

18.

SCHEDULE OF MITIGATION AND MONITORING PROPOSALS

18.1

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 18-1 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
- > Felling
- > Peat Management
- > Biodiversity
- > Ornithology
- > Hydrology
- > Air Quality/Dust
- > Climate
- > Noise and Vibration
- > Cultural Heritage
- > Traffic

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 4-3 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 18-2. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring proposals are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring proposals in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the 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.

EIAR Mitigation Measures

Table 18-1 Schedule of Mitigation

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Development					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Section 4	All proposed activities on the site of the Proposed Development will be provided for in an environmental management plan. This EIAR Chapter should be read in conjunction with the CEMP, which includes more detailed information on the environmental management framework to be adhered to during the pre-commencement and construction phases.		
MM2	Environmental Management	EIAR Section 4	The on-site construction staff will be responsible for implementing the mitigation measures specified in the EIAR and compiled in the Audit Report. Their implementation will be overseen by the ECoW or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.		
MM3	Drainage Inspection	CEMP Section 3	<p>Prior to commencement of works in sub-catchments across the site, main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment by catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.</p> <p>Drainage and associated pollution control measures will be implemented onsite in conjunction with the main construction works. 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.</p>		
MM4	Site Drainage Plan	EIAR Section 4 CEMP Section 4	A detailed drainage design for the Proposed Development, incorporating all principles and measures outlined in Section 4.7 of the EIAR, has been prepared, and is included in Appendix A of Appendix 4-4 of this EIAR.		
MM5	Preparative Site Drainage Management,	CEMP Section 3	<p>All materials and equipment necessary to implement the drainage measures outlined above will be brought on-site in advance of any works commencing.</p> <p>An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures outlined in the above will be installed prior to, or at the same time as the works they are intended to drain.</p>		
MM6	Preparative Site Drainage Management,	CEMP Section 3	Prior to commencement of works in sub-catchments across the site, main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment by catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.		
MM7	Waste Management	CEMP Section 3	Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.		
MM8	Felling	EIAR Section 4	Construction will not commence (excluding any activity associated with the biodiversity and enhancement plan), until the forestry which hosted the 2023 hen harrier nest is no longer suitable for hen harrier. This forestry was planted in 2018. It is considered that pre-thicket forestry is suitable for breeding hen harrier within the first ten		

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			years of planting. It is therefore considered that during the normal course of events, this forestry block will become unsuitable for hen harrier in c. 2028. Before construction works can begin, habitat surveys must be undertaken to demonstrate that the forestry is no longer suitable for breeding hen harrier. The forestry must be confirmed to be unsuitable closed canopy forestry. These surveys will be conducted after the breeding season has ended (September/October) by a suitably qualified ornithologist, at the location of the 2023 hen harrier nest site, from 2026 onward, until it can be demonstrated that the forestry is no longer suitable for breeding hen harrier.		
MM9	Felling Licence	EIAR Section 4 CEMP Section 4	The tree felling activities required as part of the Proposed Development will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the “Forestry Act” and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service’s policy on granting felling licenses for wind farm developments.		
MM10	Peat Management	EIAR Section 4	Prior to commencing the construction of the excavated roads movement monitoring posts will be installed in areas where the peat depth is greater than 2.0m. Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.		
MM11	Invasive Species Management	CEMP Section 3	To establish good site hygiene to ensure the control of any potential spread of invasive species during construction works, a risk assessment and method statement must be provided by the Contractor prior to commencing works.		
MM12	Invasive Species Management	CEMP Section 3	<p>Mitigation has been provided in relation to the control of a small stand of Rhododendron identified within the footprint of a proposed existing road to be upgraded, located to the northwest of T4. The infestation is approx. 4m in width and is located adjacent to the road on the western side. Due to the construction works associated with the upgrade of this road, in the absence of mitigation there is potential for spread of this species to other habitats within the Proposed Development Site and outside of the Proposed Development Site. This could occur via dispersal of seeds locally, or inappropriate disposal of the plant material whereby seeds or propagatable material are spread to another area. Vector material may also be spread to other sites as a result of entrainment within machinery or staff clothing.</p> <p>The following measures will be in place to avoid impacts to biosecurity as a result of construction of the Proposed Development:</p> <p>Rhododendron regrows vigorously when cut. As a result, some method of stump killing or removal is always necessary. Any untreated cut stump will regrow and in most cases flower within 3-4 years. The following measures will be in place:</p> <ul style="list-style-type: none"> ➤ A pre-commencement survey for invasive species within the footprint of the Proposed Wind Farm Site will be carried out by a suitably qualified ecologist to ensure there is no new growth of Third Schedule invasive species in these areas. ➤ If additional invasive species are recorded within the construction areas, an Invasive Species Management Plan will be prepared in advance of construction which will incorporate the measures necessary to prevent spread additional to the measures laid out below. ➤ A Toolbox Talk will be given by the Environmental Clerk of Works or Ecological Clerk of Works in relation to the management of invasive species within construction areas. ➤ The infested area will be demarcated and works in the vicinity of the infestation will only be carried out under supervision by a suitably qualified Ecological Clerk of Works or Environmental Clerk of Works. ➤ In advance of construction of the road upgrade works in the vicinity of the infested area, it will be necessary to completely remove the infestation outside of the flowering period (May to July) and dig the roots completely out. The effectiveness of this technique is increased by removing all viable roots. To avoid regrowth, stumps will be turned upside down and soil will be brushed off roots. The roots are relatively shallow, seldom being deeper than 45cm.¹ ➤ Once the supervising ecologist confirms that the material is dried out and non-viable, it will be chipped and composted on-site. ➤ It is envisaged that no contaminated soil is to be removed from the Proposed Development Site but is to be reinstated within the site, thus negating the need for transport off-site, further risk of spread, and licencing requirements. Should potentially contaminated spoil be required to be removed from the site, it will be transported to a suitably licenced waste facility and will require a licence from the NPWS prior to its transportation. <p>In order to avoid the potential for spread of invasive species into the Proposed Development Site:</p>		

¹ TII (2020) - The Management of Invasive Alien Plant Species on National Roads – Technical Guidance GE-ENV-01105

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			<ul style="list-style-type: none"> ➤ Any construction material imported into the Proposed Development Site will come from a source confirmed to be free of invasive species. ➤ All plant and machinery will be thoroughly cleaned before entering and exiting the Proposed Development Site. 		
MM13	Traffic Management	EIAR Section 4	A full dry run of the transport operation along the proposed route will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the Traffic Management Plan submitted for agreement with Limerick and Clare County Councils. All turbine deliveries will be provided for in the Transport Management Plan which will be finalised in advance of the construction stage, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. The finalised Transport Management Plan will be submitted to the Planning Authority for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.		
MM14	Health and Safety	EIAR Section 4	All relevant Site Health & Safety procedures, in accordance with the relevant Health and Safety Legislation and guidance (listed in Section 5.5 of Chapter 5: Population and Human Health of the EIAR), including the preparation of the Health & Safety Plan, erection of the relevant and appropriate signage on site, inductions and toolbox talks will take place prior to and throughout the construction phase of the Proposed Development.		
Construction Phase					
MM15	Refuelling	EIAR Section 4 CEMP Section 3	<ul style="list-style-type: none"> ➤ All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Proposed Development site. ➤ On site re-fuelling of machinery will be carried, as required, 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. ➤ The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. ➤ The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. ➤ Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; ➤ Onsite refuelling will be carried out by trained personnel only; ➤ A permit to fuel system will be put in place; ➤ Fuels stored on site will be minimised. Fuel storage areas if 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; <ul style="list-style-type: none"> ➤ The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, ➤ An emergency plan for the construction phase to deal with accidental spillages is included in Section 5 of this CEMP. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area. 		
MM16	Concrete Deliveries and Management	EIAR Section 4 CEMP Section 3	<p>The following mitigation measures will be implemented in full to avoid release of cement leachate from the site:</p> <ul style="list-style-type: none"> ➤ No batching of wet-cement products will occur on the Wind Farm Site or along the Grid Connection route. Ready-mixed supply of wet concrete products and/or emplacement of pre-cast elements will take place; ➤ 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 to the Proposed Development site, only the 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 is to be isolated in temporary lined wash-out pits located near proposed wind farm site compound. These temporary lined wash-out pits will be removed from the wind farm site at the end of the construction phase; ➤ The contractor will use weather forecasting to plan dry days for pouring concrete; and, ➤ The contractor will ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event. <p>Because of the scale of the main concrete pours that will be required to construct the Wind Farm, the main pours will be planned days or weeks in advance. Special procedures will be adopted in advance of and during all concrete pours to minimise the risk of pollution. These will include:</p> <ul style="list-style-type: none"> ➤ Using weather forecasting to assist in planning large concrete pours, and avoiding large pours where prolonged periods of heavy rain is forecast. ➤ Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete. ➤ Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. ➤ Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain. 		

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			<ul style="list-style-type: none"> > The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent (see Section 4.2.14.3.8 above). > Disposing of surplus concrete after completion of a pour in suitable off-site locations away from any watercourse or sensitive habitats. 		
MM17	Road Cleanliness	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.		
MM18	Watercourse Buffers	EIAR Section 4	All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. The distance will vary between 5-20m depending on local slope, the nature of local soil deposits and also the type of vegetation present. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Development.		
MM19	Water Discharge	EIAR Section 4 CEMP Section 2	There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. The distance will vary between 5-20m depending on local slope, the nature of local soil deposits and also the type of vegetation present. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Development.		
MM20	Drainage Swales	EIAR Section 4 CEMP Section 2	<p>Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the site and prevent it reaching natural watercourses.</p> <p>Drainage swales will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike.</p>		
MM21	Interceptor Drains	EIAR Section 4 CEMP Section 2	<p>Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area.</p> <p>The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike.</p>		
MM22	Check Dams	EIAR Section 4 CEMP Section 3	Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. Check dams are designed to reduce velocity and control erosion and are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams will be removed. For this reason, 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.		
MM23	Level Spreaders	EIAR Section 4 CEMP Section 3	A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site.		
MM24	Piped Slope Drains	EIAR Section 4 CEMP Section 3	Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM25	Vegetation Filters	EIAR Section 4 CEMP Section 3	<p>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.</p> <p>Vegetation filters will carry outflow from the level spreaders as overland sheet flow, removing any suspended solids and discharging to the groundwater system by diffuse infiltration.</p> <p>Vegetation filters will not be used in isolation for waters that are likely to have higher silt loadings. In such cases, silt-bearing water will already have passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader.</p>		
MM26	Stilling Ponds	EIAR Section 4 CEMP Section 3	<p>Stilling or settlement 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 operational phase.</p>		
MM27	Dewatering Silt Bag	EIAR Section 4 CEMP Section 3	<p>Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of peaty silt into the stream.</p>		
MM28	Siltbuster	EIAR Section 4 CEMP Section 3	<p>A “siltbuster” or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit.</p>		
MM29	Sedimats	EIAR Section 4 CEMP Section 3	<p>Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure</p>		
MM30	Culverts	EIAR Section 4 CEMP Section 3	<p>Some culverts may be installed to transport drainage waters from works areas of the Proposed Development, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge and treatment. The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culvert. Furthermore, all new proposed culverts and proposed culvert upgrades will be suitably sized for the 100-yr flood flow from the upstream catchment with an included factor (+20%) for climate change.</p> <p>Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling doesn’t occur above or below the culvert and water can continue to flow as necessary.</p> <p>All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.</p>		
MM31	Silt Fences	EIAR Section 4	<p>➤ Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Development.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3			
MM32	Forestry Felling	CEMP Section 3	<p>There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document</p> <p>With moderate slopes existing across much of the Wind Farm Site, a 10m setback for felling will be established along all aquatic zones. Buffer zone widths will be increased at vulnerable hydrological features where deemed necessary. This will ensure water quality is protected during the felling operations. However, most of the Proposed Development infrastructure is located outside of the 50m hydrological buffer zone, thereby limiting the felling which will occur in close proximity to natural watercourses.</p> <p>The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:</p> <ul style="list-style-type: none"> ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the 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. <p>Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:</p> <ul style="list-style-type: none"> ➤ Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; ➤ All machinery will be operated by suitably qualified personnel; ➤ Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicles through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; ➤ Machines will traverse the site along specified off-road routes (referred to as racks); ➤ The location of racks will be chosen to avoid wet and potentially sensitive areas; ➤ Brash mats will be placed on the racks to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall. An ECoW will monitor forecasts and determine when works should be suspended; ➤ Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; ➤ In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during construction; ➤ Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; ➤ Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; ➤ Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff (refer to Pre-Emptive Site Drainage Management below); ➤ Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. 		

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MM33	Borrow Bit Drainage	CEMP Section 3	<p>An interceptor drain will be installed upslope of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated.</p> <p>Temporary control of groundwater within the borrow pits will be required and exact measures will be determined as part of the confirmatory ground investigation programme. A temporary pump and suitable outfall locations will be required during construction. Perimeter drains will be installed around the individual cells within the borrow pits and will discharge to a settlement pond at the lower side/outfall location of the borrow pits.</p> <p>During the construction phase of the project, it will be necessary to keep the borrow pit area free of standing water while rock is still being extracted. This will be achieved by using a mobile pump, which will pump water into the same series of drains, settlement ponds and level spreader, which will receive the water from the outfall.</p>		
MM34	Peat Management	EIAR Section 4 CEMP Section 2, 3	<p>The following measures which will be implemented in full during the construction phase of the project will assist in the management of the risks for this site.</p> <ul style="list-style-type: none"> ➤ Appointment of experienced and competent contractors; ➤ The site will be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); ➤ Undercutting of slopes and unsupported excavations will not occur; ➤ A managed robust drainage system as set out above; ➤ Prevent placement of loads/overburden on marginal ground; ➤ Set up, maintain and report findings from monitoring systems (as outlined in the Geotechnical and Peat Stability Assessment); ➤ Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and, ➤ Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction. ➤ Maintain hydrology of area as far as possible by maintaining existing drains to water pressures in the peat to avoid peat becoming “boyant”. ➤ Use of experienced geotechnical staff for site investigations ➤ Use of experienced contractors and trained operators to carry out the work. ➤ Confirmatory ground investigation to determine peat, mineral soil and bedrock condition and properties. ➤ Uncontrolled concentrated water discharge onto peat slopes identified as being unsuitable for such discharge will be avoided. All water discharged from excavations during work will be piped over areas specifically assessed as being unsuitable and hence directly into suitable drainage lines. ➤ All excavations will be suitably supported to prevent collapse and development of tension cracks. ➤ Avoidance of placing fill and excavations in the vicinity of steeper peat slopes, that is at the crest or toe of the slope. ➤ Installation and regular monitoring of geotechnical instrumentation during construction in areas of possible poor ground, such as deeper peat deposits. ➤ Site reporting procedures will be implemented to ensure that working practices are suitable for the encountered ground conditions. Ground conditions will be assessed by a suitably experienced geotechnical engineer. ➤ Regular briefing of all site staff (e.g., toolbox talks) to provide feedback on construction and ground performance and to promote reporting of any observed change in ground conditions. ➤ Routine inspection of Proposed Development site by the Contractor and Project Geotechnical Engineer will be undertaken and will include an assessment of ground stability conditions (e.g., cracking, excessive floating road settlement, disrupted surface, closed-up drains) and drainage conditions (e.g., blocked drains, absence of water in previously flowing drains, springs, etc.). 		
MM35	Dust Control	CEMP Section 3 EIAR Section 4	<p>Proposed measures that will be implemented in full to control dust include:</p> <ul style="list-style-type: none"> ➤ 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 will be carried out along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, increased runoff. ➤ All plant and materials vehicles for the Proposed Development will be stored in dedicated areas within the Wind Farm Site. ➤ Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. ➤ Turbines and construction traffic will be transported to the Wind Farm Site on specified haul routes only. ➤ Grid Connection infrastructure will be transported to the Grid Connection on specified haul routes only. ➤ Construction materials for the proposed Grid Connection and a small volume for the proposed Wind Farm Site will be sourced locally from licenced quarries. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> > The agreed haul route road adjacent to the Wind Farm Site will be checked weekly by the Site Manager for cleanliness and cleaned as necessary. > The roads adjacent to the Wind Farm Site entrances will be checked weekly for damage/potholes and repaired as necessary. > The transportation of materials from the borrow pits around the Wind Farm Site will be covered by tarpaulin or similar covered vehicles. > The transportation of construction materials from locally sourced quarries for the proposed Grid Connection infrastructure and a small volume for the proposed Wind Farm Site will be covered by tarpaulin . > In periods of extended dry weather, excavated material will be dampened prior to transport to the spoil management areas. > Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by an appropriately licensed waste contractor. The MRF facility will be local to the Proposed Development to reduce the amount of emissions associated with vehicle movements. 		
MM36	Noise Control	CEMP Section 3 EIAR Section 4	<p>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 that will be implemented in full to control noise include:</p> <ul style="list-style-type: none"> > 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 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 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. <p>Where rock breaking is employed, the following are examples of measures that will be employed, to mitigate noise emissions from these activities:</p> <ul style="list-style-type: none"> > 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. > 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 <p>In respect of the Grid Connection construction, a solid hoarding will be employed at rock breaking plant where there are Noise Sensitive Locations (NSLs) are within 25m of the activity. Such a measure will be expected to reduce rock breaking noise at the NSL by 10 decibels.</p>		
MM37	Vibration Control	CEMP Section 3	<p>Specific to blasting the following mitigation measures will be employed to control the impact during blasts:</p> <ul style="list-style-type: none"> > Trial blasts may be undertaken to obtain scaled distance analysis; > Ensuring appropriate burden to avoid over or under confinement of the charge; > Accurate setting out and drilling; > Appropriate charging; > Appropriate stemming with appropriate material such as sized gravel or stone chipping; > Delay detonation to ensure small maximum instantaneous charges; > Decked charges and in-hole delays; > Blast monitoring to enable adjustment of subsequent charges; > Good blast design to maximise efficiency and reduce vibration; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Avoid using exposed detonating cord on the surface. 		
MM38	Invasive Species	CEMP Section 3 EIAR Section 6	<ul style="list-style-type: none"> ➤ A Toolbox Talk will be given by the Environmental Clerk of Works or Ecological Clerk of Works in relation to the management of invasive species within construction areas. ➤ The infested area will be demarcated and works in the vicinity of the infestation will only be carried out under supervision by a suitably qualified Ecological Clerk of Works or Environmental Clerk of Works. ➤ In advance of construction of the road upgrade works in the vicinity of the infested area, it will be necessary to completely remove the infestation outside of the flowering period (May to July) and dig the roots completely out. The effectiveness of this technique is increased by removing all viable roots. To avoid regrowth, stumps will be turned upside down and soil will be brushed off roots. The roots are relatively shallow, seldom being deeper than 45cm.² ➤ Once the supervising ecologist confirms that the material is dried out and non-viable, it will be chipped and composted on-site. ➤ It is envisaged that no contaminated soil is to be removed from the Proposed Development Site but is to be reinstated within the site, thus negating the need for transport off-site, further risk of spread, and licencing requirements. Should potentially contaminated spoil be required to be removed from the site, it will be transported to a suitably licenced waste facility and will require a licence from the NPWS prior to its transportation. <p>In order to avoid the potential for spread of invasive species into the Proposed Development Site:</p> <ul style="list-style-type: none"> ➤ Any construction material imported into the Proposed Development Site will come from a source confirmed to be free of invasive species. ➤ All plant and machinery will be thoroughly cleaned before entering and exiting the Proposed Development Site. 		
Chapter 5: Human Beings					
Pre-Commencement Phase					
MM39	Human Health	EIAR Section 5	Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be identified in line with the Engagement plan. Local access to properties will also be maintained throughout any construction works and local residents will also be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
Construction Phase					
MM40	Human Health	EIAR Section 5	<p>The Proposed Development will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation, including:</p> <ul style="list-style-type: none"> ➤ Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); ➤ Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007), as amended; ➤ Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. 291 of 2013), as amended; and ➤ Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006). <p>A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail and is summarised below.</p> <p>All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. All construction, delivery and security staff will hold Safepass registration cards.. Construction operatives will hold a valid Construction Skills Certificate Scheme card. The developer will be required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting site access during construction. Fencing will be erected in areas of the site where uncontrolled access is not permitted. Safety Notice signs will be posted, directing all visitors to the site manager. Appropriate warning measures including ‘goalposts’ will be used as appropriate to prevent contact with any overhead lines that traverse the Wind Farm Site and Grid Connection. One 38kV overhead line crosses the Wind Farm Site in a southeast to northwest direction, from Limerick City to Tulla. One 400kV overhead line intersects the northwestern boundary of the Wind Farm Site, travelling from Moneypoint in the direction of Dublin.</p> <p>Owing to the scale and scope of the Proposed Development a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) will be appointed in accordance with the provisions of the Health & Safety Authority’s ‘<i>Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006</i>’.</p>		

² TII (2020) - The Management of Invasive Alien Plant Species on National Roads – Technical Guidance GE-ENV-01105

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>The PSDP appointed for the construction stage will be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):</p> <ul style="list-style-type: none"> ➤ Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; ➤ Where possible, eliminate the hazards or reduce the risks; ➤ Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; ➤ Ensure that the work of designers is coordinated to ensure safety; ➤ Organise co-operation between designers; ➤ Prepare a written Safety and Health Plan; ➤ Prepare a safety file for the completed structure and give it to the client; and ➤ Notify the Authority and the client of non-compliance with any written directions issued. <p>The PSCS appointed for the construction stage will be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):</p> <ul style="list-style-type: none"> ➤ Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; ➤ Compile and develop safety file information ➤ Reporting of accidents / incidents; ➤ Weekly site meeting with PSCS; ➤ Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ➤ Induction of all site staff including any new staff enlisted for the project from time to time; ➤ Toolbox talks as necessary; ➤ Maintenance of a file which lists personnel on site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ➤ Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ➤ Monitor the compliance of contractors and others and take corrective action where necessary; and ➤ Notify the Authority and the client of non-compliance with any written directions issued. 		
MM41	Human Health	EIAR Section 5	Signage indicating the designated pedestrian route along the hiking trails will be in place during the construction phase of the development. Likewise, appropriate construction site warning signage and health and safety signage will be in place along the hiking trails and on the approach to the construction site at all times during the construction phase to ensure that any potential impacts pertaining to existing amenity access is mitigated against. Furthermore, all health and safety procedures as detailed in Section 5.9.2.3 will be strictly adhered to ensure not only the safety of construction staff but any users of the hiking trails during the construction phase.		
MM42	Human Health	EIAR Section 5	<p>A Traffic Management Plan (TMP), incorporating all the mitigation measures set out in the CEMP, is included in Chapter 15 of the EIAR. The TMP will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads' authority and An Garda Síochána prior to construction works commencing on the Proposed Development. The detailed TMP includes the following:</p> <ul style="list-style-type: none"> ➤ 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 relevant County Councils (Clare and Limerick) in advance of deliveries of turbine components to site. Liaison with the 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. ➤ Temporary traffic management measures during construction of Wind Farm Site at access junctions during construction – Temporary measures including signage at access Junctions B at Sallybank, C and D at Snaty. ➤ Temporary traffic management measures during construction of Grid Connection – Including signage and implementation of temporary traffic diversions. ➤ Temporary traffic signs and traffic management measures for the construction phase of the proposed temporary transition compound on the N69 – As part of the traffic management measures temporary traffic signs will be put in place at the access points for the transition zone located on the N69. All measures will be in accordance with the “Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works” (DoT now DoTT&S) and “Guidance for the Control and Management of Traffic at Roadworks” (DoTT&S). Construction staff (flagman) will be present at key junctions during peak delivery times. This will include a request to TII / LC&CC for a temporary speed reduction for the 85 day construction period. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>➤ 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.</p> <p>➤ A Pre and Post Construction Condition Survey – Where required by the Local Authorities, a pre-condition survey of roads associated 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. 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.</p> <p>➤ Liaison with the relevant local authority - Liaison with the County Councils and An Garda Síochána will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and “prior to commencement” status of the relevant roads established, (in compliance with the provisions of the CEMP), the relevant Roads Sections will be informed of the names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager.</p> <p>➤ Implementation of temporary alterations to road network at critical locations – at locations highlighted in section 15.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable.</p> <p>➤ Identification of delivery routes – These routes will be agreed with the County Councils and adhered to by all contractors.</p> <p>➤ Delivery times of large turbine components - The management plan will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.</p> <p>➤ Travel plan for construction workers – While the assessment above has assumed the worst case in that construction workers will drive to the site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the site.</p> <p>➤ 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.</p> <p>➤ Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.</p> <p>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. Local access to properties will also 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.</p> <p>Deliveries of concrete and aggregate materials that cannot be source from the onsite borrow pits will. will be sourced from local quarries which will reduce the distance of these deliveries, thereby reducing the effect to traffic and transport in the wider area.</p>		
MM43	Human Health	EIAR Section 5	<p>The majority of aggregate material for the construction of roads and turbine bases will be sourced from the proposed borrow pit located within the main site of the proposed wind farm development, therefore limiting the distance needed to transport this material to the site. Truck wheels will be washed to remove mud and dirt before leaving the site. All plant and materials vehicles will be stored in the compound area or other dedicated areas. 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.</p> <p>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 the site’s drainage system, and will be pumped into a bowser or water spreader to dampen down haul roads and the temporary site compound to prevent the generation of dust. Silty or oily water will not be used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.</p> <p>The active construction area along the intended grid connection route options will be small, ranging from 150-300m in length at any one time. Should separate crews be used during the construction phase they will generally be separated by 1-2km. All construction machinery will be maintained in good operational order while on-site, minimising any emissions that are likely to arise. Aggregate materials for the construction of the cabling route will be sourced locally to reduce the amount of emissions associated with vehicle movements.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Chapter 6: Biodiversity					
Pre-Commencement Phase					
MM44	Invasive Species Management	EIAR Section 6 CEMP Section 3	A pre-commencement survey for invasive species within the footprint of the Proposed Wind Farm Site will be carried out by a suitably qualified ecologist to ensure there is no new growth of Third Schedule invasive species in these areas.		
MM45	Fauna - Otter	EIAR Section 6	<p>Prior to the commencement of construction works associated with the installation of new watercourse crossings or water crossing works over the Blackwater River, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2007):</p> <ul style="list-style-type: none"> ➤ From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Development footprint, construction works which are likely to disturb otter will not proceed until a derogation licence is obtained. ➤ All conditions of a derogation licence will be implemented in full ➤ No works will be undertaken within 150m of any holts at which breeding females or cubs are present ➤ No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence (NRA, 20063). ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist. 		
MM46	Fauna - Bats	EIAR Section 6	<p>As described above, no roosts were identified within the footprint of the Proposed Development. However, a number of trees within the proposed transition compound were identified as having potential roost suitability. Therefore, the following mitigation is proposed:</p> <ul style="list-style-type: none"> ➤ A pre-commencement survey will be carried out by a suitably qualified ecologist prior to the felling of trees with potential roost features associated with the transition compound. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the surveys ➤ If a roost is identified during pre-commencement surveys, felling works of the trees in question will not be undertaken until a derogation is obtained. The need for a derogation licence has not been identified at this stage; however, should evidence of roosting bats be identified during the pre-commencement survey, a derogation will be required at that stage. ➤ Any trees identified as containing Potential Roost Features throughout the rest of the Proposed Development will be avoided and retained. <p>The following construction best practice will be employed to minimise general noise and disturbance potential. 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).</p> <p>Where lighting is required, directional lighting will be used to prevent overspill on to forestry edges. Exterior lighting during 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 be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.</p>		

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

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/23 Bats and artificial lighting at Night.</p> <p>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:</p> <ul style="list-style-type: none"> ➤ 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	Fauna - Badger	EIAR Section 6	<p>Prior to the commencement of construction works, the following measures will be undertaken for the avoidance of disturbance and to ensure no additional setts have been established since the original surveys undertaken. The following measures are in line with Guidelines For The Treatment Of Badgers Prior To The Construction Of National Road Schemes (TII 2009).</p> <ul style="list-style-type: none"> ➤ From a precautionary basis, a pre-commencement badger survey will be undertaken by a qualified ecologist in accordance with standard best practice guidance prior to the commencement of site works to ensure that no additional setts in close proximity to proposed infrastructure have been built. In the event that a badger sett is identified within or immediately adjacent to the Proposed Development footprint, mitigations as per the above referenced TII document will be implemented for the new sett. ➤ If any new setts are found within the vicinity of proposed infrastructure, mitigations as per the above mentioned TII document will be implemented to prevent disturbance of the sett. 		
MM48	Fauna – Red Squirrel and Pine Martin	EIAR Section 6	<p>Prior to the commencement of construction works, the following measures will be undertaken for the avoidance of disturbance and to ensure no dreys or dens have been established since the original surveys undertaken. The following measures are in line with Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA 2009).</p> <ul style="list-style-type: none"> ➤ From a precautionary basis, a pre-commencement survey will be undertaken by a qualified ecologist in accordance with standard best practice guidance prior to the commencement of site works to ensure that no red squirrel dreys or pine marten dens are present within or in close proximity to the infrastructure footprint. ➤ In the event that a red squirrel drey or pine marten den is identified within the Proposed Development footprint during pre-commencement surveys, further surveys will be undertaken to ascertain whether the drey/den is in use. Consultation will be carried out with NPWS and a Species Protection Plan as agreed by the project ecologist and NPWS will be put in place in advance of felling works. 		
Construction Phase					
MM49	Hedgerows and Treelines	EIAR Section 6 Appendix 6-5	<p>The Biodiversity Management Plan (Appendix 6-5) provides for the replanting of 1170m of native hedgerow within the lands to the southeast of the site in the vicinity of the proposed wind farm access road. This includes the replanting of hedgerows along the proposed new road.</p> <p>Additionally, the loss of treelines for the temporary transition compound located to the south of the Shannon Estuary will be mitigated post-construction through replanting of trees lost during restoration of the compound site. It is proposed to replant the trees being lost in their original locations. Advanced nursery stock will be planted in order to reduce the amount of time required to reach the age class of the trees being removed. The species to be planted will comprise poplar, willow, or hawthorn, or another native species that is found locally and which is suited to local soil conditions and to be being planted as advanced stock.</p> <p>The above measures are fully described in the Biodiversity Management Plan in Appendix 6-5.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM50	Wet Heath and Upland Blanket Bog	ElAR Section 6 Appendix 6-5	<p>The loss of 0.9ha of wet heath for the Proposed Development will be offset through the Biodiversity Management Plan which includes for the restoration of peatland habitats which are currently forested within the ElAR Site Boundary. This will involve felling an area measuring approx. 52.98ha and a bespoke management and monitoring plan for restoration of peatland within these areas. In addition, the selected areas will provide linkages and join up previously fragmented areas of peatlands in the vicinity of the ElAR Site Boundary which will support the objective of Article 10 of the Habitats Directive to maintain landscape connectivity for flora and fauna. The Biodiversity Management Plan (BMP) is provided as Appendix 6-5 to this ElAR.</p> <p>On completion of successful peatland restoration to peatland habitats, this will result in an additional area of approx. 52.98ha of peatland habitat as a result of the Proposed Development. The mitigation/restoration measures will be monitored over the lifetime of the Proposed Development as part of the BMP to determine their effectiveness and to allow for alteration in approaches where necessary.</p>		
MM51	Oak, Ash and Hazel Woodland	ElAR Section 6 Appendix 6-5	<p>The Biodiversity Management Plan includes for the replanting of approx. 0.9ha of oak-ash-hazel woodland around the proposed southeastern access road after completion of turbine blade delivery. This will be a linear woodland and will therefore be of a similar nature to that being lost. Details of this woodland replanting are provided in the Biodiversity Management Plan (Appendix 6-5).</p>		
MM52	Flora and Fauna	ElAR Section 6	<p>The operation of the Proposed Development will not result in any additional land take or loss of habitats and as such there is no potential for any significant effects in this regard. However, the Proposed Development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management (as described in the Biodiversity 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 Management Plan in Appendix 6-5.</p>		
Chapter 7 Birds					
Pre-Commencement Phase					
Construction Phase					
MM53	Birds	ElAR Section 7	<p>The following measures are proposed for the construction phase:</p> <ul style="list-style-type: none">➤ Construction will not commence until the forestry which hosted the 2023 hen harrier nest is no longer suitable for nesting hen harrier (please see Appendix 7-5, Figure 7.5.7). This is predicted to occur when the canopy closes. This measure to delay the onset of construction works, ensures the area remains undisturbed while the habitat is still suitable for nesting. This forestry was planted in 2018. It is considered that pre-thicket forestry is suitable for breeding hen harrier within the first ten years of planting, it is therefore considered that without intervention, this forestry block will become unsuitable for hen harrier in c. 2028. Before construction works can begin, habitat surveys must be undertaken to demonstrate that the forestry is no longer suitable for breeding hen harrier. The forestry must be confirmed to be unsuitable closed canopy forestry. These surveys will be conducted after the breeding season has ended (September/October) by a suitably qualified ornithologist, at the location of the 2023 hen harrier nest site, from 2026 onward, until it can be demonstrated that the forestry is no longer suitable for breeding hen harrier. The proposed development has been specifically designed to ensure other areas of suitable unaffected nesting habitat remain that could be utilised by the 2023 pair following canopy closure. This unaffected nesting habitat as previously outlined has been utilised for nesting previously and has been, by design, avoided and is buffered by 750m from the nearest turbine. Please see Appendix 7-5, Figure 7.5.28 for location details.➤ A Construction and Environmental Management Plan (CEMP) 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 ElAR. 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.➤ 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.➤ 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:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Oversee a pre-construction transect/walkover bird survey, to avoid significant effects on breeding birds will be avoided. ➤ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Development. <ul style="list-style-type: none"> ○ 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. 		
MM54	Birds – Hen Harrier Enhancement Measures	EIAR Section 7	<p>Permanent Forestry Removal and Restoration</p> <ul style="list-style-type: none"> ➤ The identified area of existing forestry will be permanently removed. The timber, brash and stumps will be collected and removed off-site. The area will be allowed to revert to peatland habitat. This process will be aided by drain blocking as discussed below. This will create suitable foraging habitat for hen harrier and its associated prey species. Pre-mature felling of forestry will be undertaken before the first breeding season of the construction phase of the project programme. This would allow time (i.e. min. three growing seasons) for the clear-felled site to revegetate in advance of the operational phase. Thereby ensuring replacement habitat would be available should the predicted displacement effect occur. ➤ A hydrology/hydrogeology study will be undertaken to map the movement of ground and surface water to inform the requirement for drain blocking. Forestry drainage channels will be blocked where necessary, using peat dams or plastic dams, as appropriate. In flat areas drain blocks should be placed every 15 metres and more frequently when accounting for a slope. When drains are blocked this reinstates the waterlogged conditions which are crucial for the survival of peatland plants. These works will be subject to a separate planning application if required. ➤ Self-seeding conifers originating as windblown seedlings from adjacent and nearby commercial conifer plantations, are a threat to the viability of the compensation and enhancement area. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for nesting/foraging hen harrier. Habitat maintenance of the area will involve the eradication of self-seeding conifers, and removal off-site. It is envisaged that the compensation areas will require maintenance twice during the life of the wind farm, once after approximately 10 and 20 years. The monitoring outlined in Section 5 below will monitor the level of encroachment by self-seeding conifers and will bring the scheduled removal forward as required. ➤ No invasive species were recorded onsite during the February 2020 site visit. A confirmatory pre-commencement survey for invasive species will be undertaken as part of preparatory work. In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species. ➤ Herbicides will not be used for the eradication of self-seeding trees and will not be relied upon for the clearance of invasive species. ➤ Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied. ➤ The felling license for these lands will be applied for in tandem with the felling license application that will be required to facilitate the construction of the wind farm within the proposed development area. The felling license will include management prescriptions for the felling of the forestry. Following felling, these compensation lands will be managed for the benefit of hen harrier and peatland restoration. ➤ If at any point, hen harrier are identified to be nesting on any part of the compensation or enhancement lands, the wind farm development company in cooperation with the individual landowner will provide for the protection of the nest site. ➤ The use of poisons or stupefying baits is not permitted within compensation or enhancement lands. Hen harriers and other birds of prey can fall victim to secondary and direct poisoning. ➤ Native vegetation around the perimeter of the northern plot, as well as a row of conifers along the southeastern boundary, will be retained as shown in Figure 3-2. The existing linear features as depicted will be gapped up using native tree and hedgerow species that are representative of the species present in the local area. <p>Scrub and Hedgerows</p> <ul style="list-style-type: none"> ➤ Habitat management prescriptions for scrub and hedgerows are outlined below: ➤ Retain existing areas of scrub and hedgerows; ➤ Where there is evidence of scrub or hedgerow removal (since 2016), these habitats will be reinstated as part of individual farm plans; ➤ Hedgerow/liner strips of scrub that occur along the road that intersects the management area will be widened to 3-4 metres by parallel planting of native hedgerow species; ➤ In open areas or where the extent of scrub and hedgerows is limited, create new areas of habitat; ➤ In open areas or where the extent of scrub and hedgerows is limited, allow expansion of native hardwood scrub; ➤ Trim established areas of gorse or willow scrub as the only means of preventing further encroachment onto grassland or access paths and tracks. Repeat annually as necessary; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Prevent any removal, burning or herbicide use on areas of established scrub; ➤ If deemed necessary for road safety reasons, cut roadside hedgerows outside of the bird nesting season (March 1st – August 31st); ➤ If deemed necessary for the protection of overhead electricity lines, cut hedgerows outside of the bird nesting season (March 1st – August 31st); ➤ Hedgerow maintenance is permitted to prevent the hedge “escaping”. In such cases, hedgerow trees should be left uncut, and the remainder of the hedgerow cut into an “A” shape, i.e. wider at the base than at the top; ➤ Encroachment of scrub onto grassland can be controlled by cutting on annual basis if required. Cutting in this case should not come closer than 1 metre from the base of the hedge; ➤ Herbicides and pesticides will not be used within 5 metres of an existing hedgerow; and ➤ Hedge cuttings will be piled into heaps and left to decay naturally. <p>Wet Grassland and Peatland</p> <ul style="list-style-type: none"> ➤ In general, maintain stocking levels of no greater than 0.15 livestock units (LU) per forage hectare; ➤ In the specific case of blanket bog maintain stocking levels of up to 0.10 LU/ha; ➤ No new forestry planting on the bog and heath areas within the enhancement area will be permitted; ➤ Self-seeded conifers invading open areas of bog and heath will be removed; ➤ Heath and bog habitats will be surveyed at least once every two years to ensure that new seedlings are removed; ➤ Participating landowners will remove any self-seeding conifers as they appear or as they are noticed and can also be removed by the windfarm development company as provided for in the farm plan agreements. ➤ On areas of wet grassland, the application of chemical or organic fertiliser will be prohibited; ➤ All rhododendron or other invasive species must be removed in Year 1 of the plan. Ongoing control will be required in each subsequent year. Acceptable control methods are cutting/pulling; ➤ Consideration will be given to the creation of shallow pools 30- 50 cm deep to provide spawning sites for amphibians; and ➤ In cases where the land is wet, concentrate grazing during the summer months. <p>Rush Management</p> <ul style="list-style-type: none"> ➤ In general, rushes will be cut on a 2-year cycle unless there are specific reasons for a longer cycle, e.g. weak rush growth. ➤ In most cases, active rush management will commence in year 1 of the plan and should only be delayed until year 2 or 3 where improved grassland is in reversion, where rush growth is very weak or where the rushes were cut or treated with herbicide in the year prior to joining the scheme. ➤ On farms with a large area of rushy wet grassland (> 10 hectares), active rush management can be delayed on a portion of the area until Year 2 of the farm plan. The area where active rush management is to be delayed for this reason should not normally exceed 50% of the wet grassland component of the farm. ➤ The planned rush management will be reviewed on an annual basis to determine if it is having the desired effect. If it is found during an annual inspection that rush recovery has been stronger or weaker than had been originally anticipated, the farm plan will be changed to adjust the cutting sequence for future years and provisions for these amendments will be included in the Farm plan management agreements. These details have been consented to by the consenting landowners. 		
EIAR Chapter 8 Land Soils & Geology					
Construction Phase					
MM55	Earthworks	EIAR Section 8	<ul style="list-style-type: none"> ➤ Placement of turbines and associated infrastructure in areas with shallower peat; ➤ 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; ➤ The Proposed Development has been designed to avoid sensitive habitats within the application area; ➤ A minimal volume of peat, subsoil and rock will be excavated and removed to allow for infrastructure works to take place in comparison to the total volume of these materials present on the site due to optimisation of the Proposed Development design; ➤ In general, excavated peat and spoil will be moved short distances from the point of excavation and will be used for landscaping or stored in the onsite borrow pits; and, ➤ Construction of settlement ponds will be volume neutral, and all excess material will be used locally to form pond bunds and surrounding landscaping. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM56	Peat and Spoil Management	EIAR Section 8	<ul style="list-style-type: none"> Excavation works will be undertaken and supervised by an experienced contractor and suitably qualified personnel; Rock will be removed by either breaking or blasting and will be determined by confirmatory ground investigations comprising of rotary core drilling; Borrow pits will be developed with stable ground inclinations; Exposed slopes will be left with irregular faces to promote re-vegetation; The stability of the rock faces will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability; Rock buttresses will be constructed within the borrow pits to help retain placed peat and spoil. The founding stratum for each buttress will be inspected and approved by the Project Geotechnical Engineer; Infilling of peat and spoil should commence at the back of the borrow pit and progress towards the pit entrance. 		
MM57	Contamination of Soil	EIAR Section 8	<ul style="list-style-type: none"> 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; All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; The 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; The plant used during construction will be regularly inspected for leaks and fitness for purpose; An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan. 		
MM58	Erosion of Exposed Subsoils and Peat during Construction	EIAR Section 8	<ul style="list-style-type: none"> Peat removed from the development locations and access roads will be reinstated within the Proposed Development site; The upper vegetative layer (where still present) will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored peat within the peat storage areas; Re-seeding and spreading/planting will also be carried out in these areas; Brash/bog mats will be put in place to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; and, A full Peat and Spoil Management Plan for the development is shown as Appendix 4-2 of the EIAR and details control measures for the removal, storage and general management of the materials to be excavated during construction. 		
MM59	Erosion of Exposed Subsoils and Peat during Tree Felling	EIAR Section 8	<p>All proposed felling works will be completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and DAFM guidance documents to ensure that felling results in minimal potential negative effects on the local peat, soil and subsoil environment.</p> <p>In addition, the following mitigation measures will be implemented during felling operations:</p> <ul style="list-style-type: none"> Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water run off; The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; All machinery will be operated by suitably qualified personnel; These machines will traverse the Wind Farm Site along specified off-road routes (referred to as racks); Brash mats will be placed on the racks to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; As felling progresses, the harvester will collect brash produced by the felling and place it in front of the machine before it advances forward along the rack; The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase; and, The location of racks will be chosen to avoid wet and potentially sensitive areas. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM60	Bog Restoration Works	EIAR Section 8	<p>Given the nature of the restoration measures the following mitigation measures are proposed:</p> <ul style="list-style-type: none"> ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water run off; ➤ Proposed off-road routes will be walked in advance of any machinery; ➤ All machinery operators will be experienced; ➤ The site will be walked before a machine goes off-road; ➤ Bog mats will be used where the excavator is required to travel over wet ground; and, ➤ A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils. 		
MM61	Peat Instability	EIAR Section 8	<p>The following control measures incorporated into the construction phase of the project will ensure the management of the risks for this site:</p> <ul style="list-style-type: none"> ➤ Appointment of experienced and competent contractors; ➤ The site will be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); ➤ Prevent undercutting of slopes and unsupported excavations; ➤ Maintain a managed robust drainage system; ➤ Prevent placement of loads/overburden on marginal ground; ➤ Set up, maintain and report findings from monitoring systems (as outlined in the Geotechnical and Peat Stability Assessment); ➤ Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor. The method statements will be in compliance with all guidance and control measures prescribed in the Geotechnical and Peat Stability Risk Assessment. This will ensure that best practice guidance regarding the management of peat stability will be inherent in the construction phase; ➤ Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction. ➤ Maintain hydrology of area by maintaining existing drains to prevent the build-up of water pressures in the peat, leading to the peat becoming “buoyant”; ➤ Use of experienced geotechnical staff for confirmatory site investigations; and, ➤ Use of experienced contractors and trained operators to carry out the work. 		
EIAR Chapter 9 Hydrology					
Pre-Commencement Phase					
MM62	Clear-felling of Coniferous Plantation	EIAR Section 9	<p>Mitigation by Avoidance: There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “Forestry and Water Quality Guidelines”.</p> <p>With moderate slopes existing across much of the Wind Farm Site, a 10m setback for felling will be established along all aquatic zones. Buffer zone widths will be increased at vulnerable hydrological features where deemed necessary. This will ensure water quality is protected during the felling operations. However, most of the Proposed Development infrastructure is located outside of the 50m hydrological buffer zone, thereby limiting the felling which will occur in close proximity to natural watercourses.</p> <p>The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:</p> <ul style="list-style-type: none"> ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the 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. <p>Mitigation by Design: Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; All machinery will be operated by suitably qualified personnel; Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicles through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; Machines will traverse the site along specified off-road routes (referred to as racks); The location of racks will be chosen to avoid wet and potentially sensitive areas; Brash mats will be placed on the racks to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall. An ECoW will monitor forecasts and determine when works should be suspended; Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during construction; Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff (refer to Pre-Emptive Site Drainage Management below); Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. <p>Pre-emptive Site Drainage Management:</p> <p>The works programme for the felling operations will also take account of weather forecasts and predicted rainfall in particular. Operations 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.</p> <p>The following forecasting systems are available and will be used on a daily/weekly basis and reviewed by an EcoW, as required, to allow site staff to direct proposed and planned construction activities:</p> <ul style="list-style-type: none"> 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 patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; Rainfall Radar Images: Images covering the entire country are freely available from the Met 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, 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. 		
MM63	Earthworks	EIAR Section 9	<p>Mitigation by Avoidance:</p> <p>The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will:</p> <ul style="list-style-type: none"> Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Avoid excavations within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from earthworks into watercourses; and, ➤ Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. <p>Mitigation by Design: Key mitigation by design measures that will be implemented comprise source controls, in-line controls and treatment systems, as follows:</p> <ul style="list-style-type: none"> ➤ Source controls: <ul style="list-style-type: none"> ○ Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. ○ Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures. ➤ In-Line controls: <ul style="list-style-type: none"> ○ Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. ➤ Treatment systems: <ul style="list-style-type: none"> ○ Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. <p>It should be noted for this Wind Farm Site that an extensive network of forestry and roadside drains already exists, and these will be integrated and enhanced as required and used within the wind farm development drainage system. The integration of the existing forestry drainage network and the proposed wind farm network is relatively simple. The key elements being the upgrading and improvements to water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.</p> <p>The main elements of interaction with existing drains will be as follows:</p> <ul style="list-style-type: none"> ➤ Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the proposed wind farm drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion; ➤ Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; ➤ Runoff from individual turbine hardstanding areas will not be discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; ➤ Buffered outfalls which will be numerous over the site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site; and, ➤ Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. 		
MM64	Works within Hydrological Buffer Zones	EIAR Section 9	<p>Mitigation Measures by Avoidance: The above mitigation measures will be implemented at these work locations. The following additional mitigation measures will also be implemented:</p> <ul style="list-style-type: none"> ➤ Double silt fences will be placed downgradient of all work locations within the hydrological buffer zones. ➤ All works will be completed during the summer months and works will be postponed in the event of heavy rainfall. 		
MM65	Dewatering	EIAR Section 9	<p>Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:</p> <ul style="list-style-type: none"> ➤ Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; ➤ If required, following periods of heavy rainfall, pumping of excavation inflows will prevent build-up of water in the excavation; ➤ The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> > 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; > The borrow pit settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is highest level of protection recommended by the EPA with regard to retention time; > There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; > Daily monitoring of excavations by 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 undertaken; and, > A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed. 		
MM66	Hydrocarbons and Cement Based Products	EIAR Section 9	<p>Mitigation measures to be implemented to avoid release of hydrocarbons at the Proposed Development site are as follows:</p> <ul style="list-style-type: none"> > All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Proposed Development site. > On site re-fuelling of machinery will be carried, as required, out using a mobile double skinned fuel bowser: <ul style="list-style-type: none"> ○ 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. ○ The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. ○ The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. ○ Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; > Onsite refuelling will be carried out by trained personnel only; > A permit to fuel system will be put in place; > Fuels stored on site will be minimised. Fuel storage areas if 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. > No batching of wet-cement products will occur on the Wind Farm Site. Ready-mixed supply of wet concrete products and/or emplacement of pre-cast elements will take place; > 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 the Wind Farm Site, only the 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 is to be isolated in temporary lined wash-out pits located near proposed wind farm site compound. These temporary lined wash-out pits will be removed from the wind farm site at the end of the construction phase; > The contractor will use weather forecasting to plan dry days for pouring concrete; and, > The contractor will ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event. 		
MM67	Wastewater Disposal	EIAR Section 9	<ul style="list-style-type: none"> > During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site compounds, maintained by the providing contractor, and removed from site on completion of the construction works; > Water supply for the site office and other sanitation will be brought to site and removed after use from the Wind Farm Site to be discharged at a suitable off-site treatment location; and, > No water or wastewater will be sourced on the site, nor discharged to the site. 		
MM68	Stream Crossings	EIAR Section 9	The Proposed Development design has been optimised to utilise the existing infrastructure (i.e. existing site roads) where practicable. 1 no. crossings is proposed along existing site tracks with a total of 5 no. new crossings proposed. This design prevents the unnecessary disturbance of the existing site drainage network prevents the requirement for widespread instream works across the Wind Farm Site.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Mitigation measures to be implemented for the upgrade of the existing crossings and the new proposed crossing are detailed below:</p> <ul style="list-style-type: none"> ➤ 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; ➤ Where the proposed underground cabling route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road; ➤ As a further precaution near stream construction work will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites”, that is, May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses; ➤ During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed on-site; and, ➤ All new road river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent. <p>Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed:</p> <ul style="list-style-type: none"> ➤ All existing roadside drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps; ➤ Culverts, manholes and other drainage inlets will also be temporarily blocked; <p>A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside the watercourse 50m buffer zone. The following mitigation measures are proposed for the Grid Connection crossing works:</p> <ul style="list-style-type: none"> ➤ No stockpiling of construction materials will take place along the grid route; ➤ No refuelling of machinery or overnight parking of machinery is permitted in this area (within 50m of the watercourse crossings); ➤ No concrete truck chute cleaning is permitted in this area (within 50m of the watercourse crossing); ➤ Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; ➤ Local road drainage, culverts and manholes will be temporarily blocked during the works; ➤ Machinery deliveries will be arranged using existing structures along the public road; ➤ All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur; ➤ Any excess construction material will be immediately removed from the area and sent to a licenced waste facility; ➤ No stockpiling of materials will be permitted in the constraint zones; ➤ Spill kits will be available in each item of plant required to complete the stream crossing; and, ➤ Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. 		
MM69	Surface Water Effects during Directional Drilling along the Grid Connection	EIAR Section 9	<p>Proposed Mitigation Measures:</p> <ul style="list-style-type: none"> ➤ Although no in-stream works are proposed, the 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 (drier) 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; ➤ 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; ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; Spills of drilling fluid will be cleaned up immediately and 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 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; 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 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 at the watercourse crossing; There will be no refuelling allowed within 50m of the watercourse crossing; and, All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing. 		
Chapter 10 Air Quality					
Construction Phase					
MM70	Exhaust Emissions	EIAR Section 10	<ul style="list-style-type: none"> All construction vehicles and plant used onsite during the construction phase will be maintained in good operational order. If a vehicle requires repairs this work will be carried out at an appropriate offsite location, thereby minimising any emissions that arise. Turbines components will be transported to the Wind Farm Site on specified routes only (see Chapter 15 Material Assets), unless otherwise agreed with the Planning Authority. All machinery and vehicles will be switched off when not in use and not left idling. The majority of aggregate materials for the construction of the Proposed Development will be obtained from the borrow pits on site. This will significantly reduce the number of delivery vehicles accessing the Wind Farm Site, thereby reducing the amount of emissions associated with vehicle movements. Deliveries of aggregate materials that cannot be source from the onsite borrow pits will be sourced from local quarries which will reduce the distance of these deliveries, thereby reducing the effect to traffic and transport in the wider area. The Materials Recovery Facility (MRF) f will be as close as possible to the Wind Farm Site and Grid Connection to reduce the amount of emissions associated with vehicle movements. 		
MM71	Dust Emissions	EIAR Section 10 CEMP Section 3	<ul style="list-style-type: none"> 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 will be carried out along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, , increased runoff. All plant and materials vehicles for the Proposed Development will be stored in dedicated areas within the Wind Farm Site. Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. Turbines and construction traffic will be transported to the Wind Farm Site on specified haul routes only. Grid Connection infrastructure will be transported to the Grid Connection on specified haul routes only. Construction materials for the proposed Grid Connection and a small volume for the proposed Wind Farm Site will be sourced locally from licenced quarries. The agreed haul route road adjacent to the Wind Farm Site will be checked weekly by the Site Manager for cleanliness and cleaned as necessary. The roads adjacent to the Wind Farm Site entrances will be checked weekly for damage/potholes and repaired as necessary. The transportation of materials from the borrow pits around the Wind Farm Site will be covered by tarpaulin or similar covered vehicles. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> > The transportation of construction materials from locally sourced quarries for the proposed Grid Connection infrastructure and a small volume for the proposed Wind Farm Site will be covered by tarpaulin . > In periods of extended dry weather, excavated material will be dampened prior to transport to the spoil management areas. > Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by an appropriately licensed waste contractor. The MRF facility will be local to the Proposed Development to reduce the amount of emissions associated with vehicle movements 		
ELIAR Chapter 11 Climate					
Construction Phase					
MM72	Greenhouse Gas Emissions	EIAR Section 11	<ul style="list-style-type: none"> > All construction vehicles and plant will be maintained in good operational order while onsite. If a vehicle requires repairs, this work will be carried out, thereby minimising any emissions that arise. > When stationary, delivery and on-site vehicles will be required to turn off engines. > Users of the Site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum. > Turbines and construction materials will be transported to the Site on specified routes only unless otherwise agreed with the Planning Authority. > The majority of aggregate materials for the construction of the Proposed Development will be obtained from on-site borrow pits. This will significantly reduce the amount of emissions associated with vehicle movements. > The Materials Recovery Facility (MRF) will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the site is Clare Waste & Recycling Company Limited, Raheen Rd, Raheen, Tuamgraney, Co. Clare which is located approximately 21km to the east of the site. > Waste associated with the construction of the Grid Connection underground electrical cabling route will be disposed of at the closest MRF to where waste is generated along the underground electrical cabling route. > Where applicable, low carbon intensive construction materials will be sourced and utilised onsite. 		
ELIAR Chapter 12 Noise and Vibration					
Construction Phase					
MM73	Construction Noise	EIAR Section 12	<p>Regarding construction activities, reference will be made to BS 5228-1:2009+A1:2014 <i>Code of practice for noise and vibration control on construction and open sites – Noise</i>, which offers detailed guidance on the control of noise & vibration from demolition and construction activities. The following measures will be adopted during construction:</p> <ul style="list-style-type: none"> > Managing the hours according to the CEMP [Appendix 4-3] 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. <p>Furthermore, a variety of practicable noise control measures will be employed. These include:</p> <ul style="list-style-type: none"> > Selection of plant with low inherent potential for generation of noise and/ or vibration; > Placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints, and; > Regular maintenance and servicing of plant items. <p>The following list of measures will be implemented on site, to ensure compliance with the relevant construction noise criteria:</p> <ul style="list-style-type: none"> > 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> > 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 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. <p>Where rock breaking is employed, the following are examples of measures that will be employed, to mitigate noise emissions from these activities:</p> <ul style="list-style-type: none"> > 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. > 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. <p>The methods used to minimise complaints could consist of some or all of the following:</p> <ul style="list-style-type: none"> > Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). > Notification to nearby residents before blasting starts (e.g. 24-hour written notification). > The firing of blasts at similar times to reduce the 'startle' effect. > On-going circulars informing people of the progress of the works. > The implementation of an onsite documented complaints procedure. > The use of independent monitoring by external bodies for verification of results. > Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence. <p>In respect of the grid connection construction, a temporary solid hoarding will be employed where there are NSLs less than 40m to the activity. This can be expected to reduce noise at the NSL by 5 - 10 dB. With this mitigation measure in place, the resulting noise effect is negative, not significant and brief to temporary.</p> <p>Additional or alternative mitigation measures include:</p> <ul style="list-style-type: none"> > Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; > Selection of plant with low inherent potential for generation of noise and/ or vibration, and; > Placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints. 		
MM74	Vibration	EIAR Section 12	<p>Specific to blasting the following mitigation measures will be employed to control the impact during blasts:</p> <ul style="list-style-type: none"> > Trial blasts may be undertaken to obtain scaled distance analysis; > Ensuring appropriate burden to avoid over or under confinement of the charge; > Accurate setting out and drilling; > Appropriate charging; > Appropriate stemming with appropriate material such as sized gravel or stone chipping; > Delay detonation to ensure small maximum instantaneous charges; > Decked charges and in-hole delays; > Blast monitoring to enable adjustment of subsequent charges; > Good blast design to maximise efficiency and reduce vibration; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			> Avoid using exposed detonating cord on the surface.		
EIAR Chapter 13 Cultural Heritage					
Construction Phase					
MM75	Recorded Monuments at the Wind Farm Site	EIAR Section 13	<p>One recorded monument is located within the proposed Wind Farm Site. It comprises a megalithic tomb – wedge tomb (CL044-068—) situated c. 22m east of an existing forestry track. The tomb is situated c. 347m SE of T4, c. 428m SW of T6 and c. 355m NW of T7. The nearest proposed infrastructure comprises the proposed new road to T7 which is located c. 77m to the east. While no direct effects to the monument are identified some mitigation is proposed in order to avoid accidental damage to the tomb during the construction stage of the Proposed Development.</p> <p>Mitigation measures:</p> <ul style="list-style-type: none">> A buffer zone measuring 30m will be established around megalithic tomb CL044-068— prior to the commencement of construction works. The buffer will comprise durable temporary fencing with ‘keep out’ signage. The requirement for the buffer zone and associated signage will be included in the CEMP.> No ground works or storage of materials or tracking of machinery will take place within the buffer zone.		
MM76	Recorded Monuments along the Grid Connection	EIAR Section 13	<p>Five recorded monuments are located within 100m of the proposed Grid Connection route. No direct effects to the monuments themselves are identified. The proposed Grid Connection route extends through the Zone of Notification for three of the recorded monuments and therefore mitigation measures will be implemented during construction works in order to avoid any potential negative effects arising during such works.</p> <p>Mitigation Measures:</p> <ul style="list-style-type: none">> The proposed Grid Connection will extend along and within the east side of the public road where it extends past church and graveyard CL053-032001- and 002- in order to avoid potential direct effects to any sub-surface archaeological features which may exist in this area.> Archaeological monitoring will be carried out along the relevant sections of the underground electrical cabling route where the latter extends through the ZoN for monuments CL053-032001- and 002- Church and graveyard and CL053-031— Enclosure.> A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority.> Further mitigation including preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.		
MM77	Works along the Turbine Delivery Route	EIAR Section 13	<p>The proposed overrun area at Aharinaghbeg townland is located within the Zone of Notification for recorded monument CL053-007— Enclosure. At its closest point the works will measure c. 13m from the outer extent of the enclosure. No works to the monument itself will take place. Given the proximity to the monument, however, and the location of the works within the Zone of Notification for same mitigation measures are recommended in order to avoid any accidental damage to the monument.</p> <p>Mitigation Measures:</p> <ul style="list-style-type: none">> A buffer zone of 10m will be established around recorded monument CL053-007— Enclosure prior to the commencement of any works. The buffer will comprise durable temporary fencing with ‘keep out’ signage. The requirement for the buffer zone and associated signage will be included in the CEMP.> Archaeological monitoring of any ground works associated with the works along the TDR within the ZoN for recorded monument CL053-007— Enclosure.> A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority.> Further mitigation including preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.		
MM78	Sub Surface Archaeological Potential	EIAR Section 13	<ul style="list-style-type: none">> Pre-development archaeological testing of proposed infrastructure will be carried out under licence from the National Monuments Service. Given that the Site is largely under coniferous forestry plantations it is proposed that the archaeological testing will be carried out after the necessary clear-felling of forestry has taken place. This will ensure adequate machine access to all areas of proposed infrastructure in order to facilitate the programme of archaeological testing.> A report on the testing will be compiled on completion of the work and submitted to the NMS and the Planning Authority.> Further mitigation including preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Archaeological monitoring of all groundworks during the construction stage of the Proposed Development by a licensed archaeologist. ➤ A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. ➤ Further mitigation including preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring. ➤ Pre-development archaeological testing of the proposed overrun areas at Kilmore townland and at the proposed temporary transition compound will be carried out under licence from the National Monuments Service. ➤ A report on the testing will be compiled on completion of the work and submitted to the NMS and the Planning Authority. ➤ Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing. 		
MM79	Newly Recorded Monuments	EIAR Section 13	<ul style="list-style-type: none"> ➤ A walk-over survey of the proposed Wind Farm following clear-felling of dense forestry will be carried out by a suitably qualified archaeologist. ➤ A report on the walk-over survey will be compiled on completion of same and will detail the nature and location of any potential archaeological sites/monuments identified. ➤ Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) or buffer zones may be required depending on the results of the walk-over survey. 		
MM80	Features of Local Cultural Heritage Merit	EIAR Section 13	<ul style="list-style-type: none"> ➤ A buffer zone of 20m will be established around ruinous stone structure CH1 prior to the commencement of any works. The buffer will comprise durable temporary fencing with 'keep out' signage. The requirement for the buffer zone and associated signage will be included in the CEMP. ➤ No ground works or storage of materials or tracking of machinery will take place within the buffer zone. ➤ A photographic and descriptive record of a sample of field boundaries impacted by construction works associated with the development will be carried out by the monitoring archaeologist and included in the monitoring report. 		
Chapter 15 Material Assets					
Construction Phase					
MM81	Services	EIAR Chapter 15	<p>The mitigation measures include the following:</p> <ul style="list-style-type: none"> ➤ Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. ➤ Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. ➤ Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. ➤ The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks. 		
MM82	Waste Generation	EIAR Chapter 15	<p>The following mitigation measures will be implemented:</p> <ul style="list-style-type: none"> ➤ 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 Proposed Development site. Therefore, all wastes 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 closest, authorised municipal waste facility is located approximately 9.2km south of the Proposed Development site, at Limerick City, Co. Limerick. ➤ Extensive waste categorisation will be in place to ensure the highest possible quality of recycling of the respective categories and to prevent an accumulation of pollutants in the material cycle – it is anticipated that the following waste types, at a minimum, will be segregated: <ul style="list-style-type: none"> ○ Electrical Waste ○ Plastics; ○ Oils; ○ Metals; ○ Glass; and ○ Timber. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ To minimise the generation of waste and waste disposed to landfill, wastes will be managed in accordance with the waste hierarchy and relevant regulatory controls. ➤ Waste will be clearly labelled and segregated on site. Measures will be taken to ensure that wastes cannot blow away. ➤ Housekeeping measures will be followed for the storage of materials to ensure that materials are protected as much as possible. ➤ All waste materials will be stored in skips or other suitable receptacles in designated areas of the site. ➤ Any hazardous wastes generated (such as chemicals, fuels and oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required). ➤ A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the construction works. ➤ All staff will be provided with training regarding the waste management procedures; ➤ All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal. ➤ All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and ➤ All waste leaving the site will be recorded and copies of relevant documentation maintained. As a minimum, the following waste management data will be provided: <ul style="list-style-type: none"> ○ Quantity of materials and waste removed from site by type in volume and weight. ○ Outcome of the materials and waste on and off site. ○ Waste transfer notes. ○ Hazardous waste consignment notes. 		
Chapter 15 – Traffic					
Construction Phase					
MM83	Traffic	EIAR Section 15	<p>Mitigation by Design:</p> <p>Mitigation by design measures include the following;</p> <ul style="list-style-type: none"> ➤ Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.8 of the EIAR. ➤ Implementation of temporary alterations to the highway network at locations identified in Section 15.1.8 of the EIAR. <p>Mitigation Measures During the Construction Stage:</p> <p>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 and Grid Connection.</p> <p>Delivery of abnormal sized loads</p> <p>The following are the main points to note for these deliveries. These will take place after peak evening traffic:</p> <ul style="list-style-type: none"> ➤ The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. ➤ The deliveries will be made in consultation with the Local Authority and An Garda Síochána. ➤ It is estimated that 72 abnormal sized loads will be delivered to the site, comprising 15 convoys of 5, undertaken over 15 separate nights. ➤ These nights will be spread out over an approximate period of 3 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Other Traffic Management Measures</p> <p>A Traffic Management Plan (TMP) is provided specifying details relating to traffic management and is included as Appendix 15-2 the EIAR. 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. In the event An Bord Pleanála decides to grant consent for the Proposed Development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Board. The TMP prescribes the following:</p> <ul style="list-style-type: none">➤ 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 relevant County Councils (Clare and Limerick) in advance of deliveries of turbine components to site. Liaison with the 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.➤ Temporary traffic management measures during construction of Wind Farm Site at access junctions during construction – Temporary measures including signage at access Junctions B at Sallybank, C and D at Snaty.➤ Temporary traffic management measures during construction of Grid Connection – Including signage and implementation of temporary traffic diversions.➤ Temporary traffic signs and traffic management measures for the construction phase of the proposed temporary transition compound on the N69 – As part of the traffic management measures temporary traffic signs will be put in place at the access points for the transition zone located on the N69. All measures will be in accordance with the “<i>Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works</i>” (DoT now DoTT&S) and “Guidance for the Control and Management of Traffic at Roadworks” (DoTT&S). Construction staff (flagman) will be present at key junctions during peak delivery times. This will include a request to TII / LC&CC for a temporary speed reduction for the 85 day construction period.➤ 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 Authorities, a pre-condition survey of roads associated 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. 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 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 relevant Roads Sections will be informed of the 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 15.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable.➤ Identification of delivery routes – These routes will be agreed with the County Councils and adhered to by all contractors.➤ Delivery times of large turbine components - The management plan will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.➤ Travel plan for construction workers – While the assessment above has assumed the worst case in that construction workers will drive to the site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the site.➤ Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required.➤ Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		

EIAR Monitoring Measures

Table 18-2 Monitoring Schedule

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Forestry Felling Drainage Management	EIAR Section 4	<p>Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) will be appointed to oversee the keyhole felling and extraction works. The ECoW will have the following functions:</p> <ul style="list-style-type: none"> Attend the site for the setup period when drainage protection works are being installed and be present on site during the remainder of the forestry keyhole felling works. Prior to the commencement of works, review and agree the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals (see further below). Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works. Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements (DAFM, 2008). Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures. Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements: <ul style="list-style-type: none"> Surface water samples shall be collected upstream and downstream of the keyhole felling site at suitable sampling locations. Sampling shall be taken from the stream / river bank, with no in-stream access permitted. The following minimum analytical suite shall be used: pH, Electrical Conductivity, Total Suspended Solids, Biochemical Oxygen Demand, Total Phosphorus, Ortho-Phosphate, Total Nitrogen, and Ammonia. Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions. Prepare and maintain a contingency plan. Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed. Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW. 	As Required	Weekly	ECoW
MX2	Drainage Maintenance and Inspection	EIAR Section 9	<p>An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken by the ECoW, 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. Inspections will also be undertaken after tree felling.</p> <p>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. Checks will be carried out on a daily basis.</p>	As Required	Weekly	ECoW
MX3	Invasive Species	EIAR Section 6 CEMP Section 3	<p>A pre-commencement survey for invasive species within the footprint of the Proposed Wind Farm Site will be carried out by a suitably qualified ecologist to ensure there is no new growth of Third Schedule invasive species in these areas.</p> <p>If additional invasive species are recorded within the construction areas, an Invasive Species Management Plan will be prepared in advance of construction which will incorporate the measures necessary to prevent spread additional to the measures laid out below.</p>	Once	As required	Project Ecologist
MX4	Flora and Fauna - Otter	EIAR Section 6	A pre-commencement confirmatory otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works.	Once	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX5	Flora and Fauna - Badger	EIAR Section 6	From a precautionary basis, a pre-commencement badger survey will be undertaken by a qualified ecologist in accordance with standard best practice guidance prior to the commencement of site works to ensure that no additional setts in close proximity to proposed infrastructure have been built. In the event that a badger sett is identified within or immediately adjacent to the Proposed Development footprint, mitigations as per the above referenced TII document will be implemented for the new sett.	Once	As Required	Project Ecologist
Construction Phase						
MX6	Drainage Maintenance and Inspections	CEMP Section 3 CEMP Section 4	<p>Routine inspections of construction activities will be carried out on a daily and weekly basis by the ECoW and the Site Supervisor/Construction Manager to ensure all controls to prevent environmental impacts, relevant to the construction activities taking place at the time, are in place.</p> <p>Environmental inspections will ensure that the works are undertaken in compliance with this CEMP and all other planning application documents. Only suitably trained staff will undertake environmental site inspections.</p> <p>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.</p> <p>Regular inspections (weekly and monthly) of all installed drainage features will be undertaken. Additional event based inspections will also be completed, i.e. after heavy rainfall in order to check for blockages and to ensure there is no build-up of standing water at parts of the drainage systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the supervising hydrologist.</p>	Daily/Weekly	As Required	ECoW
MX7	Roles and Responsibilities	CEMP Section 4	<p>In general, the ECoW will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters by reporting to and liaising with Clare County Council and other statutory bodies as required.</p> <p>The main contractor will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW), and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.</p>	As Required	Weekly	ECoW
MX8	Project Hydrologist	CEMP Section 4	Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, and in relevant planning conditions.	As Required	Weekly	ECoW
MX9	Project Geotechnical Engineer	CEMP Section 4	<ul style="list-style-type: none"> ➤ Visit site regularly, or at least once a month during the construction phase, to complete geotechnical audits and reviews and report any issues to the Site Supervisor/Construction Manager; ➤ Ensuring that identified hazards are listed in the Construction Risk Register and that these are subject to ongoing monitoring; and, ➤ Ongoing inspection and monitoring of the development, particularly in areas of peatland and the temporary stockpile areas, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, NIS and in relevant planning conditions. 	Monthly	Monthly	Project Geotechnical Engineer

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX10	Birds	EIAR Section 7	<p>Pre-commencement surveys will be undertaken prior to the initiation of any site clearance or enabling works at the Wind Farm Site, with particular attention focused on previously identified hen harrier nest/roost locations. The phasing and programming of construction work will be reviewed by the contractor in consultation with the developer and their ecological advisors in light of the results of the pre-commencement bird surveys. If an active nest / roost location of a protected Annex 1 species are discovered, no works shall be undertaken within a species-specific buffer (Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) in line with best practice. The Ecological Clerk of Works (ECoW) will liaise with and seek advice on suitable buffer distances with an ornithologist. The ECoW will be responsible for demarcating and monitoring observance of the exclusion zones as well as communicating the location of the exclusion zones to site staff on an ongoing basis. The ECoW should carry out at a minimum daily checks of exclusion zones to ensure there is no incursion into these areas.</p> <p>During the construction phase focused breeding season monthly surveys (March to August inclusive) of historical hen harrier nest sites and all suitable habitat within 750 m of the development footprint and/or all works areas will be carried out. The survey methods will follow that outlined in NatureScot (2019) guidance on raptor searches. Vantage point watches will be carried out over areas of suitable hen harrier breeding habitat to locate any active nests by an Ornithologist. The ornithologist will be required to submit written records of survey work completed and findings to the client / client's representative on a monthly basis. Findings that require immediate action will be conveyed to the client / client's representative and the contractor as soon as the issue arises by phone followed thereafter by written advice. All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be clearly marked off to alert all personnel on site to the suspension of works within that area.</p> <p>The ornithological monitoring programme may require amendment or adaptation from time to time during the construction phase in response to changes in the baseline environment where species, particularly hen harrier, are discovered to be using areas of the site or adjacent to the site that were previously not used. Any changes to the monitoring programme will be notified and agreed with the client / client representative and will be clearly documented by the ECoW, specialist ornithologist, contractor and client / client's representative.</p>	As required	As required	Project Ornithologist
MX11	Plant and Equipment Inspections	EIAR Section 9 CEMP Section 4	The plant used during construction will be regularly inspected for leaks and fitness for purpose	As Required	Monthly	ECoW
MX12	Excavation Dewatering	EIAR Section 9	Daily monitoring of excavations 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 undertaken	Daily	Daily	EcoW/Suitably qualified person
MX13	Dust	EIAR Section 5	In periods of extended dry weather, dust suppression will be implemented along haul roads to ensure dust does not cause a nuisance. 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 by the environmental clerk of works, as the application of too much water may lead to increased runoff.	As required	As required	ECoW
MX14	Surface Water Quality during Directional Drilling	EIAR Section 9	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.	Daily	Daily	EcoW/Suitably qualified person
MX15	Clear Felling of Coniferous Plantation	EIAR Section 8	<p>Surface Water Quality Monitoring</p> <p>Sampling will be completed by the ECoW before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).</p> <p>Criteria for the selection of water sampling points include the following:</p>	As required	As required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			<ul style="list-style-type: none"> > Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses; > Select sampling points upstream and downstream of the forestry activities; > It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; > Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, > The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. <p>Also, daily surface water monitoring forms will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.</p>			
MX16	Underground Cabling	EIAR Section 12	<p>In respect of the Grid Connection construction, a temporary solid hoarding will be employed where there are NSLs less than 40m to the activity. This can be expected to reduce noise at the NSL by 5 - 10 dB. With this mitigation measure in place, the resulting noise effect is negative, not significant and brief to temporary.</p> <p>Additional or alternative mitigation measures include:</p> <ul style="list-style-type: none"> > Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; > Selection of plant with low inherent potential for generation of noise and/ or vibration, and; > Placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints. 	As required	As required	Acoustician
MX17	Proposed Grid Connection Archaeological Monitoring	EIAR Section 13 CEMP Section 2.4	<ul style="list-style-type: none"> > The proposed Grid Connection will extend along and within the east side of the public road where it extends past church and graveyard CL053-032001- and 002- in order to avoid potential direct effects to any sub-surface archaeological features which may exist in this area. > Archaeological monitoring will be carried out along the relevant sections of the underground electrical cabling route where the latter extends through the ZoN for monuments CL053-032001- and 002- Church and graveyard and CL053-031— Enclosure. > A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. > Further mitigation including preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring. 	As required	As required	Project Archaeologist
MX18	Proposed Turbine Delivery Route Archaeological Monitoring	EIAR Section 13 CEMP Section 2.4	<ul style="list-style-type: none"> > Archaeological monitoring of any ground works associated with the works along the Turbine Delivery Route within the ZoN for recorded monument CL053-007— Enclosure. > A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. > Further mitigation including preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring. 	As required	As required	Project Archaeologist
MX19	Archaeological Monitoring at Proposed Wind Farm	EIAR Section 13 CEMP Section 2.4	<ul style="list-style-type: none"> > Archaeological monitoring of all groundworks during the construction stage of the Proposed Development by a licensed archaeologist. > A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. > Further mitigation including preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring. 	As required	As required	Project Archaeologist
MX20	Archaeological Monitoring of Features of	CEMP Section 2.4	<ul style="list-style-type: none"> > A photographic and descriptive record of a sample of field boundaries impacted by construction works associated with the development will be carried out by the monitoring archaeologist and included in the monitoring report. 	As required	As required	Project Archaeologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	Local Cultural Heritage Merit	EIAR Section 13				
Operational Phase Monitoring						
MX21	Birds	EIAR Section 7	<p>These surveys will aim to monitor ongoing hen harrier activity within the wind farm. A comprehensive survey scope is proposed in this regard. Survey methods employed for operational monitoring will be in line with guidelines issued by the Scottish Natural Heritage (SNH, 2009). operational monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm. Operational monitoring will include vantage point surveys, breeding bird surveys to monitor hen harrier activity and a programme of regular corpse searching of birds that may potentially collide with operating turbines during the operational phase of the wind farm project. The following individual components are proposed:</p> <ul style="list-style-type: none">➤ Monthly flight activity surveys: vantage point surveys.➤ Breeding Bird surveys: hen harrier 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. <p>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.</p> <p>In addition to the outlined bird surveys, annual monitoring of the compensation and enhancement lands will be undertaken. Please refer to Appendix 6-5 for details.</p>	Various	As required	Project Ornithologist
MX22	Birds	EIAR Section 7	<p>During monitoring years, operational breeding bird surveys will be conducted to monitor hen harrier breeding activity at the Wind Farm Site. Survey methodology will be similar to methods employed for baseline EIAR surveys which will allow a comparison of data to be made for each monitoring year.</p> <p>The timing of visits will follow the recommendations of Hardey <i>et al.</i> (2013). Surveys will be conducted over areas of suitable breeding habitat for hen harrier to establish breeding territories present within the Wind Farm Site. A total of four site visits will be undertaken during the bird breeding season for each monitoring year and timed to coincide with the core breeding period April - July. The number of surveys days required per visit will be established based on requirements to establish hen harrier territories within the Wind Farm Site. Notes will be recorded on nesting and territorial behaviour and breeding signs using standard BTO codes. Non-breeding behaviour such as birds flying over the site will also be recorded.</p>	As required	As required	Project Ornithologist
MX23	Birds	EIAR Section 7	<p>The compensation and enhancement lands for hen harrier will be the subject of annual monitoring to assess the effectiveness of the measures proposed and employed and to contribute to advances in habitat management methods, which can be applied to future similar projects. The monitoring can also aid adaption and implementation of improved methods and measures as they emerge, or intensification of successful measures deployed from farm plan to farm plan.</p> <p>The monitoring measures will include as relevant:</p> <ul style="list-style-type: none">➤ The areas proposed for compensation and enhancement will be the subject of ongoing monitoring during the operational phase of the wind farm to ensure it is offering supporting habitat for breeding hen harrier. The ongoing monitoring will take place during the breeding bird season. The monitoring will seek to identify whether hen harrier are utilising the areas under active management for foraging and will be conducted by way of vantage point surveys (six hours in duration). These surveys will be undertaken once a month March to August inclusive, each year.	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			<ul style="list-style-type: none"> Passerine point counts will be undertaken monthly from April to September inclusive in each monitoring year at each of the compensation and enhancement areas. The monitoring aims to investigate to what extent enhancement measures e.g. seed crops, increase the availability of prey species for hen harrier. These surveys will be conducted each year. Areas of favourable hen harrier foraging habitat (i.e. scrub, blanket bog, wet heath and heather banks) within the compensation and enhancement areas should be accurately mapped and should be monitored annually to check that the areas so covered have not altered in size and that the grazing regime that is in place is maintaining the current state of these habitats (i.e. neither poaching nor overgrowth of open areas is occurring). As well as mapping, this monitoring will be recorded by means of fixed-point photography. Vegetation sampling: A number of fixed relevé sites (i.e. permanent quadrats) will be set up in the compensation and enhancement areas. Data will be recorded prior to the commencement of habitat enhancement activities. The character of each relevé will be recorded (e.g. species proportions present using Domin scale, vegetation structure) and photographs will be taken of each relevé from a fixed point. These relevés will then be re-examined yearly following commencement of the plan in place to establish the extent of habitat improvement resulting from management practices. <p>Following commencement of the plan, the efficacy of the enhancement measures will be reviewed yearly. Analysis of the data collected will be the basis for a review of the measures and techniques employed. This analysis will be contained in an annual report. Should any adjustments to the plan be deemed necessary or advisable, these should be undertaken in consultation with the NPWS prior to any alterations to the plan.</p> <p>Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared and submitted to the planning authority yearly following commencement of the plan. The farm plan agreements and enhancement area plan agreements will provide for such amendments.</p>			
MX24	Bats	EIAR Section 6	<p>As per NIEA and NatureScot Guidance, at least 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. For example, it may be that the construction of wind turbines reduces bat activity patterns at the site relative to that recorded pre-construction, due to the implementation of the 50-metre buffer described above, and to a level at which there is no longer potential for significant effects on bats (NatureScot, 2021).</p> <p>Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. At a minimum, monitoring will be conducted for 3 years post-construction.</p> <p>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. The performance of the 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 year, 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.</p>	As required	As required	Bat Ecologist