17. SCHEDULE OF MITIGATION AND MONITORING PROPOSALS

17.1 Introduction

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

All mitigation which will be implemented during the various phases of the project are presented in Table 17-1 below. The mitigation measures have been grouped together according to their environmental field/topic and are presented under the following headings:

- Construction Management
- Drainage Design and Management
- Subsoils and bedrock
- Flora and Fauna
- Noise
- Air Quality/Dust
- Landscape and Visual
- Traffic
- Cultural Heritage

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during the future phases of the 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 4-9 and in the Decommissioning Plan (DP) which is included as Appendix 4-10 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 proposals are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring proposals in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the project to ensure all the required monitoring is completed as required.

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

17.2 Mitigation Measures

Table 17-1 Schedule of Mitigation

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
Pre-Commencement Phase				
MM1	EIAR Section 4	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. Information on the appointed permitted contractor and evidence of a maintenance contract will be submitted to the Planning Authority prior to any construction works taking place.		
MM2	EIAR Section 4	All site activities will be provided for in an Environmental Management Plan, prepared prior to the commencement of any operations onsite. The environmental management plan 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.		
MM3	EIAR Section 4 CEMP Section 4	An ECoW will oversee the site works and implementation of the Environmental Management Plan and provide on-site advice on the mitigation measures 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 all parties prior to commencement of construction, and may be further adjusted as required during the course of the project.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM4	CEMP Section 4	Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of construction at the site. The baseline monitoring programme will be subject to agreement with Roscommon County Council. Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken As a minimum the monitoring will be undertaken at the locations outlined in Figure 9-8 of the EIAR		
MM5	EIAR Section 4	The arrangements for concrete deliveries to the site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures.		
MM6	CEMP Section 3	The Project Hydrologist will assist in preparing a site drainage plan before construction commences.		
MM7	EIAR Section 4 CEMP Section 3	All materials and equipment necessary to implement the drainage mitigation measures will be brought on-site in advance of any works commencing. The drainage measures outlined in the EIAR will be installed prior to, or at the same time as the works they are intended to drain. An adequate amount of clean stone, silt fencing, stakes, etc. will be kept on site at all times to implement the drainage design measures as necessary.		
MM8	EIAR Section 4 CEMP Section 3	The works programme for the groundworks part of the construction phase of the project will also take account of weather forecasts and predicted rainfall in particular.		
MM9	CEMP Section 3	Prior to commencement of works in sub-catchments across the site main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM10	EIAR Section 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 Environmental Clerk of Works or the supervising hydrologist.		
MM11	EIAR Section 4	Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains		
MM12	EIAR Section 4	To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the upgradient side of the trench. Should any rainfall cause runoff from the excavated material, the material is contained in the downgradient cable trench		
MM13	EIAR Section 4 CEMP Section 3	The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site.		
MM14	EIAR Section 4 CEMP Section 3	In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM15	EIAR Section 4 CEMP Section 3	The site Construction Manager/Site Supervisor is responsible for making the decision to postpone or abandon works. Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast		
MM16	EIAR Section 6	Removal of trees, uncultivated vegetation and hedgerows will commence outside the bird nesting season (1st of March to 31st of August inclusive).		
MM17	EIAR Section 6	The footprint of the Proposed Development will be clearly marked out using post and rope prior to works commencing by a qualitied ecologist. There will be no access to the wider woodland area. All machinery will work from the existing access road corridor. Vegetation removal will be conducted in line with the provisions of the Wildlife Act.		
MM18	EIAR Section 6 CEMP Section 3	An Invasive Species Management Plan will be required if invasive species are found on site prior to construction.		
MM19	EIAR Section 4 CEMP Section 9	The procedures for the implementation of the mitigation measures outlined in such an EMP and their effectiveness and completion is typically audited by way of an Environmental Management Plan Audit Report. The EMP Audit Report effectively lists all mitigation measures prescribed in any of the planning documentation and any further mitigation measures proposed during the detailed design stage and allows them to be audited on a systematic and regular basis.		
MM20	EIAR Section 13	› Written and photographic records will be created of any monuments which will be impacted on, in advance of groundworks commencing on site;		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› All areas where the monuments will be impacted on will be removed by hand (under licence from the National Monuments Service), in advance of groundworks commencing on site; › Archaeological test trenching in the area of land take associated with the monument, in advance of groundworks commencing on site;		
MM21	EIAR Section 13	› Archaeological monitoring of all groundworks (under licence from the National Monuments Service) in the area of the monument. 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). › The National Monuments Service will be informed of such findings to discuss how best to proceed. Once the project is completed, a report on the results of the monitoring will be compiled and submitted to the relevant authorities; › A highly visible buffer zone will be established around all parts of the monument area located outside the proposed access roads.		
Construction Phase				
Construction Management				
MM22	EIAR Section 4 CEMP Section 3 NIS Section 6	On-site refuelling will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double axel custom-built refuelling trailer, will be re-filled off site and will be towed around the site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the proposed wind farm		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		development. The 4x4 towing vehicle will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction when not in use.		
MM23	EIAR Section 4 CEMP Section 3 NIS Section 6	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. Only ready-mixed concrete will be used during the construction phase, with all ready-mixed concrete being delivered from local batching plants in sealed concrete delivery trucks. Sand blinding, DPM and concrete blinding are to be provided at turbine formation level to create a vertical cut-off barrier and to mitigate the risk of concrete leakage into the ground below the turbine bases		
MM24	EIAR Section 4 CEMP Section 3 NIS Section 6	No washing out of any plant used in concrete transport or concreting operations will be carried out onsite. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be directed back to their batching plant for washout.		
MM25	EIAR Section 4	No concrete will be transported around the site in open trailers or dumpers so as to avoid spillage while in transport.		
MM26	EIAR Section 4	Clearly visible signs in prominent locations will be placed close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the site		
MM27	EIAR Section 4	All concrete used in the construction of turbine bases will be poured directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be poured from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM28	EIAR Section 4	Main pours will be planned days or weeks in advance. Large pours will be avoided when prolonged periods of heavy rain are forecast.		
MM29	EIAR Section 4	Concrete pumps and machine buckets will be restricted from slewing over watercourses while placing concrete.		
MM30	EIAR Section 4	Excavations will be sufficiently dewatered before concreting begins. Dewatering will continue while concrete sets.		
MM31	EIAR Section 4	Covers will be available for freshly placed concrete to avoid the surface washing away in heavy rain.		
MM32	EIAR Section 4	Disposing of surplus concrete after completion of a pour in suitable off-site locations away from any watercourse or sensitive habitats.		
MM33	EIAR Section 4 & 5 CEMP Section 3	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 compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression.		
MM34	EIAR Section 5 CEMP Section 3	All construction related traffic will have speed restrictions on un-surfaced roads to 20 kph.		
MM35	EIAR Section 4	A road sweeper will be available if any section of the public roads were to be dirtied by trucks associated with the Proposed Development.		
MM36	EIAR Section 5	During construction of the Proposed Development, all staff will be made aware of and adhere to the Health & Safety Authority's *'Safety, Health and Welfare at Work*		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		(Construction) Regulations 2013 (S.I. 291 of 2013), as amended'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan		
MM37	CEMP Section 2	Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. Liaison will be held with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. Excavation permits will be completed and all plant operators and general operatives will be inducted and informed as to the location of any services.		
Drainage Design and Management				
MM38	EIAR Section 9 CEMP Section 3 NIS Section 6	A 50-metre buffer zone will be maintained around watercourses during the windfarm construction. With the exception of road crossings of streams and associated culvert construction, no development infrastructure, vehicle or plant movement, construction activity or stockpiling of construction materials or construction waste will take place within this zone, and no vegetation will be removed from within this zone.		
MM39	EIAR Section 4 CEMP Section 3 NIS Section 6	Swales will be used to intercept and collect run off from construction areas of the site during the construction phase, and channel it to stilling ponds for sediment attenuation.		
MM40	EIAR Section 4 CEMP Section 3 NIS Section 6	Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site. It will then be directed to areas where it can be re-distributed over the ground as sheet flow.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM41	EIAR Section 4 CEMP Section 3 NIS Section 6	Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be left in place when the interceptor drains are backfilled at the end of the construction phase to limit linear flow in the backfilled drain. 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. The check dams will be installed as the interceptor drains are being excavated. The spacing and frequency of the check dams will be dependent on the gradient of the interceptor drain or swale in which they are being installed.		
MM42	EIAR Section 4	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 where possible in locations where they are not likely to contribute further to water ingress to construction areas of the site. The water carried in interceptor drains will not have come in contact with works areas of the site, and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be re-concentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope so as to prevent erosion.		
MM43	EIAR Section 4	Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions.		
MM44	EIAR Section 4 NIS Section 6	Stilling ponds will be used to attenuate runoff from works areas of the site of the Proposed Development during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Development during the		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.		
MM45	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. This will not be restricted to just these locations around the Proposed 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 Monthly basis. In-situ field monitoring will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring		
MM46	EIAR Section 4, 8 & 9 NIS Section 6	› Off-site refuelling will occur at a controlled fuelling station where possible. › On-site refuelling will be carried out using a mobile double skinned, bunded fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the Proposed Development. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction when not in use. Refuelling operations will be carried out only by designated trained and competent operatives. Mobile anti-pollution		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. › Fuels stored on site will be minimised. Storage areas where required will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; An emergency plan for the construction phase to deal with accidental spillages is contained within section 5 of this CEMP. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.		
MM47	EIAR Section 9	› No surface water will leave the Proposed Development site. All drainage measures will incorporate water infiltrating back to ground within the site boundary; › Where pumping water from turbine foundation excavations is necessary, the pumping rate will be limited to prevent overuse of the settlement ponds; › Excavations will be limited as much as possible in order to minimise the volume of spoil generated; › Sand blinding, DPM and concrete blinding will be provided at formation level to create a vertical cut-off barrier and to mitigate the risk of concrete leakage into the ground below; › Hardstands will be lined with Terram geotextile to limit direct discharge to the subsoil/bedrock		
MM48	EIAR Section 4	Silt fences will be installed as a series of triple silt fences. The silt fence designs follow the technical guidance document *'Control of Water Pollution from Linear Construction Projects'* published by CIRIA (CIRIA, No. C648, 1996). Each fence will consist of a		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		geotextile fabric such as Terrastop attached by staples to fixed stakes. The Terram sheets will be folded in an L shape with one metre extending horizontally in towards the works area. This horizontal section will be buried at a distance of approximately 150mm beneath the surface. Site 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.		
MM49	CEMP Section 4 EIAR Section 9	During the construction phase field testing 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 rainfall events		
MM50	EIAR Section 9	Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprised of best practice methods will be implemented. These include: › Subsoil reinstatement areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. › Construction of the site drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. › Near stream works will only be carried out during the period permitted by Inland Fisheries Ireland		
MM51	EIAR Section 4	Piped drains will be used to convey surface runoff from diversion swales and interceptor drains safely downslope of the infrastructure. From here, water is dispersed through the level spreaders or to settlement ponds. The piped drains will be semi-rigid corrugated pipes with a stabilised entrance and a rock apron at the outlet to trap sediment and dissipate the energy of the water. The base of drains leading into the top of the piped slope drain will be compacted and concavely		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		formed to channel the water into the corrugated pipe. The entrance at the top of the pipe will be stabilised with sandbags if necessary. Piped drains will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and blockage.		
MM52	EIAR Section 4 CEMP Section 3 NIS Section 6	The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site.		
MM53	EIAR Section 4 NIS Section 3	Material excavated to create the working area will be stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material will be covered with polythene sheets or sealed with the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur where appropriate.		
MM54	EIAR Section 4	A berm approximately 600 mm high will be constructed around the perimeter of each turbine base and a fence will be erected to prevent construction traffic from driving into the excavated hole and to demarcate the working area		
MM55	EIAR Section 4 NIS Section 3	The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;		
MM56	EIAR Section 4. CEMP Section 3	Where dewatering is required in cable trench excavation, silt laden water will be fully and appropriately attenuated before being appropriately discharged to vegetation or surface water drainage feature		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
	NIS Section 3			
MM57	EIAR Section 8	Mitigation Measures associated with Grid Connection works: › Although no in-stream works are proposed, the directional drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions; › The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance; › There will be no storage of material / equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse; › Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary; › Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions / channels that slope towards the watercourse; › Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered; › For HDD method, the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages; › Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; › Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site; › If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		ground (i.e. soil and subsoil exposures created during site preparation works); › This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse, or into a tanker for off site disposal; › The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing; › Any sediment laden water from the works area will not be discharged directly to a watercourse or drain; › Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted; › Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse; › If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; › On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion; › The silt fencing upslope of the watercourse/river will be left in place and maintained until the disturbed ground has re-vegetated; › There will be no batching or storage of cement allowed within 50m of any of the watercourse crossing;		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› There will be no refuelling allowed within 100m of the watercourse crossing; and, › All plant will be checked for purpose of use prior to mobilisation to the watercourse crossing locations.		
MM58	EIAR Section 8.	Horizontal Directional Drilling Fracture Blow-out (Frac-out) Prevention and Contingency Plan: › The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used); › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage; › One or more lines of silt fencing will be placed between the works area and the adjacent river; › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; › Adequately sized skips will be used where temporary storage of arisings are required; › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped; › Any frac-out material will be contained and removed off-site; › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM59	EIAR Section 9	Construction stage activities on the access road to T4 and at T4 will only be completed during the Summer Months (May – October) when the turlough is drained and empty		
Subsoils and Bedrock				
MM60	EIAR Section 8	It is proposed that a limited amount of spoil material will be stored around each turbine and hardstand		
MM61	EIAR Section 8	Spoil removed from turbine locations will be transported to the closest designated overburden storage areas.		
MM62	EIAR Section 8	› Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › Placement of turbines and associated infrastructure in areas with suitable ground conditions (based on detailed site investigation data); › All materials which require storage will be stockpiled at low angles (< 5-10°) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system; › Spoil disposal will take place within a minimal distance of each turbine to avoid excessive transport of materials within the site; › Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1m and 2m as indicated on the drawings; › Spoil will only be deposited on slopes of less than 5 degrees to the horizontal and greater than 10m from the top of a cutting; and, › No turbines or related infrastructure will be constructed near or on any designated sites such as NHAs or SACs		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM63	EIAR Section 8	Mitigation measures for the Kileglan karst landscape include using the paths of existing cleared tracks within the landscape for site access roads and emplacing the turbines on previously cleared lands where possible. During construction, all vehicle and construction plant operators will be advised of the location of the geological sites and instructed to avoid those areas where possible.		
MM64	EIAR Section 8	As the designated sites are distal to the Wind Farm Site, there can be no direct impacts on the land soils and geology of the designated sites. Indirect effects are considered and mitigated by: › Avoiding physical damage to watercourses, and associated release of sediment; › Avoiding excavations within close proximity to surface water courses; › Avoiding the entry of suspended sediment from earthworks into watercourses › Avoiding 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.		
MM65	EIAR Section 8 CEMP Section 3	The following issues incorporated into the construction phase of the project will assist in the management of the risks for this site (FT, 2020): › Appointment of experienced and competent contractors; › The site should be supervised by experienced and qualified personnel; › Allocate sufficient time for the project; › Prevent undercutting of slopes and unsupported excavations; › Maintain a managed robust drainage system;		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› Ensure construction method statements are followed or where agreed modified/ developed; and, › Revise and amend the Geotechnical Risk Register as construction progresses.		
Biodiversity				
MM66	EIAR Section	Where the Proposed Development footprint does occur on Annex I listed semi-natural dry grasslands [6210/6210*] habitat, the following measures will be implemented in advance of construction to minimise the area of habitat lost to the Proposed Development footprint: › Prior to any site clearance/enabling works, the required works area, including cut and fill, will be marked out using post and rope by the project engineer and project ecologist, › There will be no temporary storage of materials within areas of Annex I listed semi-natural dry grasslands [6210/6210*] habitat, › There will be no unnecessary tracking/shortcuts taken across areas of Annex I listed semi-natural dry grasslands [6210/6210*] habitat, › During initial vegetation stripping, all topsoil material will be temporarily stored on site and used for "dressing" the edges of the development infrastructure during reinstatement/regrading. This will be particularly important in areas of cut and fill. The stripped topsoil will contain a natural seed source of local provenance and result in the establishment of a species rich grassland.		
MM67		As part of mitigation to protect and preserve bat species, the following is proposed: › Planting of approximately 290m of species indigenous to the local area › During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001SI 359/1996).		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		In addition, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations: › Every light needs to be justifiable, › Limit the use of light to when it is needed, › Direct the light to where it is needed, › Reduce the light intensity to the minimum needed, › Use light spectra adapted to the environment, when using white light, use sources with a "warm" colour temperature (less than 3000K).		
MM68	EIAR Section 6	Best practice Forestry Service Guideline mitigation measures will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses as outlined in the EIAR.		
MM69	EIAR Section 7	Clearance of uncultivated vegetation, i.e. trees and hedgerows, will be undertaken outside the main breeding bird season, from March to August inclusive. If other site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement survey work would be undertaken to ensure that nest destruction and disturbance to sensitive species (i.e., breeding raptors and waders) are avoided. Where applicable, construction would not take place within specified disturbance-free buffer zones for certain sensitive species whilst those species are actively nesting.		
MM70	EIAR Section 7	If bird breeding activity of species of conservation concern are identified during the works, the nest sites will be located, and no works shall be undertaken within a buffer zone in line with industry best practise for each species: › Peregrine falcon – 500-750m › Northern lapwing – 300m		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› Eurasian curlew – 300m › Common snipe – 300m		
MM71	EIAR Section 6	The implementation of the Biodiversity Management and Enhancement Plan will ensure that any Annex I semi-natural dry grassland (6210/ 6210*) habitat that is lost to facilitate the proposed infrastructure will be replaced within the EIAR Site Boundary		
Noise				
MM72	EIAR Section 11	Measures to control noise levels associated with the works include: › limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; › establishing channels of communication between the contractor/developer, Local Authority and residents; › appointing a site representative responsible for matters relating to noise and vibration; › monitoring typical levels of noise and vibration during critical periods and at sensitive locations; › keeping site access roads even to mitigate the potential for vibration from lorries › selection of plant with low inherent potential for generation of noise and/ or vibration; › placing of noise generating / vibratory plant as far away from sensitive properties as possible within the site constraints, and; › regular maintenance and servicing of plant items		
MM73	EIAR Section 6 & 11	Plant will be selected taking account of the characteristics of noise emissions from each item. The timing of on- and off-site movements of plant near occupied properties will be controlled.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		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 (SI 359/1996).		
MM74	EIAR Section 5, 10 & 11 CEMP Section 3	The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the site. Proposed measures to control noise include: › 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 construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) 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;		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› 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 Section 11 of the EIAR 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 Friday and 8:00hrs and 13:00hrs on 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 › Training will be provided by the ECoW to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and, › Local areas of the haul route will be condition monitored and maintained if necessary. Where rock breaking is employed in relation to the Proposed Development, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities: › Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. › Ensure all leaks in air lines are sealed. › Use a dampened bit to eliminate ringing.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› Erect acoustic screen between compressor or generator and noise sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured. › Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation		
MM75	EIAR Section 11	All construction operations shall comply with guidelines set out in British Standard documents British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.		
Air Quality and Dust				
MM76	EIAR Section 4,5 & 10 CEMP Section 3	Measures to control dust levels associated with the works and activites that cold potentially impact on air quality include: › Truck wheels will be washed to remove mud and dirt before leaving the site where appropriate. › All plant and materials vehicles shall be stored in the dedicated compound area. › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › Construction traffic will be restricted to defined routes and a speed limit will be implemented. › Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions.		
MM77	EIAR Section 10	All construction machinery will be maintained in good operational order while on-site, minimising any emissions that are likely to arise.		
MM78	EIAR Section 10	In periods of extended dry weather, dust suppression may be necessary along haul roads and around the overburden storage areas to ensure dust does not cause a nuisance. If		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		necessary, water will be taken from settlement ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down haul roads and site compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.		
Landscape and Visual				
MM79	EIAR Section 10	The transportation of dry excavated material from the site to the designated on-site overburden storage areas, which may have potential to generate dust will be minimised. If necessary, excavated material will be dampened prior to transport to the overburden storage areas		
MM80	EIAR Section 12	As part of cabling works; › In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. › Where the cable trench is to be located in the road verge, subsoil should be piled on site and re-used after cabling works. Should any medium planting be removed, it should be replaced with the same or similar species whenever it is not possible to salvage and reinstate. New topsoil should be provided should the existing topsoil not be of sufficient standard (to comply with BS 3882:2015). › Any areas of bare soil remaining after the landscaping phase will be seeded as soon as possible with a grass seed mix to minimise sediment run-off		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
Traffic				
MM81	EIAR Section 5 & 14	The timing of peak delivery of construction materials to the proposed Wind Farm site (i.e. during turbine foundation pours and turbine component deliveries) will be carefully scheduled to minimise traffic disruption; particularly along the R363 and R362 which will be utilised for the delivery of materials and components and will accommodate the proposed Grid Connection infrastructure › Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made clear. › Access to properties will be maintained throughout any construction works and local residents will also be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum. › Deliveries of concrete and aggregate materials will occur early in the morning to reduce impact to road users. Furthermore, these deliveries will be sourced from local quarries which will reduce the distance of these deliveries, thereby reducing the impact to traffic and transport in the wider area		
Cultural Heritage				
MM82	EIAR Section 13	Buffer zones (Exclusion Zones) will be established around the recorded monuments where practicable within the Proposed Development EIAR boundary utilising the statutory Zones of Notification as the limits for the buffers. Each buffer should comprise durable temporary fencing capable of lasting throughout the construction phase of the development. Keep out signage should be placed on the perimeter of the buffer zone		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		Operational Phase		
MM83	EIAR Section 4	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. Information on the appointed permitted contractor and evidence of a maintenance contract having been submitted to the Planning Authority prior to any construction works taking place.		
MM84	EIAR Section 6	To reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented.		
MM85	EIAR Section 8 NIS Section 6 CEMP Section 3	The electrical substation 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		
MM86	EIAR Section 5	If required, wind turbine control measures will be implemented (SCADA System). Wind turbines will be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the Wind Farm. The shadow flicker control units will be added to any required turbines.		
MM87	EIAR Section 5	In the event of an occurrence of shadow flicker at residential receptor locations, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation;		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› 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.		
MM88	EIAR Section 5	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		
MM89	EIAR Section 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.		
MM90	EIAR Section 5	An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the site and providing for access for emergency services at all times.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM91	EIAR Section 9	The operational phase drainage system of the Proposed Development will be installed and constructed in conjunction with the road and hardstanding construction work as described below: › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean local drainage water, in order to minimise the amount of rainfall reaching areas where suspended sediment could become entrained. Collected drainage water will then be directed to areas where it can be slowly re-distributed over the ground surface and infiltrate through the soil and subsoils; › Swales/road side drains will be used to collect drainage from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › Check dams will be used along sections of access road drains to attenuate flows and intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; and, There will be no increase in runoff from the Wind Farm Site as a result of the Proposed Development.		
MM92	EIAR Section 4	Drainage swales and silting ponds will remain in place to collect runoff from roads and hardstanding areas of the Proposed Development during the operational phase.		
MM93	EIAR Section 11	Noise operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure predicted noise levels are within the relevant noise criterion curves/planning conditions. Such additional curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine operation		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
MM94	EIAR Section 14	As is standard practice for wind energy developments, the Applicant has entered into a protocol agreement with 2rn to ensure that any complaints received from the local public concerned are appropriately remediated. This is the standard protocol for such development proposals and is enclosed at Appendix 14-5. If, despite the 'mitigation-by-design' precautions undertaken to date, significant television signal interference in any form is identified and is attributed to the Proposed Development, appropriate remedial measures will immediately be undertaken. A range of technical measures are available to mitigate any instances of interference including signal amplifiers, active deflectors and relay transmitters, repeater stations, booster units, realignment of domestic aerials, installation of higher quality aerials and the installation of suppression equipment. Significant signal interference in relation to mobile phone signal, broadband and other telecommunications are not assessed as likely; however, should any interference occur which is directly attributable to the operation of the Proposed Development, remedial works will be promptly undertaken to ensure uninterrupted service provision.		
Decommissioning Phase				
MM95	EIAR Section 4	Prior to the end of the operational period the Decommissioning Plan (Appendix 4-4) will be updated in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time.		
MM96	DP Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the berms that will be temporarily removed during decommissioning at the turbine delivery accommodation roadway and the junction upgrade adjacent. The invasive species survey will also be undertaken along the cable route to identify invasive		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		species at joint bay locations where excavation to expose the cabling for removal will be required.		
MM97	EIAR Section 4 DP Section 3 NIS Section 6	The effectiveness of drainage measures in the natural drainage regime that will have resumed by the time of decommissioning will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site.		
MM98	EIAR Section 7	Good practice measures, similar to those employed during the construction phase, including surveys prior to decommissioning, to inform an up-to-date assessment of potential effects on important bird species, would be implemented during decommissioning		
MM99	EIAR Section 4 DP Section 2	On removal of turbines, the foundations will be covered using local topsoil/soil from the site or imported locally. The soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction		
MM100	EIAR Section 4 DP Section 3	The following mitigation measures are proposed to avoid release of hydrocarbons at the site: › Road-going vehicles will be refuelled off site wherever possible; › On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		› Only designated trained and competent operatives will be authorised to refuel plant on site. › Fuel volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately; › The plant used will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the decommissioning phase to deal with accidental spillages will be developed (refer to Section 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.		
MM101	EIAR Section 7	A Decommissioning Plan has been prepared (see Appendix 4-10) The following measures are proposed for the decommissioning phase: › During the decommissioning phase, disturbance limitation measures will be as per the construction phase (see Section 7 of the EIAR). › Plant machinery will be turned off when not in use. › All plant and equipment for use will comply with the Construction Plant and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001 (S.I. No. 632 of 2001). A project ecologist will be appointed to oversee the decommissioning phase, with similar duties to those outlined above during the construction phase.		
MM102	EIAR Section 14 DP Section 3	A Traffic Management Plan will be prepared in advance of any decommissioning works. The removal of turbines from site will be undertaken by a specialist haulier. The traffic management arrangements although similar to those that will be implemented for turbine delivery as outlined in the EIAR will be agreed in advance of decommissioning with the competent authority Roscommon County Council.		

Ref. No.	Reference Location	Mitigation Measure	Audit Result	Action Required
		The Traffic Management Plan for the decommissioning phase will also include provision for the removal of underground cables from the underground cabling along the R363. This will be done by opening the joint bays along the public road.		
MM103	EIAR Section 6	Blade Feathering On a precautionary basis, and in addition to buffers applied to habitat features, it is proposed that all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).		

17.3 Monitoring Measures

Table 17-2 Schedule of Monitoring

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Commencement Phase					
MX1	EIAR Section 9	An inspection and maintenance plan for the on-site drainage system will be prepared in advance of commencement of any works.	Ongoing	Monthly	ECoW
MX2	CEMP Section 3	Prior to commencement of works in sub-catchments across the site main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage.	As Required	Monthly	Project Hydrologist
MX3	EIAR Section 7	Pre-commencement bird surveys will be undertaken prior to the initiation of works at the Site	Once	As required	Project Ornithologist
Construction Phase					
MX4	EIAR Section 13	Archaeological monitoring of all ground works (to include roads, substation, turbine hardstands, bases and cable trenching) in the area of any monuments will be undertaken at the construction phase of the development.	Once	As required	Project Archaeologist
MX5	EIAR Section 13	A highly visible buffer zone will be established around all areas containing monuments onsite	Once	As required	Project Archaeologist
MX6	EIAR Section 4	Check dams will be inspected and maintained regularly to insure adequate performance. Maintenance checks will also ensure the centre elevation of the dam remains lower than the sides of the dam.	As Required	As Necessary	ECoW

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX7	EIAR Section 4	A water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond when it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.	As Required	As Necessary	ECoW
MX8	CEMP Section 4	Daily general visual inspections of site operations and inspections of all watercourses within the site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW	Weekly / As Required	As Necessary	ECoW
MX9	EIAR Section 4 CEMP Section 3	Inspections of the overburden storage areas will be made by a geotechnical engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil deposition areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.	Weekly / Monthly	As Necessary	Contractor/ Geotechnical Engineer
MX10	EIAR Section 4 CEMP Section 3	The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site.	As Required	As Necessary	ECoW / Project Hydrologist
MX11	EIAR Section 9	The plant used should be regularly inspected for leaks and fitness for purpose.	Before Use	As Necessary	Drivers / ECoW

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	CEMP Section 3				
MX12	EIAR Section 9	Surface water runoff from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground	Weekly/ Monthly	As Necessary	ECoW
MX13	EIAR Section 4	Regular inspections of all installed drainage systems will be undertaken, especially 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.	Weekly/ Monthly	As Necessary	ECoW
MX14	EIAR Section 9 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. This will not be restricted to just these locations around the Proposed 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 Monthly basis. In-situ field monitoring will also be completed after major rainfall events, i.e., after events of >25mm rainfall in any 24-hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.	Weekly, monthly and event based	As Necessary	ECoW / Project Hydrologist
MX15	CEMP Section 3	Training and supervision of drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.	As Required	As Necessary	ECoW
MX16	CEMP Section 3	The Project Ecologist will report to the ECoW and is responsible for the protection of sensitive habitats and species encountered during the	As required	As required	Project Ecologist

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		construction phase of the wind farm. The Project Ecologist will not be full time on site but will visit the site at least once a month during construction. The responsibilities and duties of the Project Ecologist will include the following: › Review and input to the final construction phase CEMP in respect of ecological matters; › In liaison with ECoW, oversee and provide advice on all relevant ecology mitigation measures set out in the planning documents for the Proposed Development; › Regular inspection and monitoring of the development, through all phases of construction/operation and provide ecological advice as required; › Carry out ecological monitoring and survey work as may be required by the planning authority; and, › Complete a pre-commencement invasive species survey at the site.			
MX17	EIAR Section 7	Prior to the start of construction and/or the breeding bird season, contractors would be made aware of the ornithological sensitivities within the Site (particularly with regard to the potential presence of sensitive breeding species) and Undertake surveys for nesting birds throughout the construction period that is within the nesting season and set up and monitor appropriate exclusion areas whilst nests of relevant species are in use.	Prior to the subsequent breeding season	As Necessary	Project Ornithologist
Operational Phase					

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX18	EIAR Section 7	Based on current best-practice guidelines (SNH, 2009), it is proposed that a targeted range of flight activity surveys and collision monitoring (carcass searching) should be undertaken during the non-breeding season in years 1, 2 and 3 post construction, in order to monitor the rate of avian turbine collisions and verify the predictions made in this assessment.This should include bird strikes/fatalities including the impact on any such results of the removal of carcasses by scavengers	Monthly or as required	Years 1, 2 and 3 the life of a wind farm	Project Ornithologist
MX19	EIAR Section 6	Ongoing monitoring of bat activity will be undertaken for at least 3 years' post construction of the Wind Farm. This will provide data and information on the actual recorded impact of the wind turbines on the local bat populations and should include bat strikes/fatalities including the impact on any such results by the removal of carcasses by scavengers	Monthly or as required	Years 1, 2 and 3 of the life of a wind farm	Project Ornithologist
MX20	EIAR Section 9	Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. This will be part of the regular maintenance of the on-site drainage system.	As Required	Weekly	ECoW
MX21	EIAR Section 11	Operational phase noise monitoring surveys will be carried out to ensure compliance with any noise conditions applied to the Proposed Development	Once	On completion of Programme	Project Noise Consultant
MX22	EIAR Section 6	The implementation of the Biodiversity Management and Enhancement Plan will ensure that any Annex I semi-natural dry grassland (6210/ 6210*) habitat that is lost to facilitate the proposed infrastructure will be replaced within the EIAR Site Boundary. The Biodiversity Management and Enhancement Plan includes for the management and reversion of 10 hectares of improved – semi-improved agricultural grassland back to a species-rich dry grassland	Once	As Necessary	Project Ecologist

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		community. In addition, there landowner agreement has been secured that there will be no further land reclamation within areas of Annex I semi-natural dry grassland (6210/ 6210*) habitat for the lifetime of the Proposed Development, see Appendix 6-5. The farm plans will commence during the construction phase of the Proposed Development and will be maintained for the operational lifetime of the Proposed Development			
MX23	EIAR Section 5	In order to ensure that the model and SCADA system is accurate and working well a site visit will be carried out to verify the system and a report on the compliance of the Wind Farm with its limits will be compiled.	Once	Within 1 year	EcoW
Decommissioning Phases					
MX24	DP Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the berms that will be temporarily removed during decommissioning at the turbine delivery accommodation roadway and the junction upgrade adjacent and 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
MX25	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
MX26	DP Section 3	In general, the ECoW will maintain responsibility for monitoring the decommissioning works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters. The Site Manager will be responsible for reporting to and liaising with Roscommon County Council and other statutory bodies as required	As required	As required	ECoW/ Site Manager

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX27	EIAR Section 9	Regular inspections of all installed drainage systems will be undertaken, especially 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	As Required	Weekly	ECoW
MX28	CEMP Section 3	Training and supervision of drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation during the decommissioning phase.	As Required	As Necessary	ECoW
MX29	CEMP Section 4	Daily general visual inspections of site operations and inspections of all watercourses within the site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW	Weekly / As Required	As Necessary	ECoW
MX30	EIAR Section 7	Prior to the start of decommissioning and/or the breeding bird season, contractors would be made aware of the ornithological sensitivities within the Site (particularly with regard to the potential presence of sensitive breeding species) and undertake surveys for nesting birds throughout the decommissioning period that is within the nesting season and set up and monitor appropriate exclusion areas whilst nests of relevant species are in use.	Prior to the subsequent breeding season	As Necessary	Project Ornithologist