17. SCHEDULE OF MITIGATION AND MONITORING MEASURES

17.1 Introduction

All mitigation and monitoring measures relating to the pre-construction, 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 project are presented in Table 17-1 below. The mitigation measures have been grouped together according to their EIAR Chapter and project phases as follows:

- Pre-Construction Phase (Prior to the implementation of any groundworks)
- Construction Phase
- Operational Phase
- Decommissioning Phase

The mitigation measures in the below format provides an easy to audit list that can be reviewed and reported on during the future phases of the project. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-3 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during the course of future project 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 project are outlined in Table 17-2. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring measures are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring measures in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the project to ensure all the required monitoring is completed as required.

It is intended that the CEMP will be updated, where required, prior to the commencement of the construction phase of the Proposed Development to include all mitigation and monitoring , 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.

17.2 EIAR Mitigation Measures

Table 17-1 Schedule of Mitigation

Ref. MM 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 Chapter 4	All proposed activities on the site of the Proposed Development will be provided for in a Construction and Environmental Management Plan (CEMP), prepared prior to the commencement of any operations onsite. The CEMP will set out all measures necessary to ensure works are carried out in accordance with the mitigation measures set out in the EIAR and will set out the monitoring and inspections procedures and frequencies.		
		EIAR Chapter			
MM2	Environmental Management	CEMP Section 3	A Site ECoW will oversee the site works and implementation of the Construction Environmental Management Plan (CEMP) and provide on-site advice on the mitigation measures necessary as necessary to ensure the project proceeds as intended. 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 parties where required prior to commencement of construction, and may be further adjusted as required during the course of the project.		
MM3	Surface Water Quality	CEMP Section 4	Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement construction at the site. The baseline monitoring programme will be subject to agreement with Meath and Westmeath County Council.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Baseline laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards (EQSs) will also be undertaken as per water monitoring programme for the Proposed Development and each primary watercourse along the route.		
MM4	Concrete Deliveries	EIAR Chapter 4 CEMP Section 3	The arrangements for concrete deliveries to the site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures. Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching.		
MM5	Site Drainage Plan	CEMP Section 4	The Project Hydrologist will prepare detailed drainage design before construction commences.		
MM6	Preparative Site Drainage Management	EIAR Chapter 4 CEMP Section 4	The detailed drainage design will specify all materials and equipment necessary to implement the drainage measures effectively, which will be brought on site in advance of any works commencing. An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.		
MM7	Drainage Inspection	CEMP Section 3	Prior to commencement of works in sub-catchments across the site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.		
MM8	Drainage Maintenance	EIAR Chapter 4 CEMP Section 4	An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works. Regular inspections of installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system where it is not intended. The inspection of the drainage system will be the responsibility of the environmental clerk of works or the supervising hydrologist		
MM9	Earthworks	CEMP Section 3	Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible, drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.		
MM10	Peat Management	EIAR Chapter 4 CEMP Section 4	Prior to commencing floating and excavated road construction movement monitoring posts should be installed in areas where the peat depth is greater than 2.0m in locations recommended by the geotechnical engineer		
Construction Phase					
MM11	Wastewater Management	EIAR Chapter 4	The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. 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 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the site.		
MM12	Environmental Management	EIAR Chapter 4 CEMP Section 3	The Environmental Clerk of Works will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. In addition, an Environmental Clerk of Works or Project Ecologist, Project Hydrologist, Project Geotechnical engineer will visit the site regularly and report to the Site Environmental Office.		
MM13	Environmental Management	CEMP Section 3	A Site ECoW will oversee the site works and implementation of the Construction Environmental Management Plan (CEMP) and provide on-site advice on the mitigation measures necessary as necessary to ensure the project proceeds as intended. 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 parties where required prior to commencement of construction, and may be further adjusted as required during the course of the project.		
MM14	Refuelling	EIAR Chapter 4 CEMP Section 3	› Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling should occur at a controlled fuelling station; › On-site refuelling will take place using a mobile double skinned fuel bowser. The fuel bowser will be re-filled off site and will be towed by a 4x4 jeep to machinery is located. The 4x4 jeep will also carry fuel spill kits in the event of any spillages. The fuel bowser will be parked on a designated 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 and fuel absorbent mats will be used during all refuelling operations.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Fuel 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 electrical substation compound fuel storage area 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; › 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 developed Spill kits will be available to deal with any spillage in and outside the refuelling area.		
MM15	Concrete Deliveries and Management	EIAR Chapter 4 CEMP Section 3	The following mitigation measures are proposed to avoid release of cement leachate from the site: › No batching of wet-cement products will occur on site; › Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for culverts and concrete works will be used; › 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 chute cleaning will be permitted, 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. › Use weather forecasting to plan dry days for pouring concrete;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event; › The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a concrete washout area, typically built using straw bales and lined with an impermeable membrane. The areas are generally covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents is tankered off-site. Any solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste.		
MM16	Road Cleanliness	EIAR Chapter 4. CEMP Section 3	When necessary, sections of the haul route immediately outside the site entrances will be swept using a truck mounted vacuum sweeper.		
MM17	Water Discharge	EIAR Chapter 4	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		
MM18	Wastewater Management	EIAR Chapter 4. CEMP Section 3	Temporary toilets will be used during the construction phase as part of the welfare facilities for site staff and visitors. Wastewater from toilets will be directed to a sealed storage tank, with all wastewater tankered off site by an appropriately consented waste collector to wastewater treatment plants.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM19	Collector Drains	EIAR Chapter 4. EIAR Chapter 9	Swales will be used to intercept and collect run off from construction areas of the site during the construction phase, and channel it to settlement ponds for sediment attenuation as per the drainage design.		
MM20	Interceptor Drains	CEMP Section 3 EIAR Chapter 9	Interceptor drains will be installed up-gradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site. It will then be directed to areas where it can be re-distributed over the ground as sheet flow as per the drainage design.		
MM21	Check Dams	EIAR Chapter 4. EIAR Chapter 9	Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. Check dams may also be installed in some of the existing artificial drainage channels on the site, downstream of where drainage swales connect in. Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be installed at regular intervals along interceptor drains to restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam as per the drainage design.		
MM22	Level Spreaders,	CEMP Section 3 EIAR Chapter	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.		
MM23	Stilling Ponds	EIAR Chapter 4.	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,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		EIAR Chapter 9	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.		
MM24	Dewatering Silt Bag	CEMP Section 3 EIAR Chapter 9	Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the site.		
MM25	Siltbuster	EIAR Chapter 4. EIAR Chapter 9	Siltbuster type concrete was unit. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility.		
MM26	Culvert Upgrades	EIAR Chapter 4. EIAR Chapter 9	› All proposed new stream crossings will be bottomless or clear span culverts and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location;		
MM27	Silt Fences	CEMP Section 3 EIAR Chapter 9	› Silt fences will be placed within drains down-gradient of all construction areas. › They will remain in place throughout the entire construction phase. › Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. › The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects'		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			published by CIRIA (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		
MM28	Peat Management	EIAR Chapter 4 CEMP Section 3	› All excavated peat and non-peat will be placed/spread alongside the proposed infrastructure elements on site, where possible. › The peat and spoil placed adjacent to the proposed infrastructure elements should be restricted to a maximum height of 1m over a 10m wide corridor on both sides of the proposed infrastructure elements. It should be noted that the designer should define/confirm the maximum restricted height for the placed peat and spoil within the indicated parameters. › The placement of excavated peat and spoil is to be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the placement areas may require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works. › Where there is any doubt as to the stability of the peat surface then no excavated spoil shall be placed on to the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface. › Where practical, it should be ensured that the surface of the placed peat and spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the peat and spoil should be carried out as placement of peat and spoil within the placement area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed peat and spoil.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Finished/shaped side slopes in the placed peat and spoil shall be not greater than 1 (v): 2 (h) or 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat and spoil are encountered then slacker slopes will be required. › All placed spoil will be allowed to revegetate naturally from the extensive seed source of the plants that have already colonised in the area. Alternatively, if significant areas of bare spoil are still evident after a 3 year period and possibly in addition, seeding of the placed spoil could be carried out which would aid in stabilising the placed spoil in the long term. › Movement monitoring instrumentation may be required adjacent to the access road where peat has been placed. The locations where monitoring is required will be identified by the designer on site if required. › An interceptor drain should be installed upslope of the designated spoil placement areas to divert any surface water away from these areas. This will help ensure stability of the placed spoil and reduce the likelihood of debris run-off. All the above-mentioned general guidelines and requirements will be confirmed by the designer prior to construction.		
Operational Phase					
MM29	Wastewater Management	EIAR Chapter 4 EIAR Chapter 14	The removal and disposal of wastewater from the site will be carried out by a fully permitted waste collector holding valid Waste Collection Permits as issued under the Waste Management (Collection Permit) Regulations, 2007.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM30	Electrical Substation	CEMP Section 3	The electrical substation compound fuel storage area 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;		
MM31	Drainage Inspection	EIAR Chapter 4 4	The frequency of drainage system inspections will be reduced following completion of the construction phase of the project. Inspections will be reduced to monthly, twice monthly and eventually quarterly during the operational phase. The frequency will be increased or decreased depending on the effectiveness of the measures in place and the amount of remedial action required in any given period.		
Decommissioning Phase					
MM32	Decommissioning	EIAR Chapter 4	Prior to the end of the operational period the Decommissioning Plan (Appendix 4-5 of the EIAR) will be updated in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time.		
MM33	Decommissioning	DP Section 2	On removal of turbines, turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate		
MM34	Decommissioning	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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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 EIAR Chapter 4). 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.		
MM35	Decommissioning	DP Section 3	› Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions. › The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the Site Manager for cleanliness and cleaned as necessary. › Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind. › Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. › The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary. › All site related traffic will have speed restrictions on un-surfaced roads to 15 kph. › Daily inspection of the site to examine dust measures and their effectiveness. › When necessary, local sections of the public roads being used will be swept using a truck mounted vacuum sweeper.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM36	Decommissioning	DP Section 3	› Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts. › Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All plant and equipment to be used on-site will be modern equipment and will comply with the S.I. No. 359/1996 - European Communities (Construction Plant and Equipment) (Permissible Noise Levels) (Amendment) Regulations. › Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works. › Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machines, which are used intermittently, will be shut down during those periods when they are not in use. › Training will be provided by the Site Manager to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and, › Local areas of the public road networking being used will be condition monitored and maintained, if necessary.		
MM37	Decommissioning	EIAR Chapter 4	Site roadways will be in use as amenity and recreational pathways, and therefore will not be removed during decommissioning. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Chapter 5: Population and Human Health					
Pre-Construction Phase					
MM38	Traffic and Transport	EIAR Chapter 5	Prior to commencement of any ground works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
Construction Phase					
MM39	(Human Health) Health and Safety	EIAR Chapter 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. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM40	Human Health (Noise)	EIAR Chapter 5	› No plant used on site will be permitted to cause an on-going public nuisance due to noise. › The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. › Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Chapter 11 using methods outlined in British Standard BS 5228-1:2014+A1:2019 Code of practice for noise and vibration control on construction and open sites – Noise. › The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e., concrete pours, large turbine component delivery, rotor/blade lifting) it could occasionally be necessary to work out of these hours.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Operational Phase		
MM41	(Human Health) Health and Safety	EIAR Chapter 5	Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. Signs will be erected at suitable locations such as, amenity access points and carparks, setting out the conditions of public access under the relevant legislation and providing normal hours (and out of hours) contact details. Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. Signs will also be erected at suitable locations across the site as required for the ease and safety of operation of the wind farm. These signs include: › Buried cable route markers at 50m (maximum) intervals and change of cable route direction; › Directions to relevant turbines at junctions; › "No access to Unauthorised Personnel" at appropriate locations; › Speed limits signs at site entrance and junctions; › "Warning these Premises are alarmed" at appropriate locations; › "Danger HV" at appropriate locations; › "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at site entrance; › "No unauthorised vehicles beyond this point" at specific site entrances; and › Other operational signage required as per site-specific hazards. An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the site. Access for emergency services will be available at all times.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM42	Shadow Flicker	EIAR Chapter 5	Where daily shadow flicker exceedances have been predicted at buildings by the modelling software, a site visit will be undertaken firstly to determine the level of occurrence, existing screening and window orientation. **Screening Measures** In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at a residential receptor, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation; › Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator. **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. The wind farm's SCADA control system can be programmed to shut down any particular turbine at any particular time on any given day to ensure that shadow flickers occurrences at properties which are not naturally screened or cannot be screened with measures outlined above		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Chapter 6: Biodiversity					
Pre-Construction Phase					
MM43	Invasive Species Management	EIAR Chapter 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. If the presence of such species is found at or adjacent to the site, particularly in areas where its excavation may be required, an invasive species management plan will be prepared for the site to prevent the introduction or spread of any invasive species within the footprint of the works.		
MM44	Fauna	EIAR Chapter 6	› A pre-construction badger survey will be undertaken at the location of the identified setts at Carranstown Bog by a qualified ecologist prior to the commencement of any works to determine if the setts are in use and to identify any additional sett entrances that may have been excavated in the intervening period. › The outlier sett within the footprint of the proposed substation will be monitored for 2 weeks prior to construction using a camera trap to determine if it is in use. › If the outlier sett in the construction footprint is found to be in use exclusion measures will be put in place prior to construction in line with NRA Guidelines to ensure that the sett is evacuated. › As per NRA guidelines exclusion from an active sett will only be carried out during the period of July to November inclusive in order to avoid the badger breeding season. › During the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts or pile driving within 150m of active setts.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Exclusion zone fencing and appropriate signage will be put in place around the main sett to the south of the substation which lies outside the construction footprint. This will ensure that there will be no vehicles tracking in the area and no temporary storage of construction materials that could impact the sett.		
MM45	Bats	EIAR Chapter 6 Appendix 6-2	In accordance with NatureScot (2021) and the Northern Ireland Environment Agency (NIEA) Guidance (2021), a minimum 50m buffer to all habitat features used by bats should be applied to the siting of all wind turbines. This 50m buffer will be implemented from the outset and monitored as per the post construction monitoring		
Construction Phase					
MM46	Flora & Fauna	EIAR Chapter 6 Appendix 6-2	Noise Restriction › During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001). Lighting Restriction 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 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK. In addition, the applicant commits to the use of lights during construction (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations: › Every light needs to be justifiable, › Limit the use of light to when it is needed, › Direct the light to where it is needed, › Reduce the light intensity to the minimum needed, › Use light spectra adapted to the environment, When using white light, use sources with a "warm" colour temperature (less than 3000K).		
MM47	Aquatic Faunal Species	EIAR Chapter 6	While there will be no requirement for instream works, all works adjacent to watercourses, will adhere to Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).		
MM48	Flora & Fauna	EIAR Chapter 6	While no significant effects are anticipated as a result of the loss of these habitats these linear features will be fully re-instated by replanting of the same lengths of hedgerow and treeline at the locations where they were lost following the completion of works. Planting will comprise native species.		
MM49	Invasive Species	EIAR Chapter 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:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	› A risk assessment and method statement must be provided by the Contractor prior to commencing works. › Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected. › A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface. › Stockpile areas will be chosen to minimise movement of contaminated soil. › Stockpiles will be marked and isolated. › Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore. › The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material. › An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans. Plant and equipment which is operated within an area for the management of materials in contaminated areas 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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.		
MM50	Flora and Fauna	EIAR Chapter 6	The Proposed Development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management (as described in the Biodiversity and Enhancement Management Plan) that will be implemented during the construction phase of the Proposed Development and maintained during the operational phase. Details of the management that will be undertaken are provided in the Biodiversity and Enhancement Management Plan in Appendix 6-5 of the EIAR. These include: › Drain Blocking › Vegetation Monitoring › Planting of Native Woodland › Hydrological Monitoring In addition to the above, during construction activities on this habitat, the works area will be fenced off to prevent encroachment onto areas of habitat outside the development footprint.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Operational Phase		
MM51	Bats	EIAR Chapter 6 Appendix 6-2	As per the bat survey report in Appendix 6-2, in accordance with NatureScot (2021) and the Northern Ireland Environment Agency (NIEA) Guidance (2021), a minimum 50m buffer to all habitat features used by bats should be applied to the siting of all wind turbines. Eurobats No. 6 guidance and NIEA (2021) recommends increased buffers around woodland/forestry areas. All habitat suitable for foraging and commuting bats has been identified as linear scrub features which developed along cutover bog drains. NatureScot recommends that a distance of 50m between turbine blade tip and nearest scrub habitat is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post construction monitoring. Where possible, the proposed location of turbines has accounted for the least possible loss of scrub and woodland habitat as it provides suitable habitat for other species. Where linear scrub features are located at the edge of the felling buffers, the option to maintain the features has been considered. All buffer zones will be maintained vegetation-free for the duration of the project. The success of the buffer mitigation will be assessed as part of post construction monitoring and updated where necessary. Blade feathering NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine (i.e. 3.5 m/s).		
Decommissioning Phase					
MM52	Decommissioning	EIAR Chapter 6	The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. An outline decommissioning plan is contained in the CEMP, Appendix 4-3 of the EIAR. The CEMP for the project provides the details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the proposed wind farm.		
Chapter 7 Birds (Appendix 7-1)					
Pre- Construction Phase					
MM53	Birds	EIAR Chapter 7	The project design has followed the basic principles outlined below to eliminate the potential for significant effects on avian receptors: › The Proposed Development avoids wildlife refuge sites (e.g. waterbodies)		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Hard standing areas have been designed to the minimum size necessary to minimise habitat loss.		
MM54	Birds	EIAR Chapter 7	› A Construction and Environmental Management Plan (CEMP, Appendix 4-3) has been prepared. The CEMP will be in effect prior to the start of the construction phase. Best practice measures which form part of the design of the project are included in Chapter 4 of the EIAR. The CEMP is included as an Appendix to Chapter 4. › Construction works will begin outside the bird nesting season as defined by the Wildlife Act 1976 as amended (1st of March to the 31st of August). › All removal of woody vegetation will be undertaken in accordance with Section 40 of the Wildlife Act 1976 as amended.		
Construction Phase					
MM55	Birds	EIAR Chapter 7	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. Plant machinery will be turned off when not in use.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			All plant and equipment for use will comply with the European Communities (Noise Emission by Equipment For Use Outdoors) Regulations, 2001 (S.I. No. 632/2001) and other relevant legislation. An Ecological Clerk of Works (ECoW) will be appointed. Duties will include: › Oversee a pre-construction transect/walkover bird survey is undertaken, to avoid significant effects on breeding birds will be avoided. › Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Application Site. › Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise. › Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.		
MM56	Removal of Vegetation	EIAR Chapter 4	The commencement of works where the removal of vegetation is required, or where works take place in sensitive breeding habitats (such as birch scrub and emergent wetland vegetation), will be scheduled to occur outside the bird breeding season (1st of March to 31st of August) to avoid any potentially significant effects on nesting birds.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Operational Phase					
MM57	Birds	EIAR Chapter 7	No operational phase impacts requiring mitigation were identified. However, monitoring in line with best practice is proposed. Refer to MX19		
Decommissioning Phase					
MM58	Birds	EIAR Chapter 7	During the decommissioning phase, disturbance limitation measures will be as per the construction phase described.		
EIAR Chapter 8 Land Soils & Geology					
Pre- Construction Phase					
MM59	Peat & Subsoil Excavation	EIAR Chapter 8	› The Proposed Development has been designed to avoid sensitive habitats within the application area; ○ Placement of turbines and associated infrastructure in areas with shallower peat where constraints allow; ○ Use of floating roads, where appropriate, to reduce peat excavation volumes.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Construction Phase					
MM60	Excavation of Borrow Pits	EIAR Chapter 8	Upon the removal of the required volumes of granular material (for the construction of the infrastructure elements at the wind farm) from the borrow pits it is proposed to reinstate the pits using excavated peat and spoil. The borrow pits are designed and will be constructed in a way which will allow the excavated peat and spoil to be placed safely, with areas within the borrow pits designated for the storage of excavated peat. Other mitigation measures included in the design of the borrow pits are as follows: › Borrow pits will be developed with stable ground inclinations; › Exposed slopes will be left with irregular faces to promote re-vegetation; › Where possible segments of granular material will be left in places to help retain placed peat and spoil. Where this is not possible buttresses of permeable fill may be constructed to provide sufficient stability to the placed peat; and, › Infilling of peat should commence at the back of the borrow pit and progress towards the pit entrance.		
MM61	Peat & Subsoil Excavation	EIAR Chapter 8	› A minimal volume of peat and subsoil will be removed to allow for infrastructural work to take place in comparison to the total volume present on the site due to optimisation of the layout by mitigation by design; › The peat and subsoil which will be removed during the construction phase will be localised to the wind farm infrastructure turbine location, substation and temporary compounds and access roads; › Excavated peat that is not used locally for landscaping will be stored in the 3 no. borrow pits; and		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Construction of settlement ponds will be volume neutral, and all excess material will be used locally to form pond bunds and surrounding landscaping. › In general, excavated peat will be moved short distances from the point of excavation and used locally for landscaping;		
MM62	Contamination of Soil	EIAR Chapter 8	› On-site re-fuelling will be undertaken using a double skinned bowser with spill kits kept on site for accidental leakages or spillages; › Only designated trained operatives will be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › Fuels volumes stored on-site will be minimised. All storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; › Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and › An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (which is contained in Appendix 4-3)		
MM63	Erosion	EIAR Chapter 8	› All works will be completed in accordance with the Peat and Spoil Management Plan (FTC, 2023)		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All excavated peat and spoil shall be transported immediately on excavation to designated peat storage areas along the access roads and will be used on site for landscaping close to the extraction area; › Where peat/spoil is not used to landscaping it will be transported immediately to one of the proposed borrow pits; › Peat and spoil will not be transported significant distances upon excavation; › Upon excavation, the upper vegetative layer (where still present) will be stored with the vegetation part of the sod facing the right way up to keep the plants and vegetation alive to aid construction reinstatement of disturbed ground; › Re-seeding and spreading/planting will also be carried out in areas where ground will be disturbed; and, › A full Peat and Spoil Management Plan for the development is shown as Appendix 4-2.		
MM64	Peat Instability	EIAR Chapter 8	The following mitigation measures will be adhered to during the construction phase to minimise the risks of peat instability and failure: › Appointment of experienced and competent contractors; › The site will be supervised by experienced and qualified personnel; › Allocate sufficient time for the project (decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); › Prevent undercutting of slopes and unsupported excavations; › Maintain a managed robust drainage system; › Prevent placement of loads/overburden on marginal ground; › Set up, maintain and report findings from monitoring systems (as detailed in the Geotechnical and Peat Stability Assessment); › Ensure construction method statements are finalised and implemented prior to the commencement of construction (these construction method		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			statements will align with the mitigation measures outlined in this EIAR and the CEMP); and, › Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.		
MM65	Pilling Works	EIAR Chapter 8	Other than surface level and minor excavation works, any driven piles will not produce significant volumes of spoil, these will displace soil/subsoil within the ground. The bored pile option could produce between 320 to 580m^3 of spoil material per turbine base. Excess spoil will be removed for permanent storage in the on-site borrow pits. Bored pile spoil volumes only amount to between ~1 to 2% of the overall peat and spoil volumes for the Proposed Development.		
Operational Phase					
MM66	Site Road Maintenance	EIAR Chapter 8	Use of aggregate from authorised quarries for use in road and hardstand maintenance		
MM67	Site Vehicle/Plant use	EIAR Chapter 8	› Vehicles used during the operational phase will be refuelled off site before entering the proposed site; › No fuels will be stored on-site during the operational phase; and		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and, › An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be contained in the finalised Environmental Management Plan.		
MM68	Oils in Substation and Turbine Transformers	EIAR Chapter 8	› The electrical control building (at the substation) will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › All transformer areas at the turbines will be bunded to 110% of the volume of oil used in each transformer; › An emergency plan for the operational phase to deal with accidental spillages will be contained in the Environmental Management Plan		
Decommissioning Phase					
MM69	Decommissioning Phase	EIAR Chapter 8	Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 9 Hydrology					
Pre- Construction Phase					
MM70	Earthworks	EIAR Chapter 9	Mitigation by Avoidance: The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses, and 10m to main drains). All of the key Proposed Development areas (turbines, hardstands, substation, construction compounds etc.) are located significantly away from the delineated 50m watercourse buffer zones except for the upgrading of the existing watercourse crossings, new drain crossings and upgrades to the existing site access tracks. The Proposed Development includes upgrades to existing watercourse crossings and site access roads and a new proposed amenity path which cross EPA mapped watercourses at 3 no. locations within the proposed site: › Upgrades to the existing crossing over the Killanconnigan stream between Ballivor and Carranstown bogs; › Upgrades to the existing crossing over the Cartenstown stream between Bracklin and Lisclogher bogs; › Proposed amenity path over the Cartenstown stream in the centre of Lisclogher bog. However as stated above in Section **Error! Reference source not found.**, walkover surveys have confirmed that there is no watercourse in this area of the proposed site). The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be installed and operate effectively. The proposed buffer zone will: › Minimise physical damage (river/stream banks and river/stream beds) to watercourses (where possible, this cannot be avoided at the		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			watercourse crossing discussed above) and the associated release of sediment; › Minimise excavations within close proximity to surface watercourses; › Minimise the entry of suspended sediment from earthworks into watercourses; and, › Minimise 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. Mitigation by Design: There is an extensive network of drains already existing at the 4 no. bogs comprising the proposed site. The existing drainage infrastructure is operating in accordance with IPC licence requirements, with environmental monitoring and silt control measures being implemented at these bogs. The existing drainage system at the proposed site will be maintained and expanded locally as required for use within the Proposed Development drainage system. The key elements are the upgrading and improvements to water treatment elements, such as in-line controls and treatment systems, including wind farm related silt traps and settlement ponds. The elements of interaction with existing drains will be as follows: › Interceptor drains will convey clean runoff water around works areas to the existing downstream drainage system (field drains and main drains). Where required, interceptor drains will be installed in advance of any construction works commencing. This will ensure that clean water is kept clear by diverting surface water flow around excavations, construction areas and temporary storage areas. Where possible (depending on orientation), existing field drains can be used as interceptors drains;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Collector drains will be used to intercept and collect runoff from construction areas (from turbine base/hardstand areas, construction compounds, and the substation). During the construction phase temporary settlement ponds will be used to attenuate and treat runoff from the construction areas (from turbine base/hardstand areas, construction compounds, and the substation) and treated water will then discharge into existing field drains and main drains. Temporary settlement ponds will be removed at the end of the construction phase (end of high risk period), and wind farm runoff will discharge into existing field drains and main drains; › During the construction phase, temporary silt traps (silt fences) will be used as an additional water protection measures around the existing bog drainage network, particularly where works are proposed within 50m of a natural watercourse. The silt fences will be placed in the existing drains downstream of construction works, and the associated construction area run-off water will be diverted into proposed interceptor drains, or culverted under/across the works area; › During the construction phase, dewatering silt bags will also be used as required. They can be used downgradient of turbine bases, where temporary pumping is required. Discharge from dewatering silt bags will flow into settlement ponds and treated water from settlement ponds will outfall to existing field drains and main drains; › Within the proposed site layout there are section of proposed floating road between turbine infrastructure. In these sections, and depending on intermediate topography, a collector drain (dirty water system as described above) may be used during construction stage, or over the edge (OTE) drainage will occur. Over the edge drainage allows runoff from access tracks to flow into local field drains and be managed via the existing site drainage system. OTE drainage will only occur where topography allows, and it is only proposed in areas of low risk and remote from outfall locations (at least 150m from bog outfall locations.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Silt traps and check dams will be installed in field drains downstream of OTE drainage areas, and these will provide attenuation and treatment of dirty water; and, › Culverts will be required where site roads and proposed hardstands cross the main bog drainage networks. These will be installed with a minimum gradient to reduce the entrainment of suspended solids. All culverts will be inspected regularly and maintained where appropriate. Culverts will remain in-situ during the Operational Phase of the Proposed Development.		
MM71	Drainage & Water Quality	EIAR Chapter 9	An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works and will be included in the CEMP. Regular inspections of all installed drainage systems will be undertaken, especially before and after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.		
Construction Phase					
MM72	Water Treatment Train	EIAR Chapter 9	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 system) will be used to filter and treat all required surface discharge water collected in the dirty water drainage system. This will apply to all of the construction phase.		
MM73	Silt Fences	EIAR Chapter 9	Silt fences will be located within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the existing drainage network of sand and gravel-sized sediment, released from the excavation of mineral sub-soils of glacial and glacio-fluvial origin and entrained in surface water runoff. Regular inspection and maintenance of silt fences during the construction phase are critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM74	Silt Bags	EIAR Chapter 9	Silt bags will be used where small to medium volumes of water need to be pumped from excavations (e.g. the proposed underpass locations). As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through.		
MM75	Weather Management	EIAR Chapter 9	The works programme for the construction stage of the development will also take account of weather forecasts and predicted heavy rainfall events in particular. Large excavations and movements of peat/subsoil or peat stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily/weekly basis, as required, to allow site staff to manage construction activities: › General Forecasts: Available on a national, regional and county level from the Met Éireann website (www.met.ie/forecasts). These provide general information on weather forecasts 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 Éireann 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,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide an interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold of rainfall values given below will allow planned works to be safely executed (from a water quality perspective) or works to be postponed if a high rainfall intensity event is forecast. Earthworks will be suspended if forecasting predicts any of the following is likely to occur: › >10 mm/hr (i.e. high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. Prior to earthworks being suspended the following further control measures will be completed: › All open peat/spoil excavations will be secured and sealed; › Temporary or emergency drainage will be created to prevent back-up of surface runoff; and, › Working during heavy rainfall and for up to 24 hours after heavy events will not be allowed to ensure drainage systems are not overloaded.		
MM76	Runoff	EIAR Chapter 9	It is proposed that excavated peat will be used for landscaping close to its original extraction point. During the initial placement of peat and subsoil, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from the storage areas as required. Interceptor and collector drains will be used at storage areas. 'Siltbuster' treatment trains will be employed if previous treatment is not of a high quality.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM77	Timing of Construction Works	EIAR Chapter 9	Construction of the 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 low rainfall periods will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.		
MM78	Surface Water Management	EIAR Chapter 9 CEMP Section 4	During the construction phase field testing (visual, supplemented with pH, electrical conductivity, temperature, dissolved oxygen and turbidity monitoring), sampling and laboratory analysis of a range of parameters[1] with relevant regulatory limits and EQSs will be undertaken for each primary watercourse, and specifically following heavy rainfall events (i.e. weekly, monthly and event-based). The data will be processed and analysed and works will cease if elevated turbidity concentrations are recorded. In this event, all upstream silt traps and drainage routes will be inspected to identify the cause of the elevated turbidity levels. Works will not recommence until any issues have been resolved and the turbidity concentrations have returned to background concentrations		
MM79	Drainage Maintenance & Water Quality	EIAR Chapter 9	Any excess build-up of silt sediment levels at dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. During the construction phase field testing (visual, supplemented with pH, electrical conductivity, temperature, dissolved oxygen and turbidity monitoring), sampling and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken for each primary watercourse, and specifically following heavy		

[1] *example suite: pH (field measured), Electrical Conductivity (field measured), temperature (field measured), Dissolved Oxygen (field measured), Turbidity (NTU) (sonde measured), Flow (m/s), Total Suspended Solids (mg/l), Ammonia, Nitrite (NO_2) (mg/l), Ortho-Phosphate (P) (mg/l), Nitrate (NO_3) (mg/l), Phosphorus (unfiltered) (mg/l), Chloride (mg/l), and BOD (mg/l).*

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			rainfall events (i.e. weekly, monthly and event-based). The data will be processed and analysed and works will cease if elevated turbidity concentrations are recorded. In this event, all upstream silt traps and drainage routes will be inspected to identify the cause of the elevated turbidity levels. Works will not recommence until any issues have been resolved and the turbidity concentrations have returned to background concentrations.		
MM80	Excavation Dewatering	EIAR Chapter 9	Management of excavation seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; › If required, pumping of excavation inflows will prevent the build-up of groundwater in the excavation; › The interceptor drainage will be discharged to the existing drainage system or onto the bog surface within the overall bog drainage and treatment system; › 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 the existing bog drainage network and therefore no risk of hydraulic loading or contamination will occur; and, › Daily monitoring of excavations and the water treatment system by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped, and a geotechnical assessment will be undertaken.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM81	Piling Works	EIAR Chapter 9	Proposed mitigation measures relative to piling works will comprise: › Where driven piles are used, they will have a cross section without re-entrant angles; › Strict QA/QC procedures for piling works will be followed; › Piles will be kept vertical during piling works; › Good workmanship will be employed during all piling works; and, › Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater.		
MM82	Hydrocarbons	EIAR Chapter 9	› All plant will be inspected and certified to ensure they are leak free and in good working order prior to use on site; › On-site 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 or truck will be re-filled off site and will be towed/driven around the proposed site to where machinery is located. The 4x4 jeep/fuel truck will also carry fuel absorbent materials for the event of any accidental spillages. The fuel bowser will be parked in a designated location on a level area in the 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 available during all refuelling operations and used when required; › Fuel volumes stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume during the construction phase; › An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (Appendix 4-3). Spill kits will be available to deal with accidental spillages.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM83	Release of Cement Based Products	EIAR Chapter 9	Mitigation by Avoidance: › No batching of wet-cement products on-site is proposed. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will be the design approach; › Where possible pre-cast elements for culverts and concrete works will be used; › No washing out of the main body of any plant used in concrete transport or concreting operations will be allowed on-site; › Where concrete is delivered on site, only the concrete truck chute will 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 will be isolated in temporary lined wash-out pits located near proposed site compounds. These temporary lined wash-out pits will be removed from the site their utility is no longer required or at the end of the construction phase; › Any washing out of concrete pumping plant will also be into the temporary lined wash-out pits. › Weather forecasts will be used to plan dry days for pouring concrete; and, › Construction contractors will ensure each concrete pour site is free of standing water and plastic covers will be available in case of a sudden rainfall event.		
MM84	Groundwater and Surface Water Contamination	EIAR Chapter 9	› There are a total of 4 no. proposed construction compounds associated with the Proposed Development; › During the construction phase, self-contained port-a-loo with an integrated waste holding tank will be used at each of the site		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	from Wastewater Disposal		compounds, maintained by the providing contractor, and removed from the site on completion of the construction works; › Water supply for the site office and other sanitation will be brought to site and removed after use by a licensed contractor to be discharged at a suitable off-site treatment location; and, › No water or wastewater will be sourced on the site, nor discharged to the site.		
MM85	Transport Delivery Route	EIAR Chapter 9	Mitigation by Avoidance: A constraint/buffer zone will be maintained for all upgrade works locations where possible. In addition, measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse. The purpose of the constraint zone is to: › Avoid physical damage to surface water channels; › Provide a buffer against hydraulic loading by additional surface water run-off; › Avoid the entry of suspended sediment and associated nutrients into surface waters from excavation and earthworks; › Provide a buffer against direct pollution of surface waters by pollutants such as hydrocarbons; and, › Provide a buffer against construction plant and materials entering any watercourse. General Best Practice Pollution Prevention Measures will also include:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› No stock-piling of construction materials will take place within environmental buffer zones. No refuelling of machinery or overnight parking of machinery is permitted in this area; › No concrete truck chute cleaning is permitted in this area; › Works shall not take place at periods of high rainfall, and shall be scaled back or suspended if heavy rain is forecast; › Plant will travel slowly across bare ground at a maximum of 5km/hr. › Machinery deliveries shall be arranged using existing structures along the public road; › All machinery operations shall take place away from the stream and ditch banks, although no instream works are proposed or will occur; › Any excess construction material shall be immediately removed from the area and taken to a licensed waste facility or the on-site spoil management areas; › No stockpiling of materials will be permitted in the constraint zones; › Spill kits shall be available in each item of plant required; and, › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. Mitigation Measures relating to the use and storage of fuels and chemicals in terms of groundwater protection: › Onsite re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser, as described in Section **Error! Reference source not found.**. No maintenance of construction vehicles or plant will take place along the temporary junction works areas; › The plant used will be regularly inspected for leaks and fitness for purpose; and, › Spill kits will be available to deal with accidental spillage.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Operational Phase		
MM86	Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Chapter 9	As part of the Proposed Developments drainage design, it is proposed that runoff from the proposed infrastructure will be collected locally in new proposed silt traps, settlement ponds and vegetated buffer areas prior to release into the existing bog drainage network. The new proposed drainage measures will then create significant additional attenuation to what is already present. The operational phase drainage system will be installed and constructed in conjunction with the existing bog drainage network and will include the following mitigation measures: › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed into downstream field drains; › Collector drains will be used to gather runoff from access roads and turbine hardstanding areas of the site likely to have entrained suspended sediment, and channel it to new local settlement ponds for sediment settling; › On 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/roadside drains; › Check dams will be used along sections of access road drains to intercept silt at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of access road 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 existing drains;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Settlement ponds will be designed in consideration of the greenfield runoff rate, existing bog settlement ponds will also buffer discharges from the bogs; and, › Finally, all surface water runoff from the development will pass through the existing settlement ponds at the existing bog outfall locations.		
MM87	Wastewater	EIAR Chapter 9	It is proposed to install a sealed underground holding tank for effluent (wastewater) from the substation building. The tank shall be routinely emptied by a licensed contractor. A level sensor will be installed in the tank which shall be linked to the on-site SCADA system. If the level of the tank contents rise to a predetermined 'high' level a warning shall appear on the overall SCADA system for the site and automatic notification shall be sent to the facility manager. A formal service agreement will be entered into with a suitably permitted waste contractor, in relation to the servicing and de-sludging of the wastewater holding tank on site.		
Decommissioning Phase					
MM88	Decommissioning	EIAR Chapter 9	During decommissioning, it will be possible to reverse or at least reduce some of the potential effects caused during construction, and to a lesser extent operation, by rehabilitating constructed areas such as turbine bases and hardstanding areas. This will be done by re-establishing vegetation, thereby reducing runoff and sediment loads. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
Chapter 10 Air & Climate					
Construction Phase					
MM89	Exhaust Emissions Greenhouse Gas Emissions	EIAR Chapter 10	Exhaust Emissions during construction of turbine and other infrastructure: › Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			inspection and machinery checklist which will be followed and updated if/when required. › Machinery will be switched off when not in use. › Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 14 Material Assets for details. › Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3). The CEMP includes dust suppression measures. Borrow Pits: › Measures pertaining to exhaust emissions from turbine and other infrastructure construction will be implemented for the construction of the borrow pits. › Sporadic wetting of loose stone surface in the borrow pits will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compound 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). › Wheel wash bays will be located at both the main site entrances into Ballivor Bog and Carranstown Bog off the R156. All vehicles		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			will go through the wheel wash prior to exiting the site to ensure no materials are carried onto the local road network. › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › The transport of construction materials from the borrow pits around the site will be undertaken in tarpaulin or similar covered vehicles, where necessary. Transportation of Materials to site: › Measures listed in the section above pertaining to exhaust emissions from turbine, other infrastructure and borrow pit construction will be implemented for the transportation of vehicles to and from the Wind Farm Site. › Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions. › 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.		
MM90	Dust Emissions Greenhouse Gas Emissions	EIAR Chapter 10	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compound to prevent the generation of dust where required. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All plant and materials vehicles shall be stored in dedicated areas (on site). › Wheel wash bays will be located at both the main site entrances into Ballivor Bog and Carranstown Bog off the R156. All vehicles will go through the wheel wash prior to exiting the site to ensure no materials are carried onto the local road network. › 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 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. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3). The CEMP includes dust suppression measures. › Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › The transport of construction materials from the borrow pits around the site will be undertaken in tarpaulin or similar covered vehicles, where necessary. › Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced or onsite where possible, which will further reduce potential emissions.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Operational Phase					
MM91	Exhaust, Dust and Greenhouse Gas Emissions	EIAR Chapter 10	› Maintenance vehicles brought onsite during the operational phase will be maintained in good operational order, thereby minimising any emissions that arise. › Amenity carparks are spread out throughout the Wind Farm Site thus minimising the potential for traffic delays due to congestion building up at site entrance points and consequently further exhaust emissions		
Decommissioning Phase					
MM92	Decommissioning Phase	EIAR Chapter 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- Construction Phase					
MM93	Construction Noise	EIAR Chapter 11	Local residents will be kept informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern;		
Construction Phase					
MM94	Construction Noise	EIAR Chapter 11	Good site practices will be implemented to minimise the likely effects. Section 8 of BS5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that will be employed onsite: › Local residents will be kept informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern; › No plant used on site will be permitted to cause an on-going public nuisance due to noise.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machinery that is used intermittently will be shut down during periods when not in use. › Any plant, such as generators or pumps, which is required to operate close to NSL's outside of general construction hours will be surrounded by an acoustic enclosure or portable screen. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Section 11.3.2 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*. › The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Friday and 7:00hrs to 1400hrs Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, rotor/tower deliveries) it will be necessary on occasion to work outside of these hours.		
Operational Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM95	Operational Phase Noise	EIAR Chapter 11	An assessment of the operational noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section **Error! Reference source not found.** of this Chapter. The findings of the assessment, presented in Section **Error! Reference source not found.** confirms that the predicted operational noise levels will be within the relevant best practice noise criteria curves for wind farms at all locations. In the unlikely event that an issue with low frequency noise is associated with the Proposed Development, an appropriate detailed investigation will be undertaken. Due consideration will be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document entitled *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) (EPA, 2016). This guidance is based on the threshold values outlined in the Salford University document *Procedure for the assessment of low frequency noise complaints, Revision 1, December 2011*. If an exceedance of the threshold values is confirmed, measures to mitigate low frequency noise at noise-sensitive locations will be implemented through operational controls for the relevant turbine type, which may include turbine curtailment and/or stopping turbines under specific operational conditions. In the event that a confirmed complaint is received which indicates potential amplitude modulation (AM) associated with turbine operation, the operator will employ an independent acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics (IoA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (August 2016) or subsequent revisions. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment and/or stopping turbines under specific operational conditions.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 12 Cultural Heritage					
Pre-construction Phase					
MM96	Archaeological Monitoring Licence	EIAR Chapter 12	Application request to national Monuments Service in advance of ground works during the construction phase. Archaeological monitoring (under licence from the National Monuments Service) to monitor any pre-construction geotechnical engineering investigations prior to construction, if required.		
Construction Phase					
MM97	Sub Surface Archaeological Potential	EIAR Chapter 12	› Archaeological monitoring (under licence from the National Monuments Service) of any further geotechnical / engineering trial pits or investigations and a report detailing the results of same. › Archaeological monitoring of ground works during construction. This will include all excavation works within the EIAR site boundary as well as any topsoil removal along the haul route. If archaeological finds, features or deposits are uncovered during archaeological monitoring, the developer will be prepared to provide resources for the resolution of such features whether by preservation by record (excavation) or preservation in situ (avoidance).Once the project is completed, a report on the results of the monitoring will be compiled and submitted to the relevant authorities. The National Monuments Service will be informed of such findings and either preservation in situ (avoidance) or preservation by record (archaeological excavation) will be required.		
Chapter 14 Material Assets - Traffic					
Chapter 14 – Traffic					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Pre- Construction		
MM98	Traffic		Prior to the commencement of the construction phase of the Proposed Development a detailed Traffic Management Plan will be prepared by the Contractor for agreement with the relevant local authorities and An Garda Síochána . The TMP includes recommendations, which will include the measures below as a minimum requirement, for the following: › **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator will be appointed for the duration of the project and this person will be the main point of contact for all matters relating to traffic management. › **Delivery Programme** – a programme of deliveries will be submitted to the County Council in advance of deliveries of turbine components to site. Liaison with the relevant local authorities and Transport Infrastructure Ireland (TII) will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the site. › **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. › **A Pre and Post Construction Condition Survey** – Where required by the local authority, a pre-condition survey of roads associated		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			with the Proposed Development will be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. › **Liaison with the relevant local authority** - Liaison with the County Councils and An Garda Síochána I, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager. › **Implementation of temporary alterations to road network at critical locations** – at locations highlighted in section 14.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable. › **Identification of delivery routes** – These routes will be agreed with the County Councils and adhered to by all contractors. › **Delivery times of large turbine components** - The management plan includes the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. › **Travel plan for construction workers** – While the assessment above has assumed the worst case in that construction workers will drive		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			to the site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the site. › **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4.3. › **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
Construction Phase					
MM99	Traffic		The construction of this development will require significant coordination and the following comprehensive set of mitigation measures will be put in place before and during the construction stage of the project in order to minimise the effects of the additional traffic generated by the proposed wind farm. **Delivery of abnormal sized loads** The following are the main points to note for these deliveries. These will take place after peak evening traffic: › The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. › The deliveries will be made in consultation with the Local Authority and An Garda Síochána. › The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The turbine component deliveries will be made in consultation with the Local Authority and An Garda Síochána. › It is estimated that 234 abnormal sized loads will be delivered to the site, comprising 47 convoys of 5 abnormal vehicles and loads, undertaken over 47 separate nights. › These nights will be spread out over an approximate period of 24 weeks and will be agreed in advance with the relevant authorities. › In order to manage each of the travelling convoys, for each convoy there will be two police escort vehicles that will stop traffic at the front and rear of the convoy of 5 vehicles. › There will also be two escort vehicles provided by the haulage company for each convoy.		
Decommissioning Phase					
MM100	Decommissioning	EIAR Chapter 14	When the Proposed Development is decommissioned, a decommissioning plan will be prepared for agreement with the local authority, as described in Chapter 4. This plan will include a traffic management plan and other similar mitigation measures to those implemented during the construction phase. In terms of traffic effects the decommissioning stage will generally mirror the constructions stage although the effects will be significantly reduced as the volumes of materials removed from the site will be less.		
Chapter 14 Other Material Assets					
Pre- Construction					
Construction Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM101	Overhead Lines	EIAR Chapter 14	› Goal posts will be established under the overhead line for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running the site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g. component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site. › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.	MM91	Overhead Lines

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			All health and safety measures as detailed in the Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases.		
MM102	Waste Management	EIAR Chapter 14	› All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. › The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the wind farm site. Therefore, all waste streams generated on site will be deposited into a single waste skip. This waste material will be transferred to a 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 waste generated from the turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be deposited into the on-site skips and subsequently transferred to the MRF. › It is not envisaged that there will be any waste material arising from the materials used to construct the site roads as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis. › Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on site is forbidden.	MM92	Waste Management

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Operational Phase					
MM103	Tele-communications	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.		
MM104	Aviation	EIAR Chapter 14	› Turbines will be illuminated by high intensity obstacle lights that will allow the hazard to be identified and avoided by aircraft in flight (and in liaison with IAA requirement No.1 below) › Obstruction lights will be incandescent or of a type visible to Night Vision Equipment. › Obstruction lighting fitted to obstacles must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light › Provide as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location and Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.		
Decommissioning					
MM105	Decommissioning	EIAR Chapter 14	The measures outlined for the construction phase are considered the same for the decommissioning phase.		

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 Chapter 4	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	Drainage Inspection		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.	As Required	Monthly	Project Hydrologist
MX3	Surface Water Monitoring	CEMP Section 4	Baseline sampling will be completed on at least two occasions and these will 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.	Twice (Minimum)	As Required	Project Hydrologist
MX4	Invasive Species	EIAR Chapter 6	A pre-commencement invasive species survey shall be completed for the site.	Once	As required	Project Ecologist
MX5	Badger-Disturbance/Displacement	EIAR Chapter 6	A pre-construction badger survey will be undertaken at the location of the identified setts at Carranstown Bog by a qualified ecologist prior to the commencement of any works to determine	Once	Post Survey	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			if the setts are in use and to identify any additional sett entrances that may have been excavated in the intervening period. The outlier sett within the footprint of the proposed substation will be monitored for 2 weeks prior to construction using a camera trap to determine if it is in use. If the outlier sett in the construction footprint is found to be in use exclusion measures will be put in place prior to construction in line with NRA Guidelines[2] to ensure that the sett is evacuated. As per NRA guidelines exclusion from an active sett will only be carried out during the period of July to November inclusive in order to avoid the badger breeding season.			
MX6	Bats	EIAR Chapter 6	3-year post-construction monitoring for bats will include: • Static surveys • Transect surveys • Carcass searches	Seasonal	Seasonal	Project Ecologist
MX7	Birds	EIAR Chapter 7	Taking a precautionary approach, it is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Pre-commencement surveys will be undertaken prior to the initiation of works at the wind farm. Any requirement for construction works to run into the subsequent breeding season	Once	As required	Project Ornithologist

[2] *National Roads Authority (2006) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.*

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern. The survey will aim to identify sensitive sites e.g. nests or roosts depending on the season in question. Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas, where access allows. If winter roosts 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 the roost/nest is found to be active during the construction phase survey no works shall be undertaken within a species-specific buffer (as per Goodship, N.M. and Furness, R.W. 2022) in line with best practice. No works within the buffer zone shall be permitted until it can be demonstrated that that birds of conservation concern are no longer reliant on the roost/nest site.			
Construction Phase						
MX8	Archaeological Monitoring	EIAR Chapter 12	Archaeological monitoring (under licence from the National Monuments Service) of any further geotechnical / engineering trial pits or investigations and a report detailing the results of same. Archaeological monitoring of ground works during construction. This will include all excavation works within the EIAR site boundary as well as any topsoil removal along the haul route. If archaeological finds, features or deposits are uncovered during archaeological monitoring, the developer	As Required	As Required	Project Archaeologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			will be prepared to provide resources for the resolution of such features whether by preservation by record (excavation) or preservation in situ (avoidance).Once the project is completed, a report on the results of the monitoring will be compiled and submitted to the relevant authorities. The National Monuments Service will be informed of such findings and either preservation in situ (avoidance) or preservation by record (archaeological excavation) will be required.			
MX9	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 on-site. The ECoW or Project Hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible.	Daily	As Necessary	ECoW
MX10	Water Quality and Monitoring	EIAR Chapter 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
MX11	Surface Water Quality	CEMP Section 4	Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken as per water monitoring programme for the Proposed Development and each primary watercourse along the route. This will not be restricted to just these locations around the proposed renewable energy development site with further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager. In-situ field monitoring will be completed on a weekly basis. In-situ field monitoring will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-	As Required	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.			
MX12	Surface water Quality Monitoring	CEMP Section 4	During the construction phase, a field monitoring campaign will be undertaken in local streams where construction activity takes place which can affect water quality. This involves a) visual checks of drainage and streams, and b) daily measurements of field parameters temperature, pH, specific electrical conductivity (SEC), alkalinity and turbidity. Field measurements will be taken once a day, upstream and downstream of the construction activity. The field campaign will begin one week prior to activity and cease one week after activity is completed, unless observations dictate that measurements should continue. If visible impact occurs, works will be suspended at the discretion of the supervising engineer, in which case the problem will be identified and corrective action taken before recommencing works. Refer to Section 9.3.13 of the EIAR.	Daily	As Necessary	EcOW
MX13	Plant and Equipment Inspections	EIAR Chapter 5, Section 9 CEMP Section 4	The plant used should be regularly inspected for fuel leaks, unnecessary noise generation and general fitness for purpose.	As Required	Monthly	ECoW
MX14	Plant and Equipment Inspections	EIAR Chapter 5, Section 9 CEMP Section 4	Local areas of the haul route will be condition monitored and maintained, if necessary.	Daily	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX15	Flora and Fauna	CEMP Section 4	A Project Ecologist will be appointed. The responsibilities and duties of the Project Ecologist will include the following: › 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
MX16	Noise and Vibration	Section 11 CEMP	Monitoring typical levels of noise and vibration during critical periods and at sensitive locations will be carried out.	Daily	Monthly	ECoW
Operational Phase						
MX17	Surface Water Quality	CEMP Section 4	Monthly sampling for laboratory analysis for a range of parameters adopted during pre-commencement and construction phases will continue for six months during the operational phase. The Project Hydrologist will monitor and advise on the readings being received from the testing laboratory.	Monthly	Monthly	ECoW
MX18	Drainage Inspections	CEMP Section 3	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.	Monthly	Monthly	ECoW
MX19	Ornithology	EIAR Chapter 7	The programme of works will monitor parameters associated with a collision, displacement/barrier effects and habituation during the lifetime of the project. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, 10 & 15 of the life-time of the	Years 1, 2, 3, 5, 10, 15	Monthly	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			wind farm. Monitoring measures are broadly based on guidelines issued by the Scottish Natural Heritage (SNH, 2009). The following individual components are proposed: › Monthly flight activity surveys: vantage point surveys. › Breeding Bird surveys: Adapted Brown & Shepard › Annual kestrel nest box monitoring › Targeted bird collision surveys (corpse searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. The proposed programme of monitoring was not proposed in response to any identified significant effect but rather as a best practice measure (SNH, 2009). The monitoring is comprehensive and considered entirely adequate in this regard. The results of this monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.			
MX20	Bats	EIAR Chapter 6 Appendix 6-2	<u>Bat Monitoring Plan</u> includes for 3 years of post-construction monitoring is required to assess the effects of construction related habitat modification on bat activity i.e. the 50 metre separation between the proposed turbine blade tips and the nearest landscape feature,	Years 1, 2, 3	Annually	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			or the influence of aviation lighting. Post construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. The results of post construction monitoring shall be utilised to assess changes in bat activity patterns post construction and to monitor the implementation of the mitigation strategy. At the end of Year 1, and if a curtailment requirement is identified (i.e. significant bat fatalities encountered), a curtailment programme shall be devised around key activity periods and weather parameters in accordance with NIEA Guidance. The performance of any curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed would be analysed to confirm the efficacy of the curtailment during different periods of bat activity. At the end of each subsequent year of monitoring, the efficacy of the curtailment programme will be reviewed, and any identified efficiencies incorporated into the curtailment programme. This approach allows for an evidence-based review of the potential or bat fatalities at the site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally.			
MX21	Flora and Fauna	EIAR Chapter 6 Appendix 6-5	The Proposed Development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management (as described in the Biodiversity Management and Enhancement Plan) that will be implemented during the construction phase of the Proposed Development and maintained during the operational phase. Details of the management that will be undertaken are provided in the	See Appendix 6-5 for schedule	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Biodiversity Management and Enhancement Plan in Appendix 6-4 of the EIAR. These include: › Drain blocking within degraded peatlands › Surface Peat Assessments › Vegetation Sampling › Hydrological Monitoring			
Decommissioning Phase						
MX22	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
MX23	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. The invasive species survey will also be undertaken along the cable route to identify invasive species at joint bay locations where excavation to expose the cabling for removal will be required.	As required	As required	Project Ecologist
MX 24	Birds	EIAR Chapter 7	Taking a precautionary approach, it is proposed that works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Decommissioning monitoring surveys will be undertaken prior to works associated with decommissioning at the wind farm. The surveys will include a thorough walkover survey to a 500m radius of the development footprint and all works areas, where access allows. Any requirement for decommissioning works to run into the subsequent breeding season following commencement will be subject to a repeat of the decommissioning bird surveys to confirm the absence of breeding birds of conservation concern. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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 survey, no works shall be undertaken within a species-specific buffer (as per Goodship, N.M. and Furness, R.W. 2022), in line with industry best practise. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied			