor diameter of 163m, and hub height of 104m. › There will be a requirement to remove linear vegetation i.e. treelines/hedgerows, to facilitate the required bat buffers at the Proposed Wind Farm site. These vegetation-free areas will be maintained during the operational life of the Proposed Project. **Blade feathering** › NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). › In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine. **Operational monitoring** › To assess the effects of the Proposed Wind Farm site on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. › The results of post-construction monitoring shall be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. At the end of Year 1, and if a curtailment requirement is identified (i.e. significant bat fatalities encountered), a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers. › At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Site, post		

			construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties. › Section 6.2.1 of the Bat Report (Appendix 6-2) provides detail with regard to the monitoring to be carried out in years 1, 2 and 3 and includes bat activity surveys and carcass searches. **Lighting** › With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.		
MM66	Marsh Fritillary Habitat	Appendix 6-4	During operation of the Proposed Wind Farm, it is proposed that existing areas of breeding marsh fritillary habitat are safeguarded. This includes the main breeding areas identified within the east of the Proposed Wind Farm site in Blocks L and K (Figure 3-1 of the BMEP). It has been agreed that these areas will be protected from development, land clearance or use conversion, or significant agricultural works for at least the duration of this Plan. The grasslands will be included as part of the Monitoring Plan for the Proposed Project (Section 3.3 of the BMEP) and will be subject to the below listed low-intensity management measures. During the course of the Monitoring Plan throughout the operation of the Proposed Wind Farm, the Project Ecologist may prescribe alternative management measures for these areas in order to maintain or increase their value for marsh fritillary: › Sheep grazing is unsuitable as they will graze selectively for flowers. Grazing only by cattle.		

			› Use of supplementary feeding within Blocks L and K is prohibited. › If grazing the fields, a stocking level of no more than 0.5LU/ha will be applied. However, the stocking rate is to be subject to monitoring and altered as required. The goal is to have a structured sward between 12 and 25cm in height. › Avoid mowing as this removes variations in sward height. › No fertiliser, slurry, herbicide, pesticide usage › Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less subject to disturbance, and outside of bird nesting season › Maintain shelter on western, south-western and north-western sides of fields where possible.		
Decommissioning Phase					
MM67	Decommissioning Phase	EIAR Chapter 6	The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Project to result in significant effects on biodiversity.		
EIAR Chapter 7 Birds					
Pre-Construction Phase					
MM68	Birds (Pre-Construction Surveys)	EIAR Chapter 7	› Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Wind Farm site to identify any sensitive sites (e.g. nests or roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts, depending on the season in question.		

			› The survey will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. › All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked to alert all personnel onsite to the suspension of works within that area.		
MM69	Design of the Proposed Project	EIAR Chapter 7	The project design has followed the basic principles outlined below to avoid the potential for significant effects on avian receptors: › The Proposed Project avoids wildlife refuge sites (e.g., waterbodies) › Hard standing areas have been designed to the minimum size necessary to accommodate the proposed turbines, however it should be noted that the assessment of the hardstand footprint, within this EIAR, is based on the maximum potential footprint for a Proposed Wind Farm infrastructure (including the proposed turbines hardstands) under a precautionary scenario as outlined in Section 4.3.1.1.5 of Chapter 4. › The turbine delivery route has been selected to utilise built infrastructure i.e., public roads. › The Proposed Grid Connection has been selected to utilise built infrastructure for the majority of its length (i.e. cables to be laid within public roads and existing private roads/tracks). Cabling will be laid underground as a result and will avoid effects on roadside hedgerows and disturbance to nesting birds.		
Construction Phase					

MM70	Birds (Construction Phase)	EIAR Chapter 4, 6, 7, 9, 12 CEMP Section 3	A Construction and Environmental Management Plan (CEMP) has been prepared and will be in place prior to the start of the construction phase. The CEMP is included as Appendix 4-5 of this EIAR and details pertinent to birds are summarised below. Note that these measures are proposed as industry best practice rather than to mitigate any identified significant effect and will be updated as required to address any conditions of a grant of permission or findings of any pre-construction survey results. › Works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible. Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. › Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, all work will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022 and areas will be replaced with suitable hedge/tree species which are common in the local context. › A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is Appendix 6-4 to this EIAR. › During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. Please see Chapter 12: Noise and Vibration for more detail associated with noise during the construction phase. › Water protection measures will be implemented around existing watercourses as outlined in Chapter 9 of this EIAR, to protect the use of watercourses by birds. › If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		

			➢ An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: ○ Organise the undertaking of pre-construction and construction phase walkover bird surveys to ensure that significant effects on birds will be avoided. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Wind Farm site. ○ Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise. ○ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. ○ Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary.		
Operational Phase					
MM71	Birds (Operational Phase Surveys)	EIAR Chapter 7	No significant operational phase impacts requiring mitigation were identified. Operational Bird Monitoring is detailed below in Table 18-2.		
Decommissioning Phase					
MM72	Decommissioning	EIAR Chapter 7	During the decommissioning phase, disturbance limitation measures will be as per the construction phase described in Section MM70.		
EIAR Chapter 8 Land, Soils & Geology					
Construction Phase					
MM73	Peat and Spoil Excavation	EIAR Chapter 4, 8	Proposed Wind Farm site		

		Appendix 4-2	› Placement of turbines and associated infrastructure in areas with suitable ground conditions where appropriate (based on detailed site investigation data – the areas of deeper peat have been generally avoided by the Proposed Wind Farm infrastructure); › The peat/soils and subsoils which will be removed during the construction of turbine hardstands will be localised to the turbine locations. The peat/soil/subsoil will be placed/spread locally alongside the excavations or stored within the 5 no. designated peat and spoil management areas; › Excavated peat/soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › At the identified peat and spoil management areas, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated; › The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.5m. Weak/liquified peat will be stored in the centre of › the peat management areas with firmer/drier peat placed around the outside; › The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works; › It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat; › Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. › Where available, the acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the peat and spoil management areas; › Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site; › Supervision by the Project Geotechnical Engineer will be carried out for the works; and,		

			› An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off. (interceptor drains will not be required at all areas as the existing drainage network can function as interceptor drains – silt fences will be installed upgradient of the peat and spoil management areas in these locations). <u>Proposed Grid Connection</u>: › Any overburden excavated from the cable trench will either be managed in the identified peat and spoil management areas within the Proposed Wind Farm or sent to an appropriately licensed facility; › Some excess spoil material or pavements materials containing tar generated during the cable route construction will be transported by permitted waste contractors to a suitable permitted/licensed site for disposal/recovery.		
MM74	Erosion of Exposed Peat, Soils and Subsoils During Construction	Chapter 8	› Soil/subsoil removed from the turbine locations and associated access roads will be used for landscaping, placed/spread locally alongside the excavation or will be stored in the designated peat and spoil management areas. › Temporary drainage systems will be required to limit runoff impacts during the construction phase. › In forestry areas, 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 all off-road routes, to protect the soil from compaction and rutting. › Soils/subsoils removed from the Proposed Grid Connection groundworks will be removed and either stored at the Proposed Wind Farm designated peat and spoil management areas or taken to an appropriately licenced facility.		
MM75	Contamination of Soil by Leakages	EIAR Chapter 4, 8	› Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Where possible, off-site refuelling will occur at a controlled fuelling station; › On-site refuelling will be undertaken using a double skinned bowser or a refuelling truck;		

	and Spillages of Hydrocarbons		› Only designated trained operatives will be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; › Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; › The on-site substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; › All waste tar material arising from works on hard top roads will be removed off-site and taken to licenced waste facility; and, › An emergency response plan for the construction phase to deal with accidental spillages is contained within the Construction and Environmental Management Plan (which is contained in Appendix 4.5).		
MM76	Erosion of Exposed Peat, Soils, and Subsoils During Tree Felling	EIAR Chapter 8	All proposed felling works will be completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and DAFM guidance documents to ensure that felling results in minimal potential negative effects on the local soil and subsoil environment. In addition, the following mitigation measures will be implemented during felling operations: › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; › All machinery will be operated by suitably qualified personnel;		

			› These machines will traverse the Proposed Wind Farm site along specified off-road routes (referred to as racks); › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; › As felling progresses, the harvester will collect brash produced by the felling and place it in front of the machine before it advances forward along the rack; › The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase; and, › The location of racks will be chosen to avoid wet and potentially sensitive areas.		
MM77	Peat Instability and Failure	EIAR Chapter 8 Appendix 8-1	The following control measures incorporated into the construction phase of the Proposed Project will ensure the management of the risks for this site: › Appointment of experienced and competent contractors; › The Proposed Wind Farm site will be supervised by experienced and qualified personnel; › Allocate sufficient time for the Proposed Project construction programme (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); › Prevent undercutting of slopes and unsupported excavations; › Maintain a managed robust drainage system; › Prevent placement of loads/overburden on marginal ground; › Implementation of safety buffers around deep peat areas as detailed in the GPSRA (FTC, 2025), Please refer to Appendix 8-1 for details on the safety buffers and stockpile restrictions. › Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and, › Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of the construction phase of the Proposed Wind Farm.		

MM78	Biodiversity Management Enhancement Plan (BMEP)	EIAR Chapter 6, 8 Appendix 6-4	All proposed habitat management and enhancement works will be in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte, DAFM and NatureScot guidance documents to ensure minimal potential negative effects on the local peat, soil and subsoil environment. Given the nature of the restoration measures the following mitigation measures are proposed: › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › Proposed off-road routes will be walked in advance of any machinery; › All machinery operators will be experienced; › The Proposed Wind Farm site will be walked before a machine goes off-road; › Bog mats will be used where the excavator is required to travel over wet ground; and, › A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.		
Operational Phase					
MM79	Site Road Maintenance	EIAR Chapter 8	› Use of aggregate from authorised quarries for use in road and hardstand maintenance.		
MM80	Site Vehicle/Plant Use	EIAR Chapter 4, 8 CEMP Section 6	› Vehicles used during the operational phase will be refuelled off site before entering the Site; › No fuels will be stored on-site during the operational phase; and › Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and, › An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be contained in the CEMP (Appendix 4-5).		
MM81	Use of Oil In Transformers	EIAR Chapter 4, 8	› All transformers and substation areas will be bunded to 110% of the volume of oil used in each transformer/substation; and,		

		CEMP Section 3, 6	› An emergency plan for the operational phase to deal with accidental spillages will be contained in the CEMP (Appendix 4-5).		
Decommissioning Phase					
MM82	Decommissioning Phase	EIAR Chapter 8	The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of reduced magnitude (i.e., soil/subsoil/bedrock excavation; Contamination by Leakage/Spillages). Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant (i.e., mitigation outlined at Sections 8.6.2 of the EIAR). Some of the effects will be avoided by leaving elements of the Proposed Project in place where appropriate, *i.e.* the 38kV substation and underground 38kV cabling. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
EIAR Chapter 9 Water					
Pre-Construction Phase					
MM83	Temporary Drainage Works	EIAR Chapter 4, 9 Appendix 4-3 CEMP Section 3	Prior to the commencement of construction works (new road/hardstand, turbine foundation installs or upgrade of existing roads) the following key temporary drainage measures will be installed: › All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; › Clean water interceptor drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		

Construction Phase					
MM84	Tree Felling	EIAR Chapter 9	**Mitigation by Avoidance:** There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "*Forestry and Water Quality Guidelines*" are shown in Table 9-12 of the EIAR. **Mitigation by Design:** Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows: › Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; › All machinery will be operated by suitably qualified personnel; › Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; › Machines will traverse the Site along specified off-road routes (referred to as racks); › The location of racks will be chosen to avoid wet and potentially sensitive areas; › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement		

			for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected spoil repository areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed onsite during construction; › Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; › Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; › Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites; › Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; › All refuelling will be completed outside of the designated 50m hydrological buffer zones. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, › Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. **Silt Traps**: Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner. **Timing of Proposed Project Felling Works:**		

			Felling will only be carried out during periods of no or low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. **Drain Inspection and Maintenance**: The following items will be carried out during pre-felling inspections and after: › Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions; › Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall; › Following tree felling all main drains will be inspected to ensure that they are functioning; › Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the Site, if impeded by silt or debris, will be unblocked; and, › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. **Surface Water Quality Monitoring**: Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).		

			Criteria for the selection of water sampling points include the following: › Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses; › Select sampling points upstream and downstream of the forestry activities; › It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; › Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, › The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.		
MM85	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	EIAR Chapter 4, 9 Appendix 4-2 Appendix 4-3 CEMP Section 3	<u>Mitigation by Avoidance</u> The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). The majority of the key Proposed Project areas are located significantly away from the delineated 50m watercourse buffer zones with the exception of T2, its associated hardstand and access roads, the upgrading of an existing watercourse crossing, new watercourse crossings, upgrades to existing site access tracks and new site access tracks. Additional control measures, which are outlined further in MM85, will be undertaken at these locations.		

			The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will: › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; › Avoid excavations within close proximity to surface watercourses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. <u>Mitigation by Design</u>: **Proposed Wind Farm site**: › Source controls: ○ Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. ○ Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas. › In-Line controls: ○ Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. › Treatment systems:		

			○ Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. It should be noted that for the Proposed Wind Farm site, an extensive network of forestry, peat and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls. The main elements of interaction with existing drains will be as follows: › Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm site drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion; › Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; › Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; › Buffered outfalls which will be numerous over the Proposed Wind Farm site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site; and, › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt		

			fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. **Proposed Grid Connection:** The majority of the Proposed Grid Connection is >50m from any nearby watercourse, sections within 50m of the Proposed Grid Connection are confined to existing watercourse crossings at bridges and culverts. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils. There is a total of 10 no. watercourse crossings (4 no. crossings over EPA mapped watercourses and additional crossings 6 no. over watercourses which are not included in the EPA database) along the Proposed Grid Connection. All the crossings are existing bridges and culverts along the public road. No in-stream works are required at any of these crossings, however due to the proximity of the streams to the construction work at the crossing locations, there is a potential for surface water quality impacts during trench excavation work. Mitigation measures are outlined below. A constraint/buffer zone will be maintained for all crossing locations where possible, whereby all watercourses will be fenced off. In addition, measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in		

			place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones. **Silt Bags:** Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. **Settlement Ponds:** The Proposed Wind Farm footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr or 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006). The supporting design calculations for all settlement ponds are included on Drawing D501 included in Appendix 4-3. **Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will		

			reduce the velocity of runoff prior to be released at the level spreader. In the absence of level spreaders, the potential for ground erosion is significantly greater than not using them. Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the Proposed Wind Farm site to provide a polishing filter for the Proposed Wind Farm drainage prior to reaching the downstream watercourses. Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls → check dams → silt traps → settlement ponds → level spreaders → silt fences → vegetation filters). **Water Treatment Train:** A final line of defence will be provided by a water treatment train such as a "Siltbuster". If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase. **Pre-emptive Site Drainage Management** The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.		

			The following forecasting systems are available and will be used on a daily basis at the Site to direct proposed construction activities: › General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; › Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests either of the following is likely to occur: › >10 mm/hr (i.e. high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. Prior to works being suspended the following control measures will be completed: › All active excavations will be secured and sealed off;		

			› Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and, › No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. **Management of Runoff from the Peat and Spoil Management Areas:** It is proposed that excavated peat and spoil will be placed in the designated peat and spoil management areas within the Proposed Wind Farm site. Peat excavated from T01, T02, T03 and T08 (72,490m^3) will be transported to the adjacent peat storage areas, used to create pressure berms on both sides of the floating roads or used for landscaping around the hardstands. Peat and spoil excavated from T04 to T08 (43,900m^3) will be transported to the peat/spoil storage areas at T04 and T05 or used as landscaping around the hardstands where no peat is present (T04 to T07). Shallow Peat/Topsoil removed from T04 to T08 will be temporarily stockpiled locally and used to cover the peat/spoil storage areas at T04 and T05, as well as any landscaping areas. Spoil excavated from the substation platform (2,500m^3) will either be landscaped around the platform or transported to the spoil storage areas at T04 and T05. A small volume of spoil (~350m^3 per turbine base) will be used as ballast backfill. The spoil management areas are located outside the 50m hydrological buffer zone. Proposed surface water quality protection measures regarding the peat and spoil management areas are as follows: › Where applicable the vegetative topsoil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.2 to 1.5 metres, following which the vegetative-top soils layer will be reinstated; › Where reinstatement is not possible, peat and spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff; › An interceptor drain will be installed upslope of the identified peat and spoil management areas to divert any surface water away from these areas where necessary;		

			› Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level; › Once the peat and spoil management area has been seeded and vegetation is established the risk to downstream surface water is significantly reduced. Therefore, at each stage of the peat and spoil management area development the above mitigation measures will be deployed to ensure protection of downstream water quality.		
MM86	Works Within the Hydrological Buffer Zones within the Proposed Wind Farm Site	EIAR Chapter 9	<u>Mitigation by Avoidance</u>: The Proposed Wind Farm layout has been designed to limit the amount of works within the delineated hydrological buffer zones associated with natural watercourses. Several consultations between HES, MKO and the project design team completed in the spring and summer of 2024 resulted in several design iterations which had the overall aim of reducing the volume of works within the buffer zones. It is worth noting that whilst T2 is located within the 50m buffer zone. An existing access track separates the proposed turbine location from the EPA mapped watercourse, which provides a natural barrier to prevent any runoff from the works are entering the watercourse at this location. <u>Mitigation by Design</u>: All mitigation measures detailed in MM84 will be implemented at these work locations. The following additional mitigation measures will also be implemented: › Double or triple silt fences will be placed downgradient of all work locations within the hydrological buffer zones; and, › All works will be completed during the dry weather periods and works will be postponed in the event of rainfall.		

MM87	Surface Water Quality from Excavation Dewatering	EIAR Chapter 9	Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; › If required, pumping of excavation inflows will prevent build-up of water in the excavation; › The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; › The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit; › There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; › Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; and, › A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.		
MM88	Hydrocarbons	EIAR Chapter 4, 9 CEMP Section 3	Mitigation measures proposed to avoid release of hydrocarbons are as follows: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site.		

			› Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis. › Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use › Only designated trained operatives will be authorised to refuel plant on-site; › Refuelling or maintenance of machinery will not occur within 100m of a watercourse; › Fuels stored on the Proposed Wind Farm site will be minimised; › Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-5). Spill kits will be available to deal with accidental spillages. › In relation to the Proposed Grid Connection, whilst no oils are around the cables, a lubricant will be used during cable pulling. The lubricant to be used is Techlude PHD which is a pourable, non-flammable, non-toxic and substantially biodegradable water-based product that does not pose a threat to the environment (Techlube PHD Technical Information Datasheet: https://www.socomore.com/en/waterbased-lubricant-techlube-phd-20l-p-bk1.html).		
MM89	Wastewater	EIAR Chapter 9	› During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds (and along the Proposed Grid Connection as required), maintained by the providing contractor, and removed from site on completion of the construction works; › Water supply for the site office and other sanitation will be brought to Site and removed after use from the Site to be discharged at a suitable off-site treatment location; and, › No water or wastewater will be sourced on the Site, nor discharged to the Site.		
MM90	Use of Cement Based Products	EIAR Chapter 4, 9	› No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; › Where possible pre-cast elements for culverts and concrete works will be used; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the		

		CEMP Section 3	construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, › At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.		
MM91	Morphological Changes to Surface Watercourses along the Proposed Grid Connection	EIAR Chapter 9	The vast majority of the Proposed Grid Connection is >50m from any nearby watercourse, sections within 50m of the route are confined to existing watercourse crossings at bridges. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils. Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed. The following mitigation measures are proposed for the grid connection crossing works: › No stockpiling of construction materials will take place along the grid route; › No refuelling of machinery or overnight parking of machinery is permitted in this area; › No concrete truck chute cleaning is permitted in this area; › Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; › Local road drainage, culverts and manholes will be temporarily blocked during the works; › Machinery deliveries will be arranged using existing structures along the public road; › All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur; › Any excess construction material will be immediately removed from the area and sent to a licenced waste facility; › Spill kits will be available in each item of plant required to complete the works; and, › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required.		

MM92	Morphological Changes to Surface Watercourses/ Drains within the Proposed Wind Farn site	EIAR Chapter 9	Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed: › The proposed new stream crossings at the Proposed Wind Farm site will be clear span watercourse crossings or bottomless box culverts. The construction methodology for these crossings have been designed to eliminate the requirement for instream work, and the existing banks will remain undisturbed. No in-stream excavation works are proposed at these locations and therefore there will be no direct impact on the stream at the proposed crossing locations. Abutments will be constructed from precast units combined with in-situ foundations; › All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI) is incorporated into the design of the proposed crossings; › All drainage measures will be installed in advance of the works; › Plant and equipment will not be permitted to track across the watercourse; › Once the foundations have been completed at both sides of the watercourse, the pre-cast concrete box culvert will be installed using a crane and there will be no contact with the watercourse; › Where the box culvert is installed in sections, the joint will be sealed to prevent granular material entering the watercourse; › As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "*Guidelines on protection of fisheries during construction works in and adjacent to waters*", i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); › Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase; and,		

			› All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.		
MM93	Piled Foundations	EIAR Chapter 9	The proposed mitigation measures designed for the protection of downstream surface water quality and groundwater quality within the peat bog will be implemented at all construction work areas. › Mitigation measures for sediment control are detailed in MM84. › Mitigation measures for the control of hydrocarbons during construction works are detailed in MM87. › Mitigation measures for the control of cement-based products during construction works are detailed in MM89. Proposed mitigation measures relative to piling works will comprise: › Strict QA/QC procedures for piling works will be followed; › Piles will be kept vertical during piling works; › Good workmanship will be employed during all piling works; and › Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater.		
MM94	Siltbuster	EIAR Chapter 9	Measures employed to prevent overdosing and potential chemical carryover: › The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur; › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; › Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment;		

			› Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and, › Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs).		
MM95	Surface Water Quality Due to Fluvial Flooding During Construction	EIAR Chapter 9 CEMP Section 3	The Project EM (Environmental Manager) or the site ECoW will be responsible for monitoring weather forecasts during the construction phase. There will be a 24-hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Eireann), planned responses will be undertaken. › Cessation of all construction works until the storm event, including the storm runoff has passed. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy rainfall events, and before construction works recommence, the Proposed Wind Farm site will be inspected and corrective measures implemented to ensure safe working conditions e.g. dewatering of standing water in open excavations, etc. › Exposed soils/peat (exposed temporary stockpiles) will be sealed with the bucket of an excavator during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., overnight and weekends). With regards to the fluvial flood zones at the Proposed Wind Farm site, a managed retreat from the fluvial flood zones will be implemented in the event of a high intensity rainfall event and/or weather warning related to rainfall. This will include the following: › Any areas where soil/subsoil is exposed at the surface will be compacted firmly with a digger bucket of a suitably sized excavator. › Open trenches will be backfilled and compacted. › All oils, fuels and waste material will be removed from the flood zones. › Existing sediment control measures will be removed, as these may be washed away and deposited elsewhere by the floodwaters.		

			› Site access tracks will be scraps and any excess soft material will be removed from the flood zones. › All plant, machinery and equipment will be removed from the flood zones.		
MM96	Horizontal Directional Drilling along the Proposed Grid Connection	EIAR Chapter 4, 9 CEMP Section 3	› Near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); › The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance; › There will be no storage of material / equipment or overnight parking of machinery inside the hydrological buffer zone; › Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channels; › Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions / channels that slope towards the watercourse; › Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered; › The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages; › Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; › Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before been taken off-site; › If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);		

			› This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed settlement pond area at least 50m from the watercourse; › The discharge of water onto vegetated ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing; › Any sediment laden water from the works area will not be discharged directly to a watercourse or drain; › Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted; › Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse; › If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; › On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion; › The silt fencing upslope of the river will be left in place and maintained until the disturbed ground has re-vegetated; › There will be no batching of cement along the Proposed Grid Connection; › There will be no refuelling allowed within 100m of the watercourse crossing; and, › All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing. Fracture Blow-out (Frac-out) Prevention and Contingency Plan: › The drilling fluid will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used); › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;		

			› One or more lines of silt fencing will be placed between the works area and the adjacent river; › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; › Adequately sized skips will be used where temporary storage of arisings are required; › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped; › Any frac-out material will be contained and removed off-site; › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.		
MM97	Discharges	Appendix 4-3	› Water containing silt will not be discharged or pumped directly to any natural watercourse. All discharges will be made over open ground or into existing field drain with silt trap at a minimum of 20m from the nearest watercourse unless otherwise stated. › No excavated material will be stored within any surface water buffer zone. › Pumped water will be directed into track side ditches and treated in settlement ponds and vegetation swales prior to overland discharge. › Pumping of clean water from excavations/ or over-pumping in drains/ ditches/ steams will be completed in a manner that will not cause scour or erosion at point of release/ discharge. This will be done by reducing the flow velocities or by use of suitable splash plates, and/or other similar discharge controls. › Vegetation will not be stripped from existing drains/ ditches unless absolutely necessary.		
Operational Phase					
MM98	Replacement of Natural Surfaces with Lower	EIAR Chapter 4, 9	**Mitigation by Design:** The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described		

	Permeability Surfaces	Appendix 4-3 CEMP Section 3	below and as shown on the drainage drawings submitted with this planning application (Appendix 4-3): › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds have been designed in consideration of the greenfield runoff rate.
MM99	Runoff Resulting in Contamination of Surface Waters	EIAR Chapter 4, 9 CEMP Section 3	› Mitigation measures for sediment control are the same as those outlined above for the construction phase. With regards to hydrocarbons: › Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the Proposed Project. These vehicles will be refuelled offsite; › Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The

			bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked; › Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillages.		
Decommissioning Phase					
MM100	Decommissioning Phase	EIAR Chapter 9	The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works in comparison to construction phase works. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
EIAR Chapter 10 Air Quality					
Construction Phase					
MM101	Exhaust Emissions	EIAR Chapter 4, 10, 15 CEMP Section 3	› Proposed Project Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use. › Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All plant and materials vehicles shall be stored in dedicated areas (onsite).		

			› Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be sourced from local quarries. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).		
MM102	Dust Emissions	EIAR Chapter 10 CEMP Section 3	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site. › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. › Turbines and construction traffic will be transported to the Site on specified haul routes only. › The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Proposed Wind Farm site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary.		

			› The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and for the Proposed Wind Farm will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Dust monitoring gauges will be deployed across the Proposed Wind Farm site to detect any exceedances of acceptable dust levels. › Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movement. › A CEMP will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures › Groundworks (i.e., works with potential to create dust) associated with proposed turbines T01, T03, and T08 will be fully supervised by an ECoW. › Groundworks (works with potential to produce dust) at proposed turbines T01, T03, and T08 will be restricted to the marsh fritillary hibernation season (October to January inclusive) as larvae will be under vegetation and within hibernation webs which will act as a natural shield. › The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with all proposed mitigation as set out in above. › If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work. › The ECoW will have power to halt construction works if required as outlined above.		
Operational Phase					

MM103	Exhaust and Dust Emissions	EIAR Chapter 10	› Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. › When stationary, delivery and onsite vehicles will be required to turn off engines. › Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.		
Decommissioning Phase					
MM104	Decommissioning Phase	EIAR Chapter 10	Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less effect. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential effects.		
EIAR Chapter 11 Climate					
Construction Phase					
MM105	Greenhouse Gas Emissions	EIAR Chapter 4, 11, 15. CEMP Section 3	› Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Turbines and construction materials will be transported to the site on specified routes only unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details.		

			› It is intended to obtain the materials for the construction of the Proposed Wind Farm site from local licenced quarries. › Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas › A Construction and Environmental Management Plan (CEMP) (Appendix 4-5) will be in place throughout the construction phase. › The CEMP (Appendix 4-5) includes a Waste Management Plant (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. ○ The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. ○ Section 4.4.6 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, ○ The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be obtained from local appropriately authorised quarries, for the purposes of this assessment 6 no. existing, authorised quarries, located within 20km of the Proposed Wind Farm site have been selected. This will reduce journey distances of the delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements. › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
Operational Phase					
MM106	Greenhouse Gas Emissions	EIAR Chapter 11	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.		

Decommissioning Phase					
MM107	Decommissioning Phase	EIAR Chapter 11	Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 12 Noise & Vibration					
Construction Phase					
MM108	Construction Phase (Noise)	EIAR Chapter 12 CEMP Section 3	While it was concluded in Section 12.6.1 of Chapter 12 that there will be no significant noise impact associated with the construction of the Proposed Project and that no specific mitigation measures were required, the contract documents will clearly specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* The following list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria: › No plant used on site will be permitted to cause an on-going public nuisance due to noise. › The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.		

			› Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Table 12-1 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise.* › The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours.		
Operational Phase					
MM109	Operational Phase (Noise)	EIAR Chapter 12	**Amplitude modulation** In the event that a complaint which indicates potential Amplitude Modulation (AM) associated with turbine operation, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise (9 August 2016) or subsequent revisions. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including methods to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which may include turbine curtailment and/or stopping turbines under specific operational conditions. In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered		

			best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the Proposed Project will be effectively addressed by the operator. **Noise Monitoring** An operational noise survey will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of the Proposed Project being fully commissioned. If an exceedance of the noise criteria is identified as part of the c assessment, the guidance outlined in the IOA GPG, specifically Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 *Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels*.		
Decommissioning Phase					
MM110	Decommissioning Phase (Noise)	Chapter 4, 12 CEMP Section 3	No specific mitigation measures are required for decommissioning. To ameliorate any potential noise impacts that may present during the decommissioning phase, a schedule of noise control measures has been formulated in accordance with best practice guidance. These are outlined in the Construction and Environmental Management Plan (CEMP) that has been prepared for the Proposed Project.		
EIAR Chapter 13 Landscape & Visual					
Pre-Commencement, Construction, Operation and Decommissioning					
MM111	Landscape Effects	EIAR Chapter 13	**Mitigation by Design:** The Proposed Project was strategically selected in a landscape highly suitable for the development of wind energy. Through the iterative project design process, various best practice tools for assessing the landscape and visual impact of a proposed wind farm development were		

			utilised to bring forward the optimum design for the Proposed Wind Farm with respect to landscape and visual factors. These tools include landscape modelling, Zone of Theoretical Visibility (ZTV) mapping and the preparation of photomontage visualisations. The iterative design process was informed by the siting and design guidance for wind farms in specific landscape types as set out in the Guidelines (DoEHLG, 2006) and with regard to the Draft Guidelines (DoHPLG, 2019). The final design of the Proposed Project included the careful micro-siting of infrastructure with the aim of preventing the potential for significant landscape and visual effects. Details of the various turbine layout iterations included as part of this design process are included in this EIAR, Chapter 3: Consideration of Reasonable Alternatives. Landscape and visual 'mitigating' factors which were key to the site selection and design of the Proposed Wind Farm are established below, these factors or of key relevance to this LVIA in this chapter: › **Appropriate Wind Energy Development Zoning Ratings in Local Planning:** All proposed turbines are in Co. Galway land area zoned as 'Open to Consideration' for wind energy development in the Galway wind energy strategy policy. › **Appropriate Landscape Sensitivity in Local Planning:** The Proposed Wind Farm has been strategically sited within an area designated as 'Low' landscape sensitivity in local planning policy (Galway County Development Plan 2022-2028), a Landscape Character Area of the lowest landscape sensitivity rating in Co. Galway. › **Compliance with Wind Energy Development Guidelines Set-Back Distance:** Siting of proposed turbines exceeds the minimum 500m set-back distance from residences set out in the Guidelines (DoEHLG, 2006). › **No Impact on Designated Scenic Routes and Views:** The Proposed Wind Farm has been strategically sited in a location where there is no impact on any designated protected views as set out in local planning policy. › **No Impact on Designated Landscape Receptors:** The Proposed Wind Farm has been strategically sited in a landscape setting (an LVIA Study Area to 20km from the proposed turbines) with no designated or protected high sensitivity landscape receptors in local planning policy of county, regional or national renown.		

			› **Sparsely Settled & Highly Modified Landscape**: The infrastructure of the Proposed Wind Farm has been strategically sited within a sparsely settled landscape characterised by common agricultural land, commercial forestry and cutover peatland. It is therefore a modified working landscape deemed to be of low landscape sensitivity, and a site capable of effectively absorbing the Proposed Wind Farm. › **Flat Nature of the Proposed Wind Farm site & Surrounds.** The proposed turbines have been located within a flat site surrounded by lands of similar elevations which limit open views of the project. This topographic feature of the Proposed Wind Farm site and surrounds mitigates the potential for overbearing or domineering effects provided sufficient setback from receptors is designed into the project. It also means that separation distances between receptors and turbines becomes important as the proposed turbines appear smaller in scale quickly (over shorter distances) when viewed in this planar view. › **Localised Visual Screening:** Mature vegetation and undulating terrain restrict wider landscape visibility to primarily within a 5km radius. › **Large Setback from Population Centres and Receptors:** Site selection and siting of proposed turbines ensures limited visibility and large setback distances from large population centres and designated landscape and visual receptors of high sensitivity. › **Coherent Turbine Layout:** The proposed turbines are spaced appropriately in a curved linear array, such that they read coherently within the landscape and are of acceptable layout according to the recommended siting and design of turbines for Hilly and Flat Farmland in the Guidelines (DoEHLG, 2006), and cognisant of the Draft Guidelines (DoHLPG, 2019). › **Underground Grid Connection:** The intended connection to the national electricity grid is underground, thereby eliminating potential landscape and visual effects during the operational phase.		
EIAR Chapter 14 Archaeology, Architectural and Cultural Heritage					
Pre-Construction/ Construction Phase					
MM112	Indirect and Direct	EIAR Chapter 14	› Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the accessible locations of proposed turbine hardstands, temporary construction compounds, onsite substation and along the access roads and greenfield		

	Construction Phase	CEMP Section 3	section of the Proposed Grid Connection. Archaeological test trenching will be carried out under licence to the National Monuments Service of the DoHPLG and will permit the identification of previously unknown sub-surface archaeological features. This may be followed by further mitigation, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHPLG. These mitigation measures will ensure that previously unrecorded archaeological features are appropriately recorded and/or preserved in advance of construction commencing, mitigating the potential effects of the Proposed Project. › A large portion of the Proposed Wind Farm site is dominated by peat and forestry, which is not suitable for archaeological test trenching. Archaeological monitoring of topsoil stripping will be carried out at these locations, including lands adjacent to watercourses. Additionally, the section of Proposed Grid Connection that passes through greenfield will be subject to archaeological monitoring. This work will be carried out under licence to the National Monuments Service of the DoHPLG. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHPLG. › Where direct effects have been identified to townland boundaries as part of the construction of the Proposed Project, works will be subject to archaeological monitoring, to include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DoHPLG. › All excavations as part of the Proposed Grid Connection within the Zone of Notification of AH15 will be monitored under licence. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH.		
Operational Phase					
MM113	Indirect Operational Phase	EIAR Chapter 14	› Moderate indirect effects to the setting of ringforts AH97 and AH98 will be partially mitigated by the proposed linear replanting to the north and west of AH97 and to the south of AH98. It is noted that neither of these sites are accessible to members of the public.		

			› It is not possible to further mitigate indirect effects to archaeological, architectural and cultural heritage receptors due to the nature and scale of the proposed turbines within the landscape. Indirect effects are not permanent and would be removed following the decommissioning and removal of the turbines.		
EIAR Chapter 15 Material Assets					
Material Assets - Traffic					
Pre-Construction, Construction and Operation					
MM114	Traffic	EIAR Chapter 15	**Mitigation by Design** › Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.2.2 of Chapter 15. › Selection of the shortest Proposed Grid Connection diversion routes, minimising the impacts on the existing road network and traffic.		
MM115	Delivery of abnormal loads	Chapter 15	The following are the main points to note for these deliveries which will take place after peak evening traffic: › The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. › The deliveries will be made in consultation with the Local Authority and An Garda Síochána. › It is estimated that 64 abnormal sized loads will be delivered to the Site, comprising 22 convoys of 3 vehicles, undertaken over 8 separate nights. › These nights will be spread out over an approximate period of 5 weeks and will be agreed in advance with the relevant authorities		

			› In order to manage each of the travelling convoys, for each there will be two Garda escort vehicles that will stop traffic when required at the front and rear of the convoy of 3 vehicles. › There will also be two escort vehicles provided by the haulage company for each convoy.		
MM116	General Traffic Management	EIAR Chapter 15 Appendix 15-2	A detailed **Traffic Management Plan (TMP)** will be provided specifying details relating to traffic management and included in the CEMP prior to the commencement of the construction phase of the Proposed Project. The TMP will be agreed with the local authority and An Garda Síochána prior to construction works commencing onsite. The detailed TMP will include the following: › **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator will be appointed for the duration of the development, and this person will be the main point of contact for all matters relating to traffic management. › **Delivery Programme** – a programme of deliveries will be submitted to Galway County Council in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities, TII and MMaRC and will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the Site. › **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. › **A Pre and Post Construction Condition Survey** – Where required by the local authority, a pre-condition survey of roads associated with the Proposed Project can be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road		

			surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. › **Diversion routes during grid construction –** The identification and agreement with suitable diversion routes during the construction of the Proposed Grid Connection. › **Liaison with the relevant local authority** - Liaison with Galway County Council and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager. › **Implementation of temporary alterations to road network at critical junctions** – at locations highlighted in Section 15.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable. › **Identification of delivery routes** – These routes will be agreed with Galway County Council and adhered to by all contractors. › **Delivery times of large turbine components** - The TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. › **Travel plan for construction workers –** While the assessment above has assumed the worst case in that construction workers will drive to the Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the Site and identification of an area for parking. › **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4-5. › **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers		
Decommissioning Phase					

MM117	Decommissioning Phase	EIAR Chapter 15	In the event that the Proposed Project is decommissioned after the 35 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 and Appendix 4-6 Decommissioning Plan. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning, in accordance with Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013).		
Material Assets - Other					
Pre-Constructions Phase					
MM118	Existing Built Services	EIAR Chapter 4, 15	The Proposed Wind Farm has been designed to avoid exisiting underground electricity cables and can be described as mitigation by design, therefore there is no potential to give rise to effects on electrical services. Notwithstanding the above, specific measures are incorporated into the CEMP, included as Appendix 4-5 of this EIAR, to ensure that the construction of the Proposed Project will not have effect on underground electrical cables and built services at the Site. The mitigation measures include the following: › Goal posts will be established under overhead lines for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks ○ Prior to construction, the Applicant will engage with ESB via the 'Dial Before You Dig' procedure online. ESB will be contacted via dig@esb.ie **before** excavating near any overhead lines. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on the routes and operating voltages of overhead electricity lines running above the Proposed Grid Connection. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to site.		

			› Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › Prior to the delivery of turbines to the Proposed Wind Farm site, a dry run of the route using vehicles with similar dimensions will occur. › When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used is undertaken prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site. › All staff will be made aware of and adhere to the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'*. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan. › All health and safety measures as detailed in Section 5 of the CEMP and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. › Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. › Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. › Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks. › Prior to construction, the Applicant will engage with GNI via the 'Dial Before You Dig' procedure online. GNI will be contacted on 1800 42 77 47 **before** excavating near the identified high-pressure pipeline. Furthermore, the '*Safety advice for working in the vicinity of natural gas pipelines'* guidance document and the GNI '*Code of Practice*'		

			standards will be adhered to during all proposed works along the Proposed Grid Connection in vicinity of the high-pressure pipeline and the telecommunication lines. › The developer will also carry out further consultation in the pre-construction phase and construction phase with GNI to confirm the crossing methodology to be deployed and to ensure that no new service crossings have been implemented. Furthermore, site investigation will be undertaken post planning grant and results will be shared with GNI as part of the Design Review process prior to construction. › In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.		
Construction Phase					
MM119	Waste Management	EIAR Chapter 15 CEMP Section 3	› All waste generated on site during the construction phase will be contained in waste skip at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the site. Therefore, all waste streams generated on site will be deposited into a single waste skip. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal. › Site personnel will be instructed at induction that under no circumstances can personal waste be brought on site for disposal in the onsite waste skip. It will also be made clear that the burning of waste material on site is forbidden. › Further details on waste management are presented in Section 3.8 of the CEMP, which is included as Appendix 4-5.		
Operational Phase					

MM120	Waste Management Services	EIAR Chapter 15	› It is not anticipated that any significant volume of waste will be generated within the Site during the operational phase of the Proposed Project as only a small number of operational and maintenance personnel will be present within the Proposed Wind Farm site at certain times. Any waste generated due to the operation and maintenance of the Proposed Project will be disposed of in a covered skip, located within the proposed onsite 38kV substation compound. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.		
MM121	Telecommunications	EIAR Chapter 15 Appendix 15-4	In the event of interference occurring to telecommunications, the Guidelines (DoEHLG, 2006) acknowledge that *'electromagnetic interference can be overcome'* by the use of divertor relay links out of line with a wind farm. A signed protocol agreement between 2rn and the Applicant can be found in Appendix 15-4. The Protocol Document ensures that in the event of any interference occurring to television or radio reception due to operation of the Proposed Wind Farm, the required measures, as set out in the Protocol Document, will be carried out by the Applicant to rectify this. The Protocol Document ensures that the appropriate mitigation is carried out in the event of unanticipated broadcast interference arising to television or radio reception as a result of the Proposed Wind Farm.		
MM122	Aviation	EIAR Chapter 15	As no impacts were identified by the IAA or DoD, no mitigation measures are required. However, the following IAA and DoD requests will be complied with should the Proposed Project be consented: <u>Irish Aviation Authority</u> 1. *Agree an aeronautical obstacle warning light scheme for the wind farm development* 2. *Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and*		

			3. *Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.* <u>Department of Defence</u> 1. *All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near InfraRed (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.*		
Decommissioning Phase					
MM123	Decommissioning Phase	EIAR Chapter 15	Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent.		

18.2 EIAR Monitoring Measures

Table 18-2 Schedule of Monitoring

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Chapter 4, 9 CEMP Section 4	› An inspection and maintenance plan for the drainage system on-site will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the Project Hydrologist. The drainage inspection and maintenance plan are included in the CEMP in Appendix 4-5 of this EIAR.	On going	Monthly	Project Hydrologist
MX2	Invasive Species	EIAR Chapter 6 CEMP Section 3	› A pre-commencement invasive species survey shall be completed for the Site.	Once	As required	Project Ecologist
MX3	Marsh Fritillary	EIAR Chapter 6	› A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year in advance of construction throughout footprint areas of the Proposed Wind Farm › If active larval webs are recorded within the construction footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the construction footprint. This will be achieved by translocating	Once	As required	Project Ecologist

			a sod of earth with entire, intact devils' bit scabious plants upon which the larvae are feeding. › Larval webs and associated food plants would only be translocated by the ECoW to existing breeding areas as shown in Appendix 6-5. › Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres near T01, T03, T05 and T08. › ECOW supervision will be required for construction of components near existing breeding areas (such as Turbines T01, T03, T05, T08 and along the proposed access road to T02). › Where suitable marsh fritillary habitat occurs in close proximity to Proposed Wind Farm infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. › No clearance of scrub within the proposed bat buffer of Turbines T05 or T08 will be carried out until sufficient exclusion zone fencing to a minimum of 5m is in place, or unless under ECoW supervision			
MX4	Birds	EIAR Chapter 7 Appendix 7-7	› It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible to avoid the most sensitive time of the year for most bird species with the potential to use the Proposed Wind Farm site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Wind Farm site to identify sensitive sites (e.g. roosts). › Any requirement for construction works to run into the subsequent breeding or winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding or roosting birds of conservation concern. These surveys will be	Once	As required	Project Ornithologist

			conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). The survey will aim to identify sensitive sites (e.g., nests or roosts depending on the season in question). › This monitoring will involve surveying onsite and to a 500m radius of the Proposed Wind Farm footprint/works areas. Monitoring will be undertaken by a suitably qualified ornithologist. The survey period will include one month prior to the initiation of works, four visits between April and July and one visit during the winter period (October). If a sensitive area is identified, the nest/roost sites will be located, and no works shall be undertaken within a species-specific buffer in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works within the buffer zone shall be permitted until it can be demonstrated that the species is no longer reliant on the area for breeding or roosting. › All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.			
MX5	Tree Felling	EIAR Chapter 9	› Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week passes, or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).	As Required	Monthly	ECoW

Construction Phase						
MX6	Health and Safety	EIAR Chapter 4, 5 CEMP Section 5	The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; › Compile and develop safety file information; › Reporting of accidents / incidents; › Weekly Site meeting with PSCS; › Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ○ Induction of all site staff including any new staff enlisted for the project from time to time; ○ Toolbox talks as necessary; ○ Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ○ Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ○ Monitor the compliance of contractors and others and take corrective action where necessary; and ○ Notify the Authority and the client of non-compliance with any written directions issued.	Daily	Daily	PSCS
MX7	Water Quality and Monitoring		› During the construction phase, the Project Contractor will be responsible for the effectiveness of drainage measures. This	As required	As Necessary	ECoW

		EIAR Chapter 4, 9 CEMP Section 4	responsibility extends to drainage maintenance, to ensure that the installed drainage measures continue to perform as intended by the detailed drainage design. Silt fences, check dams, level spreaders and other drainage measures likely to form part of the detailed drainage design, require regular maintenance to ensure they continue to function effectively, and the Project Contractor is entirely responsible for this maintenance. › The drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance.			
MX8	Water Quality and Monitoring	EIAR Chapter 4, 9 CEMP Section 4	› Daily general visual inspections of site operations and inspections of all drainage infrastructure within the Site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW; › Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; › Event based inspections by the ECoW as follows: ○ >10 mm/hr (i.e. high intensity localised rainfall event); ○ >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, ○ Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week).	Daily	As Necessary	ECoW

			› Monthly site inspections by the Project Hydrologist/ ECoW during construction phase; › Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and › A written record will be maintained or available on-site within this Construction Environmental Management Plan (CEMP) which will be maintained on-site during the construction phase.			
MX9	Reactive Site Drainage Management	EIAR Chapter 4 Appendix 4-3	› The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time. › In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.	As required	As Necessary	ECoW
MX10	Water Quality and Monitoring	EIAR Chapter 9	› Daily surface water monitoring forms will be utilised at every works site near watercourses. These will be taken on a regular basis and kept onsite for record and inspection.	Daily	As Necessary	ECoW

MX11	Surface Water Quality	EIAR Chapter 9 CEMP Section 4	› Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. › Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in as outlined in Figure 9-6 of the EIAR. › Baseline sampling will be completed on at least two occasions, and these should coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell. › Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken.	As Required	Monthly	ECoW
MX12	Tree Felling	EIAR Chapter 9	› Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works › Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.	As Required	Monthly	ECoW

MX13	Plant and Equipment Inspections	EIAR Chapter 9	› The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX14	Traffic and Transport	CEMP Section 3	› The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the site entrances will be checked weekly or damage/potholes and repaired as necessary.	As required	Monthly	ECoW
MX15	Biodiversity	CEMP Section 4	A Project Ecologist/Ornithologist will be appointed. The responsibilities and duties of the Project Ecologist/Ornithologist will include the following: › Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. › Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site. › Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise. › Provide guidance to contractors to ensure legal compliance with respect to protected species on-site. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.	As required	As required	Project Ecologist/Ornithologist
MX16	Peat and Spoil Management	EIAR Chapter 4 CEMP Section 4	› Inspections of the peat and spoil management areas will be made by the Project Geotechnical Engineer through regular monitoring of the works	As required	As required	Geotechnical Engineer

MX17	Archaeological Monitoring	EIAR Chapter 13 CEMP Section 4	› Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › A report on the monitoring should be compiled on completion of the work and submitted to the NMS and the Local Authority. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.	As Required	As Required	Project Archaeologist
Operational Phase						
MX18	Drainage Inspections	CEMP Section 3	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.	Monthly	Monthly	ECoW
MX19	Bats	EIAR Chapter 6 Appendix 6-2	To assess the effects of the Proposed Project on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. **Bat Monitoring Plan** › Post-construction surveys will be carried out as per the pre-construction survey effort. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision.	Years 1, 2, 3	Annually	Project Ecologist

			› Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). › Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. › Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s).			
MX20	Biodiversity	EIAR Chapter 6 Appendix 6-4	Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared. The BMEP will be updated and amended where required to improve the efficacy of the prescribed works. **Marsh Fritillary Enhancement Measures:** › Following establishment of devils bit scabious in Blocks C, F and H, marsh fritillary habitat suitability assessments will be carried out in these areas as part of the Monitoring Plan. Habitat condition assessments include surveying along a predetermined route for the presence and abundance of devil's bit scabious as well as recording the vegetation height and any grazing evidence within the study site and is based on methodology and recording sheets designed by the National Biodiversity Data	As required. Years 1, 3, 5, 7, 10, 15, and 20 years	As required. Annually	Project Ecologist Project Ecologist

			Centre. Monitoring should be carried out between August and September when devils bit scabious in flower. The habitat suitability condition assessments should be carried out in Years 1, 3, 5, 7, 10, 15 and 20 of the Monitoring Plan. The results of the marsh fritillary breeding habitat suitablity assessments will inform whether adaptive management measures need to be introduced to improve the condition of the habitats for marsh fritillary. › Monitoring surveys will also include presence/absence surveys for marsh fritillary larvae initially in Blocks K and L and additionally in new breeding areas, i.e., Blocks C, F and H, throughout the Monitoring Plan. These will be carried out in accordance with best practice guidance (NRA 2009) and the National Biodiversity Data Centre (NBDC) Marsh Fritillary survey methodologies for larval web surveys. The optimum survey period for larvae is during August and September, in sunny conditions. Occupied larval webs will be recorded. **Monitoring of Hedgerow and Native Woodland Establishment:** In order to facilitate the successful establishment of the new trees to be planted within the Proposed Wind Farm site, the following measures are proposed: › New tree planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible. › During spring and autumn maintenance periods all trees and plants will be checked and adjusted/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. Where tree guards are no	Annually	As Necessary	Project Ecologist

			longer required these will be removed to avoid damage to the tree. › During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August. › Hedgerows and replanted trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within an Annual Monitoring Report (see Section 3.3 of the BMEP). **Cutover Peatland Enhancement Area:** The success of the measures in this area will be monitored throughout the Monitoring Plan periods prescribed as outlined above and will include vegetation relevés undertaken within the area. Fixed point 4 x 4 relevés with GPS coordinates and photos will be undertaken in both the cutover area (Block D) and within the immediately adjacent Article 17 mapped area. A minimum of 5 relevés from Block D will be recorded. The relevé data will be recorded in accordance with the methodology for cutover raised bog habitats set out in Smith et al (2020). The Project Ecologist will make recommendations as required within the Annual Environmental Report with regard to management measures or potential habitat condition improvements for Block D.	Annually	As Necessary	Project Ecologist

MX21	Birds	EIAR Chapter 7 Appendix 7-7	Survey methods employed for operational monitoring will be in line with guidelines issued by NatureScot (SNH, 2009) operational monitoring will be undertaken in operational Years 1, 2, 3, 5, 10 and 15 of the lifetime of the Proposed Wind Farm. Operational monitoring will include vantage point surveys and a programme of regular corpse searching of birds that may potentially collide with operating turbines during the operational phase of the wind farm project. Bird monitoring will include the following survey methods: › Flight activity surveys: monthly vantage point surveys › Targeted bird collision surveys (corpse searches) will be undertaken. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.	Years 1,2,3,5, 10 and 15	Monthly	Project Ornithologist
MX22	Noise and Vibration	EIAR Chapter 12	Operational noise surveys will be undertaken to ensure compliance with any noise conditions applied to the Proposed Wind Farm. It is common practice to commence surveys within six months of a wind farm being fully commissioned. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: *Post Completion Measurements* (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 *Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.* For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for	Once within six months	As Required	Noise Consultant

			specific turbines in specific wind conditions to ensure turbine noise levels are within the relevant noise criterion curves/planning conditions limits. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine performance. Following implementation of these measures, noise surveys can be repeated to confirm compliance with the noise criteria. Once compliance has been demonstrated, further surveys will not be necessary			
Decommissioning Phase						
MX23	Decommissioning	Decommissioning Plan Section 1	As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore: *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".* In this regard, the Decommissioning Plan (DP) will be reviewed and updated prior to commencement of decommissioning works to take account of the relevant conditions of the planning permission and current health and safety standards at the time of decommissioning.	End of Operational Life	As Required	Developer Appointed/ Contractor

MX24	Decommissioning	Decommissioning Plan Section 3	The ECoW will maintain responsibility for monitoring the decommissioning works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters. The Site Manager will be responsible for reporting to and liaising with GCC and other statutory bodies as required.	End of Operational Life	As Required	Site Manager/ ECoW
MX25	Decommissioning	Decommissioning Plan Section 3	The Site Manager in consultation with the ECoW will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	End of Operational Life	As Required	Site Manager/ ECoW
MX26	Decommissioning	Decommissioning Plan Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the Site to identify invasive species where any minor excavation will be required. If present in these areas, the ecologist will propose suitable management measures.	End of Operational Life	As Required	Project Ecologist
MX27	Health and Safety	Decommissioning Plan Section 4	› Report on Site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; › Monitor the compliance of contractors and others and take corrective action where necessary; and › Notify the Authority and the client of non-compliance with any written directions issued.	End of Operational Life	As Required	PSCS
MX28	Birds	Appendix 7-7	› It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible to avoid the most sensitive time of the year for most bird species with the potential to use the Proposed Wind Farm site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior	End of Operational Life	As Required	Project Ornithologist

			to the initiation of decommissioning works at the Proposed Wind Farm site to identify sensitive sites (e.g. roosts). › Any requirement for decommissioning works to run into the subsequent breeding or winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding or roosting birds of conservation concern. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). The survey will aim to identify sensitive sites (e.g., nests or roosts depending on the season in question). › This monitoring will involve surveying onsite and to a 500m radius of the Proposed Wind Farm footprint/works areas. Monitoring will be undertaken by a suitably qualified ornithologist. The survey period will include one month prior to the initiation of works, four visits between April and July and one visit during the winter period (October). If breeding or roosting activity is identified, the nest/roost sites will be located, and no works shall be undertaken within a species-specific buffer in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works within the buffer zone shall be permitted until it can be demonstrated that the species is no longer reliant on the nesting or roosting areas. › All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.			