17. SCHEDULE OF MITIGATION AND MONITORING PROPOSALS

17.1 Introduction

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

All mitigation which will be implemented during the various phases of the Proposed Development are presented in Table 17-1 below. The mitigation measures have been grouped together according to their EIAR Chapter and Proposed Development 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 the future phases of the Proposed Development. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-2 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during the course of Proposed Development phases 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 Development are outlined in Table 17-2. 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 Development 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 mitigations and monitoring measures, 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.

17.2 EIAR Mitigation Measures

Table 17-1 Schedule of Mitigation

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Development					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Section 4	› All proposed activities on the site of the Proposed Development will be provided for in an environmental management plan. A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included in Appendix 4-2 of this EIAR. The CEMP includes details of drainage, spoil management and waste management, and outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR.		
MM2	Environmental Management	CEMP Section 4	› The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Developments 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 Project Contractor, having been nominated by the developer to fulfil the role.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The ECoW will also have to call upon the Project Ecologist, Project Hydrologist, or other members of the Project Developer's design team, as required, to oversee the contractor's works on-site.		
MM3	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 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 Development.		
MM4	Surface Water Quality	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. The baseline monitoring programme will be subject to agreement with Westmeath County Council. › 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 9-5 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM5	Concrete Deliveries	EIAR Section 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.		
MM6	Waste Management	EIAR Section 4	› 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 plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to.		
MM7	Site Drainage Plan	EIAR Section 4 CEMP Section 4	› A detailed drainage design for the Proposed Development will be prepared prior to the commencement of construction to by the Project Hydrologist to incorporate these site drainage principles and carry forward into the construction phase of the Proposed Development. › 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 4 of the CEMP.		
MM8	Preparative Site Drainage Management,	CEMP Section 4	› 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. › 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.		
MM9	Drainage Inspection	CEMP Section 3	› Prior to commencement of works in sub-catchments across the site, main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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		
MM10	Watercourse Inspection	EIAR Section 4 CEMP Section 11	› Confirmatory inspections of the proposed new watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM11	Drainage Maintenance	EIAR Section 4 CEMP Section 4	› An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works on the Proposed Development. 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 supervising hydrologist.		
MM12	Earthworks	CEMP Section 2	› 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.		
MM13	Felling	EIAR Section 4, 7	› Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the keyhole and extraction works. › Pre-construction surveys will be undertaken prior to the initiation of works at the Wind Farm Site. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If it is found to be active		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. › Prior to the commencement of felling works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals will be carried out		
MM14	Felling Drainage Management	EIAR Section 4, 9	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; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
MM15	Felling Licence	EIAR Section 4	› 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.		
MM16	Traffic Management	EIAR Section 4, 14	› 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 7	› When the Grid Connection underground electrical cabling route 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		
MM17	Spoil Management	EIAR Section 4 CEMP Section 2	› Prior to the use of areas for spoil management an interceptor drain will first be excavated upslope in order to intercept existing overland flow and divert it around the spoil management area prior to discharge via a buffer zone on the downslope side. › Drainage swales to intercept and collect drainage water from construction area will be provided on the downhill side of the spoil management area to surface water run-off and transfer it to a settlement pond prior to discharge via a buffered outfall and swale. › Silt fences and double silt-fences will be emplaced down-gradient of 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		
MM18	Grid Connection underground electrical cabling route trench excavation, and communications chambers/joint bay installation, and watercourse,	EIAR Section 4	› The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the planning corridor assessed is subject to approval by ESBN and Eirgrid. › Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Westmeath County Council, Offaly County Council etc. will be contacted and all up to date drawings for all existing services sought.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	culvert and drain crossings				
Construction Phase					
MM19	Refuelling	EIAR Section 4 CEMP Section 4	› On-site refuelling of machinery will be carried out at dedicated refuelling locations using a mobile double skinned fuel bowser. The fuel bowser, a double-axle custom-built refuelling trailer will be re-filled off site and will be towed around the Wind Farm Site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the Proposed Development. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use. › Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays, spill kits and fuel absorbent mats will be available if necessary, during all refuelling operations. › Fuels volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction and 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; › An emergency plan for the construction phase to deal with accidental spillages is contained within Section 5 of the CEMP. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM20	Plant and Equipment Inspections	CEMP Section 3	› A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the construction phase.		
MM21	Concrete Deliveries and Management	EIAR Section 4 CEMP Section 3	The risks of pollution arising from concrete deliveries will be further reduced by the following: › No batching of wet-cement products will occur on the Wind Farm Site/along the underground electrical cabling route works or near other ancillary construction activities. › 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; › No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on Site, only the chute will need to be cleaned, using the smallest volume of water possible. 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 is to be directed into a dedicated concrete wash out pit. Decommissioning of this pit will occur at the end of the construction phase and water and solids will be tanked and removed from the site to a suitable, non-polluting, discharge location; › All concrete will be paced in shuttering and will not be in contact with soils or groundwater until after it has set; › Use weather forecasting to plan dry days for pouring concrete; and, › Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › 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; › The 50 m wide watercourse buffer zone and 10 m existing artificial drainage buffer will be in place for the duration of the construction phase. No construction activity will occur within the buffer zone with the exception of clear span crossing and culvert construction. The buffer zone will: › Prevent any cement-based products accidentally entrained in the construction phase drainage system entering directly into watercourses, achieved in part by ending drain discharge outside the 50 m buffer zone and allowing percolation across the vegetation of the buffer zone; › Provide a buffer against accidental direct pollution of surface waters by any pollutants, or by pollutants entrained in surface water run-off.		
MM22	Road Cleanliness	EIAR Section 4 CEMP Section 3	› The site 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 Development.		
MM23	Watercourse Buffers	EIAR Section 4. CEMP Section 3	› There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Development.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Buffered outfalls which will be numerous over the site which 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 site; and,		
MM24	Water Discharge	EIAR Section 4. CEMP Section 3	› There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. › 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 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 upgradient of where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;		
MM25	Wastewater Management	EIAR Section 4 CEMP Section 2	› The construction compound 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 on site for hygiene purposes, by way of a temporary storage tank.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM26	Drainage Swales	EIAR Section 4 CEMP Section 3	› 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.		
MM27	Interceptor Drains	EIAR Section 4 CEMP Section 3	› Interceptor drains will be maintained 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.		
MM28	Check Dams	EIAR Section 4 CEMP Section 3	› Check dams will be maintained at regular intervals along interceptor drains and swales/roadside drains in order to reduce flow velocities and therefore minimise erosion within the system during storm rainfall events;		
MM29	Level Spreaders,	EIAR Section 4 CEMP Section 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.		
MM30	Piped Slope Drains	EIAR Section 4 CEMP Section 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;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM31	Vegetation Filters	EIAR Section 4 CEMP Section 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;		
MM32	Settlement Ponds	EIAR Section 4 CEMP Section 3	› Stilling ponds/settlement ponds, emplaced downstream of swales and roadside drains, 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. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. Inspection and maintenance of all settlement ponds will be ongoing through the construction period.		
MM33	Dewatering Silt Bag	EIAR Section 4 CEMP Section 3	› 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. › 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM34	Siltbuster	EIAR Section 4 CEMP Section 3	› Siltbusters or similar equivalent piece 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.		
MM35	New Culverts/ Culvert Upgrades	EIAR Section 4	› All new proposed culverts and proposed culvert upgrades 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 Development, 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. In some cases, two or more smaller diameter culverts may be used where this depth is limited, though this will be avoided as they will have a higher associated risk of blockage than a single, larger pipe. 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.		
MM36	New Watercourse Crossing	EIAR Section 4	› 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 2	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 pre-cast concrete slab 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. › The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.		
MM37	Silt Fences	EIAR Section 4 CEMP Section 3	› Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream or 100m buffer zone of a lake, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Development. 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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.		
MM38	Sedimats	EIAR Section 4	› 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		
MM39	Oil Interceptors	EIAR Section 4 CEMP Section 4	› A limited amount of fuel will have to be stored on the Wind Farm Site and for the Grid Connection in appropriately bunded containers and a bunded area for oil storage will be constructed within the compound.		
MM40	Grid Connection underground electrical cabling route trench excavation, and communications chambers/joint bay installation, and watercourse, culvert and drain crossings	EIAR Section 4 CEMP Section 7	› Any underground services encountered along the cable route 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 communications duct 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › 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 planning corridor assessed is subject to approval by ESBN and Eirgrid. › The crossing methodologies employed at the other culvert and manmade drain crossings along the underground electrical cabling route, will be selected from the suite of watercourse crossing options outlined below, as appropriate, depending on culvert type, depth, size and local ground conditions. › 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled "Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites", and these guidelines will be adhered to during the construction of the Proposed Development.		
MM41	Excavations	EIAR Section 4 CEMP Section 4	› 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 site with excavated spoil being transported and stored in the identified spoil management areas within the Wind Farm 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 foundation;		
MM42	Spoil Management	EIAR Section 4 CEMP Section 4	› The spoil management areas and placement of spoil alongside access roads have been selected based on the locations of spoil generation, areas suitable for spoil management and environmentally constrained areas such as identified site-specific flood modelled zones as detailed in Chapter 9: Water. › Placement of spoil alongside access roads will consist of a 3m wide berm on either side of the road as appropriate. Spoil placement		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			alongside access roads will take place outside of watercourse buffers and of the site-specific flood modelled zone within the Wind Farm Site (a 110m section of access road). › At the identified spoil management areas, the vegetative top-soil 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 identified spoil management areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil it being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil management area until the area is full. › In the case of T04 where spoil management areas will be within areas of felled forestry, no topsoil will be excavated. The tree stumps will be left in-situ and the spoil will be placed on top of the existing ground and finished with a layer of topsoil from within the site. › The placement of spoil will be restricted to a maximum height of 1.0m, subject to confirmation by the Geotechnical Engineer. › Where practical, it will be ensured that the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil. › Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 2 (h) in the dedicated spoil management zones and not greater than 1 (v): 1 (h) alongside access tracks. › Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas. › Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level. › The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. › All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction. › Prior to the use of areas for spoil management an interceptor drain will first be excavated upslope in order to intercept existing overland flow and divert it around the spoil management area prior to discharge via a buffer zone on the downslope side. › Drainage swales to intercept and collect drainage water from construction area will be provided on the downhill side of the spoil management area to surface water run-off and transfer it to a settlement pond prior to discharge via a buffered outfall and swale. › Inspections of the spoil management areas will be made by a geotechnical engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive surface water runoff from being generated. › The surface of the spoil management area will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. Where there is a risk of inadvertent access into spoil management areas fencing will be provided.		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM43	Wastewater Management	EIAR Section 4	The wastewater storage tank alarm will be part of a continuous stream of data from the Wind Farm Site's 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 Wind Farm Site. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Full details of the proposed tank alarm system can be submitted to the Planning Authority in advance of any works commencing on-site. The wastewater storage tank alarm will be part of a continuous stream of data from the Wind Farm Site's 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 Wind Farm Site.		
MM44	Electrical Substation	EIAR Section 4, CEMP Section 7	› The electrical substation compound will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. › Perimeter fencing will be erected around the substation and control buildings compound area.		
MM45	Surface water Flooding	EIAR Section 4	› There is 110 metres of proposed access road within site-specific flood modelled 100-yr and 1000-yr zone within the Wind Farm Site. The new access tracks proposed on the Wind Farm Site are proposed to be		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 2	founded on competent stratum and the track surface will be built up by at least 500mm above the flood modelled elevation of both the 100-yr and 1000-yr site-specific modelled flood events › There is an existing field drain which will be culverted under the proposed access track. This culvert will provide a drainage outlet for flood water following a significant flood event. This will prevent any damming effect from the proposed access road within this section.		
			Decommissioning Phase		
MM46	Decommissioning	EIAR Section 4	The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time		
MM47	Decommissioning	EIAR Section 4 DP Section 2	› Upon decommissioning of the Wind Farm Site, all above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. › On removal of turbines, the covering of the foundation will be completed using locally sourced material imported to site as the required quantity of material does not currently exist at the site. The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation. › The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM48	Decommissioning	EIAR Section 4 DP Section 3	The following mitigation measures are proposed to avoid release of hydrocarbons at the site: › Road-going vehicles will be refuelled off site wherever possible; › On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required › Only designated trained and competent operatives will be authorised to refuel plant on site. › Fuel volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately; › The plant used will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the decommissioning phase to deal with accidental spillages will be developed (refer to DP Section 3). Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the decommissioning phase.		
Chapter 5: Human Beings					
Pre-Commencement Phase					
MM49	Human Health	EIAR Section 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 identified in line with the engagement plan. Local access to properties will also be maintained throughout any construction works and local residents will also be supplied with the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
			Construction Phase		
MM50	Human Health	EIAR Section 5	The Proposed Development will be constructed, operated and decommissioned 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). A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. Fencing will be erected in areas of the Site where uncontrolled access is not permitted. Appropriate health and safety signage will also be erected on this fencing and at locations around the Site. Health and safety guidelines for working within and around electrical substations and overhead lines will be adhered to on site.		
MM51	Human Health	EIAR Section 5, 11	› Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern; › Ensure that any extraordinary site work occurring outside of the core working hours (for example, crane operations lifting components		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			onto the tower) will be programmed, when appropriate, so that haulage vehicles would not arrive at or leave the site between 19:00 and 05:00, with the exception of abnormal loads that would be scheduled to avoid anticipated periods of high traffic flows; › All vehicles and mechanical plant will be fitted with effective exhaust silencers and be subject to programmed maintenance; › Select inherently quiet plant where appropriate - all major compressors would be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which would be kept closed whenever the machines are in use; › All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers; › Machines will be shut down between work periods (or when not in use) or throttled down to a minimum; › Regularly maintain all equipment used on site, including maintenance related to noise emissions; › Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; and › All ancillary plant such as generators and pumps will be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures will be provided. Where the BS5228 threshold levels are anticipated to be exceeded due to directional drilling activities along the underground electrical cabling route, the following are examples of measures that will be considered, where necessary, to mitigate noise emissions from these activities are as follows: › Temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from heras fencing or similar. Installation will be as close to the drilling rig as is practicable and fitted so as to		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			interrupt any direct line of site between the drilling rig and the closest residential receptors. › Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc. It is anticipated that this will be required should directional drilling be used for water crossings 3, 7 and 11, which are in close proximity to sensitive receptors.		
MM54	Human Health	EIAR Section 5, 10	In periods of extended dry weather, dust suppression may be necessary, and along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from the Site's drainage system, and will be pumped into a bowser or water spreader to dampen down haul roads and the temporary construction compound to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.		
			Operational Phase		
MM55	Human Health	EIAR Section 5	The build-up of ice on turbines is unlikely to present problems. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation. Lightning conduction cables, encased in protection conduits, will follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during the construction of the turbine foundations Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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. 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 and providing for access for emergency services at all times.		
MM56	Shadow Flicker	EIAR Section 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or 3rd party dwelling, a site visit will be undertaken firstly to determine the existing screening and window orientation. This will determine if the receptor has an actual line of sight to any turbine. Once this is completed and all of the potential receptors identified, the following measures will be employed; **Screening Measures** 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:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. **Wind Turbine Control Measures** 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 SCADA control system to change a particular turbine's operating mode during certain conditions or times, or even turn the turbine off if necessary.		
Chapter 6: Biodiversity					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Pre-Commencement Phase		
MM57	Invasive Species Management	EIAR Section 6 CEMP Section 3	A baseline invasive species survey will be 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.		
MM58	Fauna	EIAR Section 6	**Otter:** › As otter are known to occur within watercourses within the Wind Farm Site, and likely also those crossed by the Grid Connection, taking the precautionary principal, a pre-commencement otter survey will be undertaken upstream and downstream of all proposed watercourse crossings/culvert upgrades within the Wind Farm Site and watercourse crossings along the Grid Connection Underground Cabling Route. › From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Development footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for. › All conditions of a derogation licence will be implemented in full. › No works should be undertaken within 150m of any holts at which breeding females or cubs are present. › No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			hand or scrub clearance should also not take place within 15m of such holts, except under licence (TII, 2006[1]). **Badger:** In order to fully assess the potential for disturbance related effects on badgers during construction, especially given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction badger survey will be carried out in order to assess activity levels at setts and to identify any additional sett entrances that may have been excavated in the intervening period. Any active setts recorded within 50m of the Proposed Development footprint and will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity, and to assess the requirement for specific mitigation measures to limit disturbance. All badger survey work will be undertaken in line with current best practice guidance[2]. Should any setts within 50m of the Proposed Development be found to be in active use by badgers during the pre-construction badger monitoring, it would be necessary to ensure that the risk of disturbance to badgers is mitigated appropriately. Any badger mitigation required would be undertaken following published best practice guidelines for the treatment of badgers (NRW, 2009) and in consultation with NPWS. Any setts that could potentially be subject to direct impacts would be excluded and closed in consultation with NPWS, and wherever possible subsequently re-opened following completion of construction to allow badgers to recolonise them. If any works within 50m of an active sett are to take place during the badger breeding season (i.e. July 1st – November 30th) temporary		

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

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

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			exclusion of these setts during the construction phase would be required prior to the breeding season commencing. The setts would be excluded and closed in consultation with NPWS, and subsequently re-opened following completion of construction to allow badgers to recolonise them. Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Development to avoid heavy machinery access or materials storage in close proximity to the identified badger sett within the forestry that occurs within 30 metres of the proposed forestry felling: › Exclusion zone fencing and appropriate signage will be put in place to prevent any activity that could directly impact the sett. **Pine Marten:** In order to fully assess the potential for disturbance related effects on pine marten at the time of construction, especially given the time that can elapse between the original surveys and any future planning consent and construction, a pre-construction mammal survey will be carried out in order to assess activity levels at the den location used by the species during 2020, and to identify any additional dens within the Site that may have been created or become occupied in the intervening period. Any active dens recorded within 100m of the Proposed Development will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by pine marten and levels of activity, and to assess the requirement for additional mitigation measures. All survey work will be undertaken in line with current best practice guidance[3].		

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

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Should any active pine marten dens within 30m of the Proposed Development footprint (or breeding dens within 100m), including felling buffers, be found to be in active use by the animals during the pre-construction monitoring, it would be necessary to ensure that the risk of direct mortality and disturbance to pine marten is mitigated appropriately. Any pine marten mitigation required would be undertaken following published best practice guidelines and in consultation, and where required under licence from, NPWS. Where any breeding is found to be occurring at dens that could potentially be directly or indirectly affected, no works within 100m will be carried during the breeding season (March – June inclusive), and monitoring with camera traps will be required to ensure until all animals have left the den following breeding prior to any commencement of works within 100m of a breeding den. A derogation licence would be required for any works that could potentially cause disturbance to an occupied pine marten den.		
MM59	Bats	Appendix 6-2	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. As such, the trees with potential roosting features have been considered as a "roost resource" and compensation will be provided to cover for the loss of the resource. The following procedures are proposed prior to felling trees with PRFs: › A bat derogation licence will be obtained from the NPWS for the loss of the roost resource, prior to felling, and the felling activity will be supervised by a qualified ecologist. › Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			○ Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist at the time of felling. ○ Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move. ○ Rigged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist. ○ Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006). ○ Any tree felling will be undertaken outside the bat maternity season (May-August) and the hibernation period (December-February) (Marnell, Kelleher and Mullen, 2022). Where the potential for indirect effects (i.e. disturbance) on bats potentially roosting within watercourse, drain and culvert crossing infrastructure has been identified, the following mitigating procedures are proposed: ○ An inspection survey will be carried out prior to the commencement of the works to ensure no bats are roosting within the infrastructure. ○ If the inspection survey cannot provide sufficient data to exclude the presence of a roost (i.e. due to lack of access), an activity survey will also be conducted prior to commencement. ○ Where evidence of bats is identified during the above pre-commencement surveys, a Derogation Licence will be required from NPWS for the continuation of the works. ○ The works will be carried out outside the maternity (May-August) and hibernation (November-March) seasons to avoid the potential for disturbance on bats during sensitive periods of their lifecycle.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Construction Phase					
MM60	Bats	EIAR Section 6 Appendix 6-2	› During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001SI 359/1996). › Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction (and post construction), shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Development, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Wind Farm Site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. › The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK.		
MM61	Aquatic Habitats	EIAR Section 6	› A detailed drainage maintenance plan for the Proposed Development is provided in Chapter 4, Section 4.6.7 of this EIAR with additional drainage details described in Section 4.6 generally. › In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: 'Water' of this EIAR, see Section 9.5. This provides specific mitigation for the proposed works including mitigation by		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			avoidance, mitigation by design, tree felling, water treatment measures and surface water quality monitoring. › The upgrade of existing access tracks and construction of new tracks will involve some works within 50m of watercourses and new watercourse crossings. However, no instream works are proposed to natural watercourses, and a suite of measures are in place to avoid any adverse effects on watercourses		
MM62	Hedgerow and Treelines	EIAR Section 6	It is proposed to plant 3,350m of new hedgerow habitat to offset this potential loss and to provide additional habitat connectivity within the Wind Farm Site Overall, the proposed replanting will result in a net gain of approximately 1,012m in the linear landscape features within the Wind Farm Site. Planting will be of species indigenous to the local area.		
MM63	Aquatic Fauna	CEMP Section 2	In relation to new watercourse crossings, Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of the installation of pre-cast concrete bottomless box culverts. The Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters; and the Scottish Natural Heritage (SNH) Good Practice During Wind Farm Construction (SNH, 2019, 4th Edition) will also be adhered to. 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).		
MM64	Invasive Species	EIAR Section 6	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works, if they are identified prior to the commencement of the construction phase: › A risk assessment and method statement must be provided by the Contractor prior to commencing works.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	› 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 should be decontaminated prior to relocating to a different works area. The decontamination procedures should 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Operational Phase					
MM65	Bats	EIAR Section 6 Appendix 6-2	In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented. A full description of the mitigation measures proposed during operational phase are described in section 6.1 of the Bat report. Details of this mitigation and how it is calculated is provided in Appendix 6-2. **Blade Feathering** On a precautionary basis, and in addition to buffers applied to habitat features, it is proposed that all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). **Bat Mitigation and Monitoring Plan** Full details of the proposed operational bat monitoring programme for the Proposed Development are provided in Section 6.2.1 of the Bat Report (Appendix 6-2) › The 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 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).		
Decommissioning Phase					
MM66	Decommissioning	EIAR Section 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.		
EIAR Chapter 7 Birds					
Pre-Commencement Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM67	Birds	EIAR Section 7	Pre-construction surveys will be undertaken prior to the initiation of works at the Wind Farm Site. The survey will include a thorough walkover survey to a 500m radius of the Proposed Development footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase.		
Construction Phase					
MM68	Birds	EIAR Section 7	If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If it is found to be active during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		
MM69	Birds	EIAR Section 7	› Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. › The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Acts 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › Silt fences will be installed as an additional water protection measure around existing watercourses. › If bird breeding activity of species of conservation concern are identified during the works, the nest sites will be located, and no works shall be undertaken within 500m buffer in line with industry best practice. › An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: ○ Organise the undertaking of a pre-construction walkover bird survey to ensure that significant effects on birds will be avoided. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the 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.		
Decommissioning Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM70	Birds	EIAR Section 7	During the decommissioning phase, disturbance limitation measures will be as per the construction phase.		
EIAR Chapter 8 Land Soils & Geology					
Construction Phase					
MM71	Earthworks	EIAR Section 8	› Mitigation by Design: › The soils and subsoil which will be removed during the construction of turbine hardstands will be localised to the turbine locations. The soil/subsoil will be placed/spread locally alongside the excavations or accommodated within the spoil management areas; › Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › All materials which require storage will be stockpiled at low angles (< 5-10°) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system; › Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1m; › No turbines or related infrastructure will be constructed in any designated sites such as NHAs or SACs; › Placement of internal cable trenching will also be volume neutral, and all excess material will be managed locally and, › Excess spoil from the underground electrical cabling route works will be placed within the spoil management areas within the Wind Farm Site or disposed at an off site licenced facility.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM72	Contamination of Soils	EIAR Section 8	› Where possible maintenance of construction vehicles or plant will take place off-site. This applies to both at the Wind Farm Site and the Grid Connection. Minimal maintenance of construction vehicles or plant will take place on-site; › On-site re-fuelling will be undertaken using a double skinned bowser with spill kits on the ready for any minor accidental leakages or spillages; › Fuels stored on Site will be minimised but will be appropriately bunded; › All waste tar and chip material arising during construction of the underground electrical cabling route will be removed off-site and taken to an appropriately licenced facility; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (CEMP) Appendix 4-2 of this EIAR. Spill kits will be available to deal with accidental spillage in and outside of re-fuelling areas.		
MM73	Erosion of soils	EIAR Section 8	› Soil/subsoil removed from the Wind Farm Site infrastructure footprint will be used for landscaping, or accommodated in the identified spoil management areas within the Wind Farm Site. › Temporary drainage systems will limit runoff impacts during the construction phase. › In forestry areas (near T4) 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. › Soil/subsoil removed from the underground electrical cabling route trench will be transported to the on-site spoil management areas or to a local licenced facility. › Temporary drainage systems will limit runoff impacts during the construction phase. › The underground electrical cabling route will be constructed in a stepwise manner along its length. This will minimise the time any particular section of the underground electrical cabling route trench is open before being reinstated.		
Operational Phase					
MM74	Soils and Geology	EIAR Section 8	Mitigation measures for soils and geology during the operational stage of the Proposed Development include the use of aggregate from authorised quarries for use in road and hardstand maintenance. Oil used in transformers (at the substation and within each turbine) and storage of oils in tanks at the substation will be bunded capable of holding 110% of the oil in the transformer and storage tanks. Turbine transformers are located within the turbines, so any leaks would be contained. These mitigation measures are considered sufficient to reduce risk to soil/soils and subsoils, and groundwater and surface water quality.		
Decommissioning Phase					
MM75	Decommissioning Phase	EIAR Section 8	Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. Some of the effects associated with reinstatement of the Wind Farm Site (excavation of turbine bases, access tracks etc.) will be avoided by leaving these in place. The bases will be rehabilitated by covering with local topsoil in order to regenerate vegetation which will reduce runoff and sedimentation effects. Mitigation measures to avoid contamination by		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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-Commencement Phase					
MM76	Earthworks	EIAR Section 9	**Mitigation by Avoidance:** The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to main drains). 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 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; **Timing of Site Construction Works:** Construction of the Wind Farm Site drainage system will only be carried out during periods of 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. Construction of the drainage system during		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.		
Construction Phase					
MM77	Earthworks	EIAR Section 9	The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to main drains). Spoil management areas for removed soil/subsoil will be localised to spoil management areas outside of these buffer zones and will be designed and constructed with the minimal amount of surface area exposed. In these spoil management areas, the vegetative top-soil layer will be removed and re-instated or reseeded directly after construction, allowing for re-vegetation which will mitigate against erosion. Additional control measures, which are outlined further on in this section, will be undertaken at the proposed watercourse and drain crossing locations. More than 95% of the underground electrical cabling connection route 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. 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. In addition, measures which are outlined below will be implemented to ensure that		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse. **Water Treatment Train:** If the discharge water from construction areas fails to be of a high quality, 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. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to watercourses 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 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 emplaced 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, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters. **Management of Runoff from Spoil Management Areas:** It is proposed that excavated soil will be used for landscaping where required.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			During the initial construction of roads, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas. Where applicable, the vegetative top-soil layer of the spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.0 metres, following which the vegetative-top soils layer will be reinstated. Where reinstatement is not possible, spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff. **Management of Runoff from underground electrical cabling route and existing and proposed access roads:** Where construction is undertaken along sections of the underground electrical cabling connection route, proposed access road or existing roads requiring upgrade, the drainage management infrastructure (as outlined above) will be in place to manage and control runoff from the trench excavation area. Where the internal electrical cable trench is to be constructed off-road (within the Wind Farm Site) or for the Grid Connection underground electrical cabling route along public roads, surface water control measures such as silt fences will be employed when work is required within hydrological buffer zones.		
MM78	Tree Felling	EIAR Section 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. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" **Mitigation by Design:**		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; › 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; › Ditches which drain from the proposed area to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities; › Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the spoil management 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 may be necessary to install double or triple sediment traps. This measure will be reviewed on site during construction; › All drainage channels will taper out before entering the aquatic buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			soils, silt traps will be installed at the end of the drainage channels, to the outside of the buffer zone; › 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. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimized and controlled; › Brash mats will be used to support vehicles on soft ground, reducing mineral soils 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 should be suspended during periods of high rainfall; › Timber will be stacked in dry areas, and outside a local 50m watercourse buffer. Straw bales and check dams to 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 run-off; › Checking and maintenance of roads and culverts will be on-going through the felling operation; › Any diesel or fuel oils stored at the temporary site compounds will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; › Refuelling or maintenance of machinery will not occur within 100m of a watercourse. 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			have been completed, but care will be taken to avoid removing natural debris deflectors. **Drain Inspection and Maintenance:** The following items shall be carried out during inspection pre-felling 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 inspection, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; › Following tree felling all main drains shall be inspected to ensure that they are functioning; › Extraction tracks near drains need to 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 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.		
MM79	Site Drainage Management	EIAR Section 9	**Pre-emptive Site Drainage Management:** The works programme for the initial construction stage of the Proposed Development 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Works will be suspended if forecasting suggests any of the following is likely to occur, or if on-site monitoring indicates any of the following has occurred: › >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, and after, works being suspended the following control measures will be undertaken: ○ All open excavations will be secured and sealed off; ○ Provide temporary or emergency drainage to prevent back-up of surface runoff; and, Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.		
MM80	Excavation Dewatering and Surface Water Quality	EIAR Section 9	**Proposed Mitigation Measures (By Design)** Management of excavation seepage 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;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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; and, › Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped and a geotechnical assessment undertaken.		
MM81	Potential Release of Hydrocarbons	EIAR Section 9 CEMP Section 3	Proposed mitigation measures to avoid releases of fuel and other chemicals at the site are: › Onsite re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off Site (Wind Farm Site and Grid Connection), and will be towed around the Site by a 4x4 jeep to where machinery is located. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the temporary construction compound when not in use and 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 be used during all refuelling operations; › Refuelling or maintenance of machinery will not occur within 100m of a watercourse; › Fuels stored on site will be minimised;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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; › The plant used will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-2). Spill kits will be available to deal with accidental spillages.		
MM82	Wastewater Management	EIAR Section 9	**Proposed Mitigation Measures (By Avoidance)** › The temporary construction compound adjacent to the onsite substation located within the Wind Farm Site will be used for the construction of the northern section of the underground electrical cabling route; › Port-a-loos with an integrated waste holding tank will be used at the temporary construction compounds, maintained by the providing contractor, and removed from Wind Farm Site on completion of the construction works; › Mobile welfare units will be used during the construction of the underground electrical cabling route, particularly towards the south of the route; › Water supply for the Wind Farm Site office and other sanitation will be brought to the Wind Farm Site and removed after use from the Wind Farm Site to be discharged at a suitable off-site treatment location; and, › No water will be sourced on the Wind Farm Site, or discharged to the Wind Farm Site.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM83	Release of Cement-Based Products	EIAR Section 9	**Proposed Mitigation Measures** Mitigation by Avoidance: › No batching of wet-cement products will occur on the Wind Farm Site/along the underground electrical cabling route works or near other ancillary construction activities. 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; › No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on Site, only the chute will need to be cleaned, using the smallest volume of water possible. 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 is to be directed into a dedicated concrete wash out pit. Decommissioning of this pit will occur at the end of the construction phase and water and solids will be tanked and removed from the site to a suitable, non-polluting, discharge location; › All concrete will be paced in shuttering and will not be in contact with soils or groundwater until after it has set; › Use weather forecasting to plan dry days for pouring concrete; and, › Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.		
MM84	Morphological Changes to Surface		**Proposed Mitigation Measures (By Design):** › Where possible all proposed new stream crossings will be bottomless culverts and the existing banks will remain undisturbed. No in-stream		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Watercourses and Drainage Patterns		excavation works are proposed and therefore there will be no impact on the stream at the proposed crossing location; › Within the Wind Farm Site where the site underground cabling runs adjacent to a proposed access road or an existing access road proposed for upgrade, the cable will pass over the culvert (where one exists or is proposed) within the access road; › Within the Wind Farm Site, where a proposed access road crosses an existing field drain, the crossing will include a suitably sized pipe at the correct invert level to maintain the existing flow regime and prevent ponding. › Any guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland will be incorporated into the design of the proposed crossings. A 10m buffer is applied to main drains to allow for future OPW maintenance; › Works will be completed in accordance with the requirements of "*Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters";* and, › All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent. With respect to the Grid Connection underground electrical cabling route watercourse crossings, 4 construction crossing methods are proposed that will avoid in-stream works Mitigation Measures relating to the use of a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water for directional drilling include:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The area around the Clear Bore™ batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages; › One or more lines of silt fences will be placed between the works area and adjacent rivers and streams on both banks; › Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and, › Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.		
MM85	WFD Water Body Status	EIAR Section 9	**Proposed Mitigation Measures (By Avoidance)** Changes in surface water or groundwater flow regimes and water quality has the potential to impact on the objectives and status of the associated Groundwater Bodies and Surface Water Bodies. Mitigation measures relating to surface water drainage regimes and water quality protection have been detailed above; Similarly, concise mitigation measures relating to the protection of groundwater quality, quantity and the groundwater flow regime have been detailed above. Relevant mitigation measures are all of those described in the preceding sections for the construction phase. The Contractor will be legally required to adhere to the CEMP. Extensive monitoring will be undertaken to monitor water quality, identify potential effects, and take corrective action as necessary.		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM86	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Section 9	Mitigation by Design: The operational phase drainage system will be in place from the construction stage. Drainage from the operational site will comprise: › Runoff from individual turbine hardstanding areas will not be discharged into the existing drain network, but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; › Interceptor drains will be installed up-gradient of all proposed infrastructure within the Wind Farm Site 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 Wind Farm 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 where appropriate 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,		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Settlement ponds will be designed in consideration of the greenfield runoff rate.		
MM87	Wastewater	EIAR Section 9	**Mitigation Measures by Avoidance:** Wastewater will not be treated or disposed of onsite.		
MM88	WFD Water Body Status	EIAR Section 9	There is no direct discharge from the Proposed Development site to downstream receiving waters. Mitigation for the protection of surface water during the operational phase of the Proposed Development will ensure the qualitative status of the receiving waters will not be altered by the Proposed Development.		
Decommissioning Phase					
MM89	Decommissioning	EIAR Section 9	Upon decommissioning of the Wind Farm Site, the wind turbines will be disassembled in reverse order to how they were erected. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as silt laden run-off entering the receiving watercourses), erosion, dust, noise, traffic and an increased possibility of contamination of the local water table. There is no direct discharge from the Proposed Development site to downstream receiving waters. Mitigation for the protection of surface water during the decommissioning phase of the Proposed Development will ensure the qualitative status of the receiving waters will not be altered by the Proposed Development.		
Chapter 10 Air & Climate					
Construction Phase					
MM90	Exhaust Emissions	EIAR Section 10	› All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Turbines and construction materials will be transported to the Site on specified routes only, unless otherwise agreed with the Planning Authority. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Users of the Site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants is kept to a minimum. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Proposed Development 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 Proposed Development site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the Wind Farm Site is Ballydonagh Landfill which is located approximately 11.25km to the south-west of the Wind Farm Site. › Waste associated with the construction of the Grid Connection underground electrical cabling route will be disposed of at the closest MRF to where waste is generated along the underground electrical cabling route. There are two licensed waste facilities in the vicinity of the underground electrical cabling route, and these are the Ballydonagh Landfill as outlined above and the Derryclure Landfill which is located approximately 6.5km to the south of the Thornsberry 110kV substation at Tullamore.		
MM91	Dust Emissions	EIAR Section 10	› In periods of extended dry weather, dust suppression may be necessary along haul roads, site roads, and other infrastructure to		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Wind Farm Site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads, and site compounds to prevent the generation of dust where required. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas (on Site). › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › Turbines and construction materials will be transported to the Site on specified haul routes only. › The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The Site access roads will be checked weekly for damage/potholes and repaired as necessary. › The transport of construction materials to the Site that have significant potential to cause dust, will be undertaken in tarpaulin or similar covered vehicles where necessary. › The transportation of dry excavated material from the Site to the designated on-site spoil management areas, which may have potential to generate dust will be minimised. If necessary, excavated material will be dampened prior to transport to the spoil management areas. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-2). The CEMP includes dust suppression measures.		
MM92	Greenhouse Gas Emissions		› All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Turbines and construction materials will be transported to the Site on specified routes only unless otherwise agreed with the Planning Authority. › The majority of aggregate materials for the construction of the Proposed Development will be obtained from the local quarries. This will significantly reduce the number of delivery vehicles accessing the site and the length of such journeys, 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					
MM93	Exhaust Emissions	EIAR Section 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 on-site vehicles will be required to turn off engines.		
Decommissioning Phase					
MM94	Decommissioning Phase	EIAR Section 10	The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 11 Noise					
Pre-Commencement Phase					
MM95	Construction Noise	EIAR Section 11	Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern;		
Construction Phase					
MM96	Construction Noise	EIAR Section 11	Good site practices, both on the Wind Farm Site and along the Grid Connection underground electrical cabling route will be implemented to minimise the likely		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			effects. Particular care will be taken at watercourse, culvert and drain crossings along the underground electrical cabling route, where directional drilling activities are required to be undertaken. Section 8 of BS5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that will be employed onsite: › Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern; › All vehicles and mechanical plant will be fitted with effective exhaust silencers and be subject to programmed maintenance; › Select inherently quiet plant where appropriate - all major compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use; › All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers; › Machines will be shut down between work periods (or when not in use) or throttled down to a minimum; › Regularly maintain all equipment used on site, including maintenance related to noise emissions; › Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; and › All ancillary plant such as generators and pumps will be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures will be provided. Where the BS5228 threshold levels are anticipated to be exceeded due to directional drilling activities along the underground electrical cabling route, the following are examples of measures that will be considered, where necessary, to mitigate noise emissions from these activities are as follows:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from heras fencing or similar. Installation will be as close to the drilling rig as is practicable and fitted so as to interrupt any direct line of site between the drilling rig and the closest residential receptors. › Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc. It is anticipated that this will be required should directional drilling be used for water crossings 3, 7 and 11, which are in close proximity to sensitive receptors.		
Operational Phase					
MM97	Operational Phase Noise	EIAR Section 11	The predicted noise levels from the Proposed Development are within the Guidelines noise limits, and therefore no mitigation measures are required in respect of noise. Notwithstanding the above, this section discusses the principle of noise curtailment to demonstrate that all modern wind turbines have the capability of operating in reduced noise modes, should it be necessary to reduce the noise immissions from any installed turbine. Wind turbines can be programmed to run in reduced modes of operation (or low noise modes) in order to achieve noise criteria during certain periods (i.e. day or night) and under specific wind conditions (i.e. wind speed and direction). The turbine technology that has been assumed for this assessment offers various noise modes of operation which typically will have an associated energy output reduction. Operating the turbines in reduced modes is generally referred to as curtailment and is a proven effective mitigation to ensure noise limits are complied with. Low noise modes are available for all modern turbines likely to be considered for this Site.		
Decommissioning Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM98	Construction Noise	EIAR Section 11	Activities that occur during the decommissioning of the Proposed Development are unlikely to produce higher noise levels than those produced during construction and many of the activities will be similar in nature. As such it is considered that if construction noise levels are predicted to be below the threshold levels, then decommissioning noise will also be within the threshold levels.		
EIAR Chapter 12 Landscape & Visual					
Pre-Commencement, Construction and Operation					
MM99	Landscape Effects	EIAR Section 12	The following measures have been included in the Proposed Development design in order to avoid or reduce direct effects on landscape receptors of the Wind Farm Site: › The spatial configuration of the proposed infrastructure footprint has been carefully designed to minimise the loss of valuable landscape receptors on the Wind Farm Site, such as mature woodland, Annex1 habitats or features of cultural heritage value. › The internal site road layout makes use of the existing informal agricultural tracks wherever possible, to minimise the requirement for new tracks within the Wind Farm Site and where possible retain the integrity of existent field boundary walls, hedgerows and trees. › To minimise cut and fill activities required to construct the Proposed Development, the proposed access roads, and other infrastructure such as hard stands have been designed to align with the existing terrain within the landscape of the Wind Farm Site. › In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. › During initial vegetation stripping, all topsoil material will be temporarily stored on Wind Farm Site and used for “dressing” the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			edges of the development infrastructure during reinstatement/regrading, including that of the spoil management areas. This will be particularly important in areas of cut and fill. The stripped topsoil will contain a natural seed source of local provenance and result in the establishment of a species rich grassland.		
MM100	Landscape and Visual Effects	EIAR Section 12	The proposed onsite substation is sited in a location enclosed by vegetation, reducing visibility from receptors in the surrounding landscape to the south, east and west and north. Once established, the proposed treeline planting around the onsite substation will provide screening and mitigate visibility of the onsite substation.		
EIAR Chapter 13 Cultural Heritage					
Pre-Commencement					
MM101	Protected Structures		› Fencing off the structure 038-064 NIAH 15403808 Milestone at Ballinderry Big prior to construction. › Protective traffic barriers will be placed around the structure 031-019 NIAH 15403124 Water pump at Ballybrickoge during construction		
MM102	Features of Local Cultural Heritage Merit		An exclusion zone will be established around the Umma House and associated outbuildings prior to construction		
MM103	Sub-surface Archaeological Potential		› Pre-development archaeological testing of the proposed turbine bases, hardstands, proposed roads, compounds, substation site and any other Proposed Development components within the Wind Farm Site will be carried out under licence from the National Monuments Service. This is in order to identify any archaeological features at the earliest stage possible to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation).		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› A report on the testing will be compiled on completion of the work and submitted to the relevant authorities.		
Construction Phase					
MM104	Recorded Monuments and Protected Structures		› 30m buffer zones will be maintained around the monuments the details of which should appear in the CEMP. › No ground works or storage of materials or tracking of machinery will take place within the buffer zones › Archaeological Monitoring will be carried out along the relevant sections of the Grid Connection cabling route where the route traverses through the Zone of Archaeological Protection (ZAP). › A report on the monitoring should be compiled on completion of the work and submitted to the relevant authorities. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.		
MM105	Sub-surface Archaeological Potential		› Pre-development archaeological testing of the proposed turbine bases, hardstands, proposed roads, compounds, substation site and any other Proposed Development components within the Wind Farm Site will be carried out under licence from the National Monuments Service. This is in order to identify any archaeological features at the earliest stage possible to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation). › A report on the testing will be compiled on completion of the work and submitted to the relevant authorities. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › A report on the monitoring will be compiled on completion of the work and submitted to the relevant authorities. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring.		
Chapter 14 Material Assets					
Pre-Commencement, Construction and Operation					
MM106	Traffic & Transport	EIAR Section 14	Mitigation by design measures include the following; › Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles A detailed **Traffic Management Plan (TMP)**, incorporating all the mitigation measures set out in the CEMP included as Appendix 4-2 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site. Illustrations for the traffic arrangements and diversion routes identified for the Grid Connection works are included in Appendix 14-2: Grid Connection Traffic Arrangements and Diversion Routes, and identifies sections along the Grid Connection underground electrical cabling route where there will be road and pedestrian footpath closures, diverted traffic, and Stop/Go or traffic lights. The detailed TMP will include the following: **Traffic Management Coordinator –** a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Development and this person will be the main point of contact for all matters relating to traffic management.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Delivery Programme – a programme of deliveries will be submitted to Westmeath County Council and other relevant authorities in advance of deliveries of turbine components to the Wind Farm Site. Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse and An Garda Siochana, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Contract 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 –** A pre-condition survey of roads associated with the Proposed Development will be carried out prior to construction commencement to record the condition of the road. A post construction survey will be carried out after works are completed. Where required the timing of these surveys will be agreed with the local authority. **Implementation of temporary alterations to road network at critical junctions** – At locations where required highlighted in Section 14.1.8. **Identification of delivery routes** – These routes will be agreed and adhered to by all contractors. **Travel plan for construction workers to Wind Farm Site–** While the assessment above has assumed the worst case that construction workers will drive to the Wind Farm Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Travel plan for construction workers to underground electric cabling route – Due to the transient nature of the underground grid connection construction site which will generally be on a section of the public road, construction workers will be transported to and from the site by the construction company at the beginning and end of each shift. **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the access junction on the L5363. All measures will be in accordance with the *"Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works"* (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S). A member of construction staff (flagman) will be present at key junctions during peak delivery times. **Delivery times of large turbine components** - The management plan will include the delivery of large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. **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. **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
MM107	Telecommunications		Mitigation by design:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Vodafone responded to a scoping request from MKO on the 7th of May 2021, noting that they had links in the area. initial turbine locations were overlapping with the Vodafone link, therefore the turbine locations have been altered to ensure that no overlap or interference will occur.		
MM108	Existing Built Services		› 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.		
MM109	Traffic & Transport	EIAR Chapter 14	**Implementation of temporary alterations to road network at critical junctions** – At locations where required highlighted in Section 14.1.8 in Chapter 14.		
MM110	Telecommunications	EIAR Chapter 14	In the event of interference occurring to telecommunications, the Department of the Environment, Heritage and Local Government Wind Farm Planning Guidelines (2006) state that these effects can be dealt with by the use of divertor relay links out of line with the proposed wind turbines.		
MM111	Aviation	EIAR Chapter 14	The scoping response from the IAA set out lighting requirements for turbines as detailed above. These requirements will be complied with for the Proposed Development and any further details will be agreed in advance of construction with		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			the IAA i.e crane erection. The coordinates and elevations for built turbines will be supplied to the IAA, as is standard practice for wind farm developments.		
Decommissioning Phase					
MM112	Decommissioning	EIAR Section 14	In the event that the Proposed Development is decommissioned after the 30 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Section 4.11 of Chapter 4. A Decommissioning Plan has been prepared (Appendix 4-6) the detail of which will be agreed with the local authority prior to any decommissioning. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning.		

17.3 EIAR Monitoring Measures

Table 17-2 Monitoring Schedule

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Section 4 CEMP Section 4	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 An inspection and maintenance plan for the drainage system on site will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems 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 site ECoW or the Project Hydrologist.	On going	Monthly	Project Hydrologist
MX2	Tree Felling	EIAR Section 9 CEMP Section 3	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
MX3	Invasive Species	EIAR Section 6	A pre-commencement invasive species survey shall be completed for the site.	Once	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		CEMP Section 3				
MX4	Birds	EIAR Section 7	› Pre-construction surveys will be undertaken prior to the initiation of works at the Wind Farm Site. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If it is found to be active during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.	Once	As required	Project Ornithologist
Construction Phase						
MX5	Archaeological Monitoring	EIAR Section 13	› Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › Archaeological Monitoring will be carried out along the relevant sections of the Grid Connection cabling route where the route traverses through the Zone of Archaeological Protection › A report on the monitoring should be compiled on completion of the work and submitted to the relevant authorities. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may	As Required	As Required	Project Archaeologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			be required depending on the results of the monitoring.			
MX6	Water Quality and Monitoring	CEMP Section 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 contractor is solely responsible for the implementation of the detailed drainage design on site. The ECoW is responsible for monitoring the effectiveness of the drainage design as it is implemented on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the Proposed Development proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. 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 Development to ensure good performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.	Daily	As Necessary	ECoW
MX7	Water Quality and Monitoring	CEMP Section 4	› Daily general visual inspections of site operations and inspections of all watercourses 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,	Daily	As Necessary	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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). › Monthly site inspections by the Project Hydrologist/ ECoW during construction phase;			
MX8	Water Quality and Monitoring	EIAR Section 9	Daily surface water monitoring forms will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.	Daily	As Necessary	ECoW
MX9	Surface Water Quality	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. The baseline monitoring programme will be subject to agreement with Westmeath County Council.	As Required	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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 9-5 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 a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped and a geotechnical assessment undertaken.			
MX10	Tree Felling	EIAR Section 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 also 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

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX11	Plant and Equipment Inspections	EIAR Section 9 CEMP Section 4	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX12	Traffic and Transport	CEMP Section 3	The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the ECoW for cleanliness, and cleaned as necessary;	Daily	Monthly	ECoW
MX13	Flora and Fauna	CEMP Section 4	A Project Ecologist will be appointed. The responsibilities and duties of the Project Ecologist 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 Proposed Development area. › 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 onsite. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.	As required	As required	Project Ecologist
Operational Phase						

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX14	Surface Water Quality	CEMP Section 4	Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and,	Monthly	Monthly	ECoW
MX15	Drainage Inspections	CEMP Section 4	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
MX16	Ornithology	EIAR Section 7	The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the operational phase of the Proposed Development. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm. Monitoring measures are broadly based on guidelines issued by SNH (2009). The following individual components are proposed: › Vantage point surveys to monitor flight activity in the vicinity of the turbines; › Breeding walkover surveys to monitor breeding bird activity at the Wind Farm Site; › Collision monitoring, including carcass searches with trained dogs to monitor bird fatalities due to collision. These will include searcher efficiency and scavenger removal trails as a best practice measure.	Years 1, 2, 3, 5, 10, 15	Monthly	Project Ornithologist
MX17	Bats	EIAR Section 6	To assess the effects of the Proposed Development on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static	Years 1, 2, 3	Annually	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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. Results of Year 1 surveys will assess whether adaptations to the monitoring plan are required, and further mitigations such as curtailment will be considered. If a curtailment requirement is identified, a programme can 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 Wind Farm Site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. 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.			
MX18	Flora and Fauna	EIAR Section 6	To confirm that habitat restoration and enhancement has been successful, all areas of restored vegetation will be monitored post-restoration. This will be undertaken in partnership between the developer, the Project Ecologist and the Landowner. The proposed management actions will be conveyed to the developer	As required	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			and each of the landowners, and management alterations implemented as required to achieve the targets of the management plan. Hedgerows 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 shrubs 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 Environmental Report			
Decommissioning Phase						
MX19	Decommissioning	DP 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.	As required	As required	Site Manager
MX20	Decommissioning	DP Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of any material proposed for use as part of foundation backfilling.	As required	As required	Project Ecologist
MX21	Decommissioning	DP Section 7	Decommissioning monitoring surveys will be undertaken prior to works associated with decommissioning at the wind farm. The survey will include a thorough walkover survey to a 500m radius of the Proposed Development footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the decommissioning phase. If it is found to be active during the decommissioning phase, no works shall be undertaken within a	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			disturbance buffer (Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007) in line with industry best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.			