# 19. SCHEDULE OF MITIGATION MEASURES

## 19.1 INTRODUCTION

This chapter of the EIAR provides a summary of the findings of this EIAR, based on the design and mitigation measures identified within the technical assessments of this report. The schedule below details the measures upon which the findings of this EIAR have been based and are an integral part of the proposed project.

During the pre-construction, construction, operational and decommissioning phases of the project, all personnel working on the project will be required to be responsible for the environmental control of their own work and to perform their duties in accordance with the requirements and procedures of the Construction Environmental Management Plan (see Appendix 2-6).

## 19.2 SCHEDULE OF MITIGATION MEASURES

The following table provides a summary of the mitigation measures proposed within this EIAR. In addition, any monitoring proposals have been included.

**Table 19-1: Table of Mitigation Measures**

| Ref No. | Related to | Location | Mitigation Measure | Monitoring |
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| | | | **Pre-construction Phase** | |
| **Description of Proposed Project** | | | | |
| MM1 | Environmental Management – Construction Environmental Management Plan (CEMP) | EIAR Chapter 2 | A CEMP has been prepared for the proposed project and is included in Appendix 2-6 of the EIAR. The CEMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the planning authority for written approval.<br><br>The Contractor will be responsible for implementing the mitigation measures specified in the EIAR and CEMP and for communicating the requirements with all staff on-site. Their implementation of the mitigation measures will be overseen by the supervising environmental manager/clerk of works, ecologists, archaeologists and/or geotechnical engineers, as appropriate. | As required through the Contractor's CEMP. |
| MM3 | Health and Safety | EIAR Chapter 2 | A Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations. | As required through the Contractor's CEMP and the Health and Safety Plan. |
| MM4 | Surface Water Drainage System | EIAR Chapter 2 and Chapter 9 | Silt fences will be installed prior to the commence of works to protect any downgradient watercourses. | As required through the Contractor's CEMP and the Surface Water Management Plan (EIAR Appendix 2-8). |
| MM5 | Traffic Management | EIAR Chapter 2 and Chapter 16 | A Traffic Management Plan (TMP) has been prepared for the proposed project and is included as EIAR Appendix 16-1. This is a living document and will be updated ahead of construction to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by An Coimisiún Pleanála, in the event planning permission/approval is granted. | As required through the Contractor's CEMP and TMP. |

| Ref No. | Related to | Location | Mitigation Measure | Monitoring |
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| MM6 | Road condition | EIAR Chapter 16 | A confirmatory survey of the road condition, including the condition of all road water crossings along GCO One (if proceeding), will be carried out in advance of any works. | As required through the Contractor's CEMP and TMP. |
| **Biodiversity** | | | | |
| MM7 | Ecological Clerk of Works (ECoW) | Chapter 6 and Chapter 7 | An ECoW will be appointed to the project pre construction. The ECoW will be responsible for pre-construction surveying and monitoring compliance with the EIAR and Natura Impact Statement (NIS) mitigation measures and construction phase monitoring requirements relating to ecology/biodiversity. | As required through the Contractor's CEMP. |
| MM8 | Otter | EIAR Chapter 6 | Pre-construction confirmatory surveys prior to the commencement of any works will be carried out by a competent ecologist to identify any changes in otter activity or holt/couch locations within the proposed project.<br><br>Otter surveys will be undertaken no more than 10—12 months in advance of the construction works as per the advice in the NRA | As required through the Contractor's CEMP. |
| MM9 | Habitat Protection | EIAR Chapter 6 | Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (NRA, 2006) will be followed to ensure that any vegetation which is to be retained is given protection during the construction phase:<br>• All areas of hedgerows which are required to be retained as part of the proposed project will be demarcated to ensure that only habitat outside of these areas are subject to removal/fragmentation;<br>• If a tree is required to be felled, it will be assessed by an arborist/tree surgeon on how best to fell in order to avoid impact to the surrounding habitats and determine the proficient size of a root protection area (RPA). The RPA will be defined based upon the recommendation of a qualified arborist;<br>• The area within the RPA will not be used for vehicle/machinery parking or the storage of any materials (including soils, oils and chemicals). The storage of hazardous materials (e.g., hydrocarbons) or concrete washout areas will also not be undertaken within 5 m of any retained trees, hedgerows and treelines;<br>• A qualified arborist will assess the condition of, and advise on any repair works necessary to, any trees which are to be | As required through the Contractor's CEMP. |

| Ref No. | Related to | Location | Mitigation Measure | Monitoring |
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| | | | retained or that lie outside of the proposed project but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist; and<br>• A buffer zone of at least 5 m will be maintained between construction works and retained hedgerows to ensure that the RPA are not damaged. | |
| | | | Any drains (FW4 habitat) which are to be retained as part of the proposed project will be demarcated to ensure that only habitat outside of these areas are subject to removal. | As required through the Contractor's CEMP. |
| | | | All areas of wet grassland (GS4 habitat) at turbine T3 which are required to be retained as part of the proposed project will be demarcated to ensure that only habitat outside of these areas are subject to removal. This area is adjacent to wet heath habitat (HH3) and demarcation of the area will be done under guidance and supervision of the Ecological Clerk of Works (ECoW).<br>To ensure that no direct impact occurs within the footprint of the HH3 habitat, the entire area of wet heath adjacent to T3 will be fenced off to ensure no construction phase vehicles, machinery, personnel and/or works take place within this area of habitat, including personnel and machinery undertaking conifer felling as part of the bat buffer at T3. Demarcation of the area will be done so under guidance and supervision of the ECoW. In order to prevent additional surface water from entering this HH3 habitat, drainage at T3 will be directed to flow westerly away from this area. This will ensure no change to the habitat type as a result of surface water. | As required through the Contractor's CEMP. |
| MM10 | Common Frog | EIAR Chapter 6 | Common frog will be surveyed during the appropriate season (February to June) in advance of any works at drainage ditches where the common frog may spawn. If recorded, a method statement will be prepared to detail specific measures to translocate the frogs and spawn, by hand or net, to suitable nearby habitat that will not be impacted by the proposed project. The method statement will be used to inform the application to NPWS for a licence to capture and relocate spawn and frogs. | As required through the Contractor's CEMP. |
| **Ornithology** | | | | |
| MM11 | Bird protection | EIAR Chapter 7 | A Bird Protection Plan (BPP) will be produced prior to construction as set out in EIAR Chapter 7. | As required through the Contractor's CEMP and the BPP. |

| Ref No. | Related to | Location | Mitigation Measure | Monitoring |
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| **Material Assets** | | | | |
| MM12 | Underground Services | EIAR Chapter 11 | Prior to the commencement of the construction phase the applicant will engagement with all utility asset owners / service providers;<br>• A confirmatory survey of all existing services (electrical/ESB, water/Uisce Éireann, gas/Gas Networks Ireland (GNI), telecoms cables etc.) will be carried out prior to construction to verify the assumptions in this report and identify the precise locations of any services. Where assets / services are identified, the Applicant will liaise with the service provider;<br>• Utility assets / services (underground and overhead) will be identified and clearly marked prior to any pre-construction (site clearance) / construction / demolition activity occurring;<br>• No excavations will take place without prior consultation with relevant utility asset owners / service providers;<br>• Digging around existing services, if present, will be carried out as per best practice/guidance[1] by hand to minimise the potential for accidental damage;<br>• Prior to any mechanical excavation taking place ESBN will be consulted with and the exact locations of all underground electricity cables established and verified;<br>• All works undertaken in the vicinity of underground assets will be carried out in accordance with current HSA guidance, namely the HSA 'Code of Practice for Avoiding Danger from Underground Services';<br>• All works will be undertaken with in accordance with the exclusion and safe operating distances around electricity infrastructure as set out in the ESB Code of Practice, as well as HSA guidance including the 'Code of Practice for Avoiding Danger from Overhead Electricity Lines';<br>• Any proposed works will require a minimum clearance distance of 1 m either side of electrical cables; and<br>• Liaison with asset owners / service providers will continue as required throughout the construction phase. | As required through the Contractor's CEMP. |

[1] https://www.gasnetworks.ie/home/safety/dial-before-you-dig/
Transmission Policies and Standards (eirgridgroup.com)/ Publications (esbnetworks.ie)

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| **Archaeology** | | | | |
| MM13 | Archaeological Investigations | EIAR Chapter 15 | Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the greenfield locations of the proposed wind farm development and cable route. Additionally, the area required for accommodation works for the TDR within the ZoN of AH43 will be subject to archaeological testing, in advance of construction. These investigations will be carried out under licence to the National Monuments Service of the DoHLGH. Dependant on the results of the assessment and if archaeological remains are identified, further mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require agreement from the National Monuments Service of the DoHLGH. | As required through the Contractor's CEMP. |
| | | | Lime kiln (CH35) is located within the proposed hardstand for Turbine 10, and will be demolished during construction of the proposed project. The lime kiln will be subject to a detailed photographic and written record prior to the construction of the proposed project, carried out by a suitably qualified archaeologist. | |
| **Traffic and Transport** | | | | |
| MM14 | Traffic: Pre-Construction Condition Survey | EIAR Chapter 16 | The client will undertake pre-construction and post-construction visual pavement surveys on the Haul Roads. Where the surveys conclude that damage on the roadway is attributable to the Construction Phase of the proposed project, the applicant will fund the appropriate reinstatement works to bring the road back to pre-construction condition as a minimum, details for which will be agreed with the Roads Authorities. | As required through the Contractor's CEMP and TMP. |
| MM15 | Sightlines | EIAR Chapter 16 | Maintenance of the hedgerows within the visibility splays shall be undertaken to maintain the required visibility splays and mitigate the potential for overgrown vegetation which may result in inadequate visibility at the access and crossing points during the construction activities. | As required through the Contractor's CEMP and TMP. |
| **Construction Phase** | | | | |
| **Description of Proposed Project** | | | | |
| MM16 | Construction Hours | EIAR Chapter 2 | The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations will generally be restricted to between 07:00 hrs and 19:00 hrs Monday to Friday (excluding public holidays) and between 07:00 hrs and 14:00 hrs on Saturdays. | As required through the Contractor's CEMP. |

| Ref No. | Related to | Location | Mitigation Measure | Monitoring |
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| | | | However, during the following critical periods longer hours will be required:<br>• Concrete pours for turbine foundations;<br>• During turbine installation when the weather is suitable (i.e. light winds);<br>• Delivery of oversized loads; and<br>• In the unlikely event of an emergency (this is unlikely - see Chapter 17 (Major Accidents and Natural Disasters)).<br><br>Any such out of hours working will be agreed in advance with Kilkenny County Council apart from in the case of an emergency. | |
| MM17 | Surface Water Drainage / Silt Control | EIAR Chapter 2 | The surface water drainage system will have weekly and daily inspections depending on the construction phase works to ensure that it is working optimally. Settlement ponds will have regular inspection and cleaning where sediment collects. The drainage and treatment system for the proposed wind farm will be monitored more frequently during/after heavy rainfall events during the construction phase. A programme of inspection and maintenance will be designed and dedicated construction personnel assigned to manage the inspection programme. This is discussed further in the CEMP (Appendix 2-6) and SWMP (Appendix 2-8). | As required through the Contractor's CEMP and SWMP. |
| MM18 | Concrete Deliveries & Pouring | EIAR Chapter 2 | Primarily ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. Localised mixing will be used for small tasks such as blockwork for building the substation. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks from large scale on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place. 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. These residual liquids and solids will be collected by an appropriately licensed waste collector. Where temporary lined impermeable containment areas are used, such containment areas are excavated and lined with an impermeable membrane. This washout will be located near Site Entrance One and also at any significant concrete pour locations (e.g. at turbine | As required through the Contractor's CEMP. |

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| | | | hardstand during a foundation pour) so that it is easily accessed when departing.<br>Although unlikely to happen any disposal of surplus concrete after completion of a pour will be off-site at the concrete production facility. Localised mixing of concrete for blockwork, etc. will only be carried out as needed, but any small volume of surplus will be disposed of in the concrete washout area. | |
| MM19 | Refuelling | EIAR Chapter 2 | Any easily manoeuvrable road-going vehicles (i.e. cars, jeeps, lorries etc) will be refuelled off-site. For any vehicles which are slow moving or tracked or those for whom regular trips off-site to refuel will not be practical, on-site fuelling will be required. | As required through the Contractor's CEMP. |
| | | | A limited amount of fuel will need to be stored on the site within the construction compounds for this purpose, and this will be within a double skinned and bunded mobile tank which can be moved around the site using a 4x4 vehicle to refuel. This will be stored in the construction compound when not in use. | |
| | | | A spill kit in the form of a supply of fuel absorbent material and mats and a drip tray will be kept with the tank at all times. The drip tray and fuel absorbent mats will be used at all times during refuelling. Similar spill kits will be stored in each construction compound, and at the on-site substation in case of emergency. | |
| | | | No refuelling will be carried out within 50 m of a stream. Only designated trained and competent operatives will be authorised to refuel plant on site. | |
| | | | In the event of an accidental fuel spill, the source of the spill will be fixed, fuel will be contained and cleaned as quickly as possible using the fuel absorbent material in the spill kits. The incident will be reported to the site manager and Environmental Manager, and appropriate remediation will be carried out (i.e. soil removal for safe disposal at a licensed waste facility by licensed waste collectors. | |
| MM20 | Waste Management | EIAR Chapter 2 | Waste disposal will be avoided where possible. The Waste Management Plan and waste management practices associated with the proposed project are provided in the CEMP and will be in accordance with relevant provisions of the Waste Framework Directive (Directive 2008/98/EC on waste), the Waste Management Act 1996 as well as all other Irish and EU legislation.<br>The main site contractor will appoint an Environmental Clerk of Works who will ensure that all waste contractors have the correct permits for any waste streams they are removing from site, and that they are | As required through the Contractor's CEMP. |

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| | | | taking it to the appropriately licensed/permitted waste facilities. This includes any waste produced along GSO One (if constructed) from works occurring in the existing public road. They will also ensure that all parts of the Waste Management Plan will be implemented. | |
| MM21 | Spoil Management | EIAR Chapter 2 | The use of the borrow pits will be phased. This will allow materials to be permanently placed in the first borrow pit while the second is in use, thereby minimizing the volume of soils requiring temporary storage. In order to further reduce temporary storage requirements, soils and turves will be reinstated around infrastructure as part of restoration and landscaping works. This will be carried out during the construction phase, as soon as is practical after the completion of the works in any one area of the site. | As required through the Contractor's CEMP. |
| | | | Where the proposed project footprint is located on any mineral-based soil, this material will be side-cast and profiled as close to the excavation areas as practical. In the case where other adjacent infrastructure or constraint features might prevent side-casting, it will be used to reinstate the borrow pits. The sides of the excavated areas will be battered/sloped sufficiently to ensure that slippage does not occur (2:1 for mineral soil). The excavated side cast material will be smoothed with the back of an excavator bucket and surrounded by silt fences to minimise the potential for sediment-laden run-off occurrence. Side-casting will not occur within 50 m of a watercourse. The side-cast material will be used later in backfilling the working area around the turbine foundations, or for landscaping locally or reinstatement elsewhere on site (such as the borrow pits). Further information on the spoil management is provided in Appendix 2-4. | |
| | | | Where side-casting is not possible, topsoil and sub-soil should be stockpiled separately. Turves will be stored turf side up and will not be allowed to dry out. Stockpiles are to be isolated from any surface drains and a minimum of 50 m away from watercourses, and will be located at points with easy access to internal roads within the proposed borrow pit areas which have not yet been extracted. Measures that will be employed will include interceptor ditches around these areas, deployment of double silt curtains and seeding of the piles will be incorporated to prevent runoff of suspended solids and soil erosion. No permanent spoil or stockpiles will be left on site. | |
| | | | Where available, vegetative sods/turves or other topsoil in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface. Where sods/turves are not available, some | |

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| | | | seeding with native species will be carried out. This method for restoration of excavated or disturbed areas is to encourage stabilisation and early establishment of vegetation cover. | |
| | | | To prevent erosion and run-off and to facilitate vegetation reinstatement, any sloped soil embankment will be graded such that the slope angle is not too steep (i.e. 1:3) and that embankments match the surrounding ground profile. | |
| MM22 | Health and Safety | EIAR Chapter 2 and Chapter 5 | A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared prior to the construction stage. | As required through the Contractor's CEMP. |
| | | | The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations. | |
| **Population and Human Health** | | | | |
| MM23 | Health & Safety | EIAR Chapter 5 | All activities carried out by the appointed Contractor during the construction phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.<br>A Health and Safety Plan covering all aspects of the construction process will detail Health and Safety requirements. At the procurement stage, the Health and Safety Plan will be prepared on a preliminary basis and developed further at construction stage, with all hazards and risks identified and assessed. | As required through the Contractor's CEMP. |
| MM24 | Turbine Delivery Route (TDR) | EIAR Chapter 5 | The TDR works will be carried out to the relevant construction and road safety guidelines, and will allow for the proposed turbine dimensions. Turbine components will be being transported at night when there is less traffic on the road, and will be accompanied by Garda escort. | As required through the Contractor's CEMP. |
| **Biodiversity** | | | | |
| MM25 | Forestry Felling | EIAR Chapter 6 and Chapter 7 | With the exception of commercial forestry felling, hedgerow and tree vegetation clearance will commence outside the breeding birds season, which runs from the 1st of March to the 31st of August to protect any active bird nests and chicks. If any minor clearance or trimming is required within those dates, or if the initial vegetation clearance extends past the 1st of March due to unsuitable weather conditions, the works will be preceded by a confirmatory ecological survey (carried out by a qualified and suitably experienced ecologist) to ensure there are no active bird nests within the vegetation involved. | As required through the Contractor's CEMP. |

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| | | | If active bird nests are identified, works will stop and consultation will be undertaken with the National Parks and Wildlife Service (NPWS). | |
| MM26 | Water Quality Protection | EIAR Chapter 6 and Chapter 9 | The Inland Fisheries Ireland (IFI) 2016 guidelines 'Guidelines on Protection of Fisheries During Construction Works and in Adjacent to Waters' will also be adhered to. For example, at the bridge crossing locations, the foundations of the clear span bridges will be positioned at least 2.5 m from a watercourse.<br>All temporary crossings of watercourses will ensure the passage of water, fish and macroinvertebrates and will ensure erosion and sedimentation do not occur.<br>Any discharged water during the construction phase will be in the rage of pH 6-9 and will not alter the pH of receiving waters by+/- 0.5 units. Furthermore, suspended solids in any discharged waters will not exceed 25 mg/l. | As required through the Contractor's CEMP. |
| MM27 | Horizontal Directional Drilling (HDD) | EIAR Chapter 6 and Chapter 9 | HDD will be used to cross watercourses by grid connection cables. This will avoid the need for instream works. The following mitigations are included to protect watercourses during HDD:<br>• A competent and experienced Contractor will be appointed to undertake the horizontal directional drilling works;<br>• The Contractor will prepare a directional drilling Method Statement which will outline the standard approach for the construction. The Method Statement will include a contingency plan for frac-out and for excessive ground settlement;<br>• The Contractor will undertake the directional drilling in accordance with industry best practice including British Standard EN 16191:2014 Tunnelling machinery, safety requirements and CIRIA C648 'Control of water pollution from linear construction projects Technical Guidance' (CIRIA, 2006);<br>• The Contractor will ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, with the Contractor required to prepare a contingency plan for before and after such events;<br>• Weather conditions will be considered when planning construction activities to minimise the risk of runoff from site; | As required through the Contractor's CEMP. |

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| | | | • There will be no storage of fuels within 30 m of the watercourse;<br>• Provision of exclusion zones and barriers (silt fences) between any excavated material and any surface water features will be installed to prevent sediment washing into the receiving water environment. Silt fences will be installed and the contractor will ensure that silt fences are regularly inspected and maintained during the construction phase;<br>• If dewatering is required as part of the works (e.g., in trenches for underground cabling or in wet areas), water must be treated prior to discharge;<br>• To prevent loss of bentonite or 'frac-out' from occurring, a series of actions will be implemented; the drill fluids operator will monitor drill fluid density, viscosity and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility;<br>• In critical cases, viscometers will be used to measure drill fluid gel strength and shear strength. Filtrate can also be measured to calculate the amount of filter cake building up on the internal wall of the bore. Any increases in pump pressure experienced by the drill operator will be investigated immediately to prevent the risk of pressure build up within the annulus. In some circumstances, dependant on the drilling equipment used, the pilot drill borehole assembly will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall. This will give an early indication of pressure build up in the hole and allow the drill operator to prevent a 'frac-out'. If there is a risk of a 'frac-out' a number of measures will be implemented including:<br>○ Pumping a pill of drilling fluid with a higher density to the risk zone; and<br>○ Circulate and pump loss circulation material (typically cork or manufactured inert polymers) to the risk zone to seal the risk zone, grouting of the risk zone, and, or launch a packer before the risk zone. | |

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| | | | • The Contractor will implement procedures to maximise the recirculation or reuse of drilling fluid to minimise waste disposal;<br>• Disposal of drilling fluids will be the responsibility of the Contractor to an approved and licenced waste facility;<br>• Monitoring of the drilling operations will be undertaken at all times by the Contractor. The monitoring will include visual inspection of the pits and monitoring of the volume of returns flowing back to the entry pit. The monitoring personnel will be in constant communication with the drilling rig operator and thus will be able to immediately cease drilling if necessary; and<br>• Buffer strips of natural uncleared vegetation shall be preserved between construction activity. Reception pits will be situated outside of the riparian zone. A buffer zone width for smaller channels (<10 m) of 20 m or greater will be maintained. | |
| MM28 | Broadleaved woodland (WD1 habitat) | EIAR Chapter 6 | The removal of broad leaved woodland for the project will be mitigated by the planting of native broad leave woodland at the onsite compound sites. | As required through the Contractor's CEMP. |
| MM29 | Otter | EIAR Chapter 6 | Twilight working hours (i.e., time between dawn and sunrise and dusk and sunset), especially at the clear span bridge locations, will be restricted as far as possible. Otter are crepuscular species and as such disturbance will be reduced by restricting the amount of twilight working hours. | As required through the Contractor's CEMP. |
| MM30 | Bats | EIAR Chapter 6 | A 100 m buffer zone which is established from each turbine during the construction phase will be maintained throughout the operational phase of the proposed project. | As required through the Contractor's CEMP. |
| **Ornithology** | | | | |
| MM31 | Bird Protection | EIAR Chapter 7 | The Bird Protection Plan (BPP) will be followed (see pre-construction mitigation and EIAR Chapter 7). | As required by the Contractor's CEMP and BPP. |
| **Land, Soils and Geology** | | | | |
| MM32 | Land Use | EIAR Chapter 8 | Vegetation clearance will be kept to a minimum.<br>Construction vehicles will be restricted to designated areas and access roads in order to avoid effecting adjacent habitats and to ensure that soil compaction is restricted to these areas. | As required by the Contractor's CEMP. |

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| | | | All disturbed ground outside of the permanent footprint will be fully reinstated following the completion of the works. | |
| | | | Biodiversity enhancement measures will be undertaken to improve ecological habitats as detailed in EIAR Chapter 6 Biodiversity. | |
| MM33 | Soil protection | EIAR Chapter 8 | CEMP (Appendix 2-6) and Spoil Management Plan (Appendix 2-4) will be fully implemented to ensure proper handling, storage, and reuse of soils. | As required by the Contractor's CEMP. |
| | | | Hazardous substances (fuel, oils, chemicals) will be stored in bunded areas (110% capacity) with impermeable bases. | |
| | | | Spill response protocols include secondary containment, drip trays, supervised refuelling, and impermeable refuelling zones will be implemented. | |
| | | | Topsoil & subsoil will be stored separately (max. 3 m height), protected from contamination, and handled in dry conditions. | |
| MM34 | Potential for contamination - Concrete/cement management | EIAR Chapter 8 | Contractors will be required to provide a designated bin for washing down the chutes of concrete lorries on site. | As required by the Contractor's CEMP. |
| | | | Wash down and washout of concrete transporting vehicles will not take place on site. It is proposed to washout at the (offsite) source concrete batching site to prevent cementitious material and water entering the surface water network. | |
| | | | Waste material will be removed from site to an appropriate waste permit facility. | |
| | | | Disposal of excess concrete on any part of the construction site will be prohibited. | |
| MM35 | Soil Compaction and Erosion | EIAR Chapter 8 | Landscaping areas will be sealed and levelled using the back of an excavator bucket to minimise the potential for erosion. The upper vegetative layer 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 to prevent erosion. | As required by the Contractor's CEMP. |
| | | | The borrow pit deposition area surfaces will be stabilised by the establishment of natural vegetation. | |
| | | | Where mineral soil is not directly suitable for construction it will be used for reinstatement works and will be geo-engineered as necessary. | |
| | | | The construction traffic will utilise the permanent access road network for access and egress, and this access will be constructed in advance of other ground works in a sequential manner. | |

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| | | | Soils, overburden, and rock will be reused on site to reinstate any excavations where appropriate. | |
| | | | Access tracks will be constructed first to allow for access within the proposed project. Vehicular movements will be restricted to the footprint of the proposed project, particularly with respect to the newly constructed access tracks. This means that machinery must be kept to the tracks and aside from advancing excavations do not move onto areas that are not permitted for the development, such as areas which have not been designated for access or infrastructure. | |
| | | | Construction of internal electricity transmission cables will present similar, but lower-level risks, to the construction risks outlined above, and the same mitigation measures will be adopted as above. Surplus material from the onsite roads will be reused on site in the borrow pits or on road upgrades. | |
| MM36 | Proposed grid connection and works areas of the proposed TDR | EIAR Chapter 8 | The majority of the proposed GCO One cabling will be laid in the public road. Construction method statements and templates will be implemented to ensure that the proposed GCO infrastructure is installed in accordance with the correct requirements, materials, and specifications of ESBN and EirGrid. The ducts will be installed and the trenches will be reinstated in accordance with ESBN/EirGrid, private third-party landowners and County Council specifications. | As required by the Contractor's CEMP. |
| | | | For concrete and asphalt/bitmac road sections, it is proposed to carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with the local authority. Surplus excavated bitmac material will be brought to a recycling facility for processing in accordance with the circular economy approach. | |
| | | | For offroad i.e. access tracks/grass sections, the cable section will be laid within an existing access track. Silt fences will be utilised along the offroad sections. Short sections (<50m) will be excavated and reinstated on a phased basis with suitable excavated material to ground level and finish in a gravel track as per the EirGrid/ESBN specification. By limiting the excavated sections, the potential for compact or erosion is limited. | |
| **Hydrology and Hydrogeology** | | | | |
| MM37 | Surface Water Quality | EIAR Chapter 9 | The SWMP will be implemented by the appointed contractor and will be regularly audited throughout the construction phase. The Environmental Manager will be required to stop works on site if he/she | As required by the Contractor's CEMP. |

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| | | | is of the opinion that a mitigation measure or corrective action is not being appropriately or effectively implemented. | |
| | | | Local surface water features at the proposed wind farm site boundary will be monitored pre-construction and during construction to take account of any variations in the quality of the local surface water environment as a result of activities related to the proposed wind farm site.<br><br>Inspections of silt traps are critical after prolonged or intense rainfall while maintenance will ensure maximum effectiveness of the proposed measures.<br>Stockpiles will be evaluated and monitored and kept stable for safety and to minimise erosion.<br>Turbidity monitors/alarms will be strategically placed upgradient and downgradient of the works to assess the effects, if any, of the main construction works including bridge crossings and turbine base construction. Elevated turbidity could result from a number of on-site construction activities or from off-site sources i.e. erosion, forestry or agricultural activities.<br>Where elevated turbidity is noted both upstream and downstream, visual checks will be undertaken. All monitoring equipment will be calibrated regularly to ensure that results are accurately measured.<br><br>Corrective Actions would include:<br>• Investigate whether channels used to convey water are protected with vegetation, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures.<br>• Check all outlets and locations of turbidity monitors<br>• Stop dewatering if the downgradient area shows elevated turbidity or erosion.<br>• Check outlet protection or a velocity dissipation device.<br>• Ensure a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlay) in place at outlets.<br>• Check for leaking pumps, hoses, and pipe connections and fix same if identified. | |

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| | | | A programme of inspection and maintenance will be designed, and dedicated construction personnel assigned to manage this programme.<br>A checklist of the inspection and maintenance control measures will be developed, and records kept.<br>During the construction phase, field testing, sampling and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event-based as appropriate).<br>Monitoring and maintenance as required throughout the construction stage. | |
| | | | All near-stream construction activities will be conducted in compliance with Inland Fisheries Ireland's (IFI) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites" (2016). | |
| | | | For each stream crossing, two lines of silt fence will be erected to provide a physical separation, which will trap suspended sediment from the works area. Silt fences will be inspected routinely, and inspections will be increased after runoff events. A clear span bridge will be utilised on the smaller Smithstown_15 stream and Smartscastle stream. Commercial forestry drains will be crossed using standard culverts. | |
| MM38 | Forestry: Felling | EIAR Chapter 9 | The Standards for Felling and Reforestation describe the universal standards that apply to all felling (thinning, clear felling) and reforestation projects on all sites. The standards will be implemented under a felling licence issued by the Department of Agriculture, Food & the Marine. | |
| | | | In accordance with the Forestry and Water Quality Guidelines (Forestry Service, 2000), buffer zones will be identified and marked out on the ground. These guidelines deal with sensitive areas, erosion, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. Construction activities will be curtailed within the buffer zones in order to reduce erosion and sedimentation and, therefore, to protect surface water quality. Buffer zone widths vary from 10 m to 25 m, depending on slope and soil erosion classification. | |
| | | | The slopes across the proposed wind farm site are predominantly moderate (<1:10) with steeper slopes to the southeast and northeast. As the soil type varies across the proposed wind farm site, in line with | |

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| | | | the Forestry Service Guidelines (2000) a 10 m to 20m buffer zone is appropriate. | |
| | | | All associated tree felling will be undertaken using good working practices as outlined in the Forestry Report and the CEMP (Appendices 2-3 and 2-6 of this EIAR), the Forestry Harvesting and Environment Guidelines (Forestry Service, 2000) and the Forestry and Water Quality Guidelines (Forestry Service, 2000). Brash mats will be used to support harvesting and forwarding machinery. The brash mats reduce erosion of the surface and will be renewed as they become used and worn over time. | |
| MM39 | Forestry: Silt fencing / sediment traps | EIAR Chapter 9 | During any near stream construction work, silt traps and double row silt fences will be placed immediately down-gradient of the construction area for the duration of the construction phase. | |
| | | | Sediment traps will require monitoring and maintenance throughout the construction stage. Sediment traps will be constructed and maintained in line with the requirements of the Forest Road Manual and Forest Drainage Engineering – A Design Manual (Forestry Schemes Manual, 2011). | |
| MM40 | Forestry: Drainage | EIAR Chapter 9 | With reference to the COFORD 2002 guidance , the following measures will be implemented in relation to the existing forest drainage:<br>• Minimise the crossing of drains during felling and extraction and restrict machine activity to brashed extraction racks and forwarding routes;<br>• Where a drain crossing is needed, based on the size of the forest drain one of the following methods will be selected that prevents the breakdown and erosion of drain sides, namely:<br>  ○ For larger drains, deploy a heavy-duty plastic culvert lengthways into the channel and cover with brash material. The culvert must be of a diameter approximating the depth of the drain, to avoid any unnecessary undulation along the extraction route.<br>  ○ Where required, a solution for smaller drains is to temporarily lay log sections lengthways into the channel and overlay with brash. Again, logs will be that approximate to the depth of the channel to be crossed. | |
| MM41 | Watercourse crossings | EIAR Chapter 9 | Minimise the crossing of streams during felling and extraction by choosing alternative routes which avoid the watercourses/aquatic zones. | |

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| | | | Direct crossing over the stream bed will not be permitted.<br>Water features will be crossed at a right angle to the flow of water.<br>Any necessary crossing will be via an appropriate structure that spans proud of the flow of water and prevents the breakdown and erosion of the banks. | |
| MM42 | Concrete Management | EIAR Chapter 9 | Concrete is required for the construction of the turbine bases and foundations. Wash out of the main concrete mixing drum will not be permitted on site; wash out is restricted only to chute wash out. Wash down and washout of the concrete transporting vehicles will take place at an appropriate facility off-site.<br>Cement and raw concrete will not be spilled into watercourses.<br>Ready-mixed supply of wet concrete products and emplacement of pre-cast elements such as culverts and the clear span bridges across watercourses will take place. During the delivery of concrete on site, only the chute will be cleaned on-site.<br>Chute cleaning will be undertaken at lined cement washout lagoons. The collected concrete washout water and solids will be emptied on a regular basis. Washout will be undertaken at the construction compounds. These lagoons will be cleaned out by a licensed waste contractor. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Weather forecasting will be used to plan dry days for pouring concrete. The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event. | As required by the Contractor's CEMP. |
| MM43 | Fuels & Chemicals | EIAR Chapter 9 | With regards to on-site storage and handling of potentially pollutant materials:<br>• All on-site refuelling will be carried out by a trained competent operative.<br>• Mobile measures such as drip trays and fuel absorbent mats will be kept with all plant and bowsers and will be used as required during all refuelling operations;<br>• A spill kit will be stored with the bowser and the person operating the bowser will be trained in its use;<br>• All equipment and machinery will have regular checking for leakages and quality of performance and will carry spill kits;<br>• Any servicing of vehicles will be confined to designated and suitably protected areas such as construction compounds; and | As required by the Contractor's CEMP. |

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| | | | • Additional drip trays and spill kits will be kept available on site, to ensure that any spills from vehicles are contained and removed off site. | |
| MM44 | Drainage Management | EIAR Chapter 9 | Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. | As required by the Contractor's CEMP. |
| | | | Track edge drainage/swales will be implemented to control run-off from the running surface to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points. Swales along access tracks will be installed in advance of the main construction phase. | |
| | | | Swales will provide additional storage of storm water, located along gradient. Given the steep longitudinal gradients on some sections of access track, regular check dams will be employed within the trackside swale on these sections to reduce the flow velocity and provide settlement opportunity.<br>Swales will re-vegetated following excavation. Vegetation will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention. | |
| | | | Settlement ponds will be located downstream of road swale sections and at hardstand locations, to manage/buffer volumes of runoff discharging from the drainage system during periods of high rainfall, thereby reducing the hydraulic loading to watercourses. Settlement ponds are designed in consideration of the greenfield runoff rates.<br>The settlement pond design is based on primary settling out of suspended solids from aqueous suspension. Settlement ponds will be installed alongside with the formation of the road and will be fenced off for safety.<br>Only the proposed onsite access roads will be used for project-related traffic. | |
| MM45 | Borrow Pit reinstatement areas/ deposition areas | EIAR Chapter 9 | Excavated material will be reused on site. The stockpiling of materials will be carefully supervised. Surplus material will be placed in the borrow areas. | As required by the Contractor's CEMP. |
| | | | The nature of the spoil deposition areas is an important measure in mitigating against suspended solids in run-off. The spoil deposition areas are all >50 m from rivers and relatively flat. This mitigates against potential stability issues. | |

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| MM46 | Stream crossings / Proposed GCR and works areas on the proposed TDR | EIAR Chapter 9 | For the stream crossings, two lines of silt fence will be erected to provide a physical separation, which will trap suspended sediment from the works area. Silt fences will be inspected routinely and inspections will be increased after runoff events. Clear span bridges will be used to cross streams/rivers on site. Commercial forestry drains will be crossed using standard culverts. | As required by the Contractor's CEMP. |
| | | | Silt fencing will be erected at the location of stream crossings along the proposed GCOs.<br>Appropriate steps will be taken to prevent soil/dirt generated during the accommodation works to the proposed TDR from being transported on the public road. | |
| | | | Appropriate steps will be taken to prevent soil/dirt generated during the accommodation works to the proposed TDR from being transported on the public road. Road sweeping vehicles will be used as required, to ensure that the public road network remains free of soil/dirt from the location of the proposed TDR works areas when required. This will reduce the potential for sedimentation of surface watercourses locally. | |
| MM47 | Groundwater Quality | EIAR Chapter 9 | During the construction phase, all works associated with the construction of the wind farm site will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Groundwater pumped from excavations will be treated to remove silt by the use of silt bags. Water will discharge from the silt bags into settlement ponds and the SuDS network. | As required by the Contractor's CEMP. |
| | | | Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).<br>All personnel working on the proposed project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP. | |
| | | | The dewatering operations will be inspected once each day when dewatering is taking place to ensure that dewatering treatment controls are working correctly and to evaluate whether there are observable indicators of sediment discharges. Where any issues are encountered, action will be undertaken to correct any problems at the proposed project or with the dewatering controls that may have contributed to the discharges. | |

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| | | | Regular monitoring of groundwater (levels and quality) will take place using existing monitoring boreholes during the construction phase. The existing groundwater well on site will be monitored on site during construction and for a period following cessation of construction activities (to be agreed with the relevant authorities). | |
| **Material Assets** | | | | |
| MM48 | Telecommunications | EIAR Chapter 11 | In the unlikely event that a communication underground cable or link is damaged or interfered with during construction, the operator will be contacted to agree a repair which will be carried out as soon as possible at the developers cost.<br>In addition, the developer has signed an agreement with 2RN prior to commit to restoring service to any end users that may have their service disrupted as a result of the proposed project. This is standard industry practice and will eliminate any potential effects in this regard. | As agreed with 2RN. |
| MM49 | Aviation | EIAR Chapter 11 | The following standard practices will be undertaken:<br>• An aeronautical warning light scheme will be agreed with the IAA and Irish Air Corps;<br>• The final as-constructed coordinates and dimensions of each turbine be mapped and provided to Kilkenny County Council and other stakeholders, including the IAA, Irish Air Corps, and Waterford Airport, prior to erection of turbines to ensure that maps and databases are up-to-date for flight navigation;<br>• 30 days' notice will be given to the IAA prior to any crane operations commencing during the construction phase. | As required by the Contractor's CEMP. |
| MM50 | Waste Management (including wastewater) | EIAR Chapter 11 | Segregation of waste will be carried out to maximise the potential for waste recycling and minimise potential effect on waste services. Suitably permitted commercial waste collectors will be employed to remove any waste arisings generated from construction to the nearest appropriately licensed waste management facilities. | As required by the Contractor's CEMP. |
| | | | Wastewater from the staff welfare facilities will be managed by means of a sealed storage tank, with all wastewater being tankered off-site occasionally (as required) by a permitted waste collector to a wastewater treatment plant. The permitted waste collector will also be responsible for ensuring clean water storage tanks are topped up. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. It is proposed to use low volume flush toilets (such as those in commonly used port-a loos) and low volume sink faucets to significantly reduce the volume of waste water produced. | As required by the Contractor's CEMP. |

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| **Noise & Vibration** | | | | |
| MM51 | Noise and Vibration | EIAR Chapter 12 | A schedule of noise control measures has been formulated in accordance with best practice guidance, and the contract documents will require the Contractor to implement these measures. These are outlined in the Construction and Environmental Management Plan (CEMP) that has been prepared for the proposed project. | As required by the Contractor's CEMP. |
| **Air Quality and Climate** | | | | |
| MM52 | Dust Management / Air Quality – Communications | EIAR Chapter 14 | An Environmental Manager (EM)/Clerk of Works will be in assigned by the appointed contractor. The EM will be responsible for co-ordinating the day-to-day management of environmental impacts during the construction phase. The EM will be responsible for performing inspections as deemed necessary and manage responses to environmental incidents. The name and contact details of the EM will be responsible for construction dust management and air quality issues will be displayed at the construction compound/site boundary hoarding, as well as head/regional office contact details.<br>A complaints register will be kept by the appointed contractor detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out. | As required by the Contractor's CEMP. |
| MM53 | Dust Management / Air Quality – Construction area works management | EIAR Chapter 14 | Construction compounds will be laid out so that machinery and dust causing activities such as stockpiles are located away from receptors, as far as is practicable.<br>The appointed contractor will provide a site hoarding of 2.4 m height along noise sensitive boundaries, at a minimum, at the Construction Compounds, which will assist in minimising the potential for dust impacts off-site. Construction works area fencing, barriers and scaffolding will be kept clean using wet methods.<br>Stockpiles will be covered to prevent wind whipping.<br>Any chutes and conveyors will be enclosed and skips will be covered.<br>Drop heights from any conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised. Fine water sprays will be used on such equipment where visible dust plumes are generated.<br>Cutting, grinding or sawing equipment will be fitted with or used in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. | As required by the Contractor's CEMP. |

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| | | | Equipment will be readily available in the construction works areas site to clean any dry spillages. Spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods.<br>An adequate water supply for effective dust or particulate matter suppression and mitigation will be ensured, and non-potable water will be used where possible and appropriate.<br>Construction works area runoff of water or mud will be managed as per the project SWMP and CEMP). | |
| MM54 | Dust Management / Air Quality – Operating Vehicles / Machinery | EIAR Chapter 14 | Engines of all vehicles will be switched off engines when stationary - idling vehicles are not permitted.<br>The use of diesel- or petrol-powered generators will be avoided and mains electricity or battery powered equipment will be used where practicable.<br>The Traffic Management Plan will be adhered to be the appointed contractor. | As required by the Contractor's CEMP. |
| MM55 | Dust Management / Air Quality – Earthworks Activities | EIAR Chapter 14 | Materials with the potential to produce dust, such as excavated material, will be removed from the construction works area as soon as possible, unless being re-used within the construction works area. Management of extracted material is detailed in the CEMP, EIAR Appendix 2-6.<br>Areas exposed by earthworks will be re-vegetated to stabilise surfaces as soon as practicable. Hessian, mulches or trackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Cover will only be removed in small areas during work and not all at once.<br>During dry and windy periods and when there is a likelihood of dust nuisance (defined under "Monitoring" measures below), water-based dust suppression (e.g. bowser) will operate to ensure soil moisture content is high enough to increase the stability of the soil and thus suppress dust. | As required by the Contractor's CEMP. |
| MM56 | Dust Management / Air Quality – Construction Activities | EIAR Chapter 14 | Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process.<br>Smaller supplies of fine power materials bags will be sealed after use and stored appropriately to prevent dust escaping. | As required by the Contractor's CEMP. |

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| MM57 | Dust Management / Air Quality – Measures specific to trackout | EIAR Chapter 14 | A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.<br>Vehicles transporting loose materials (e.g. spoil or sand) entering and leaving the works areas and construction compounds will be covered with tarpaulin to prevent escape of materials during transport. Before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place.<br>Where construction work area or construction compound conditions result in large amounts of mud building up on truck wheels, wheel washing will be carried out for trucks before they use the public road network.<br>Water-assisted dust sweeper(s) will be used at the access points to a construction compound and the immediate adjoining local road, to remove, as necessary, any material tracked out of the compound.<br>Any on-site haul routes will be inspected for integrity and necessary repairs to the surface will be carried out as soon as reasonably practicable. | As required by the Contractor's CEMP. |
| MM58 | Embodied carbon | EIAR Chapter 14 | Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Best practice measures to reduce the embodied carbon of the construction works will be implemented:<br>• Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;<br>• The use in construction plant and equipment of sustainably sourced Hydrotreated Vegetable Oil (HVO) as a 100% replacement of fossil fuels. HVO use is considered a stepping stone towards the use of electric construction plant as they become available in the market;<br>• The replacement, where feasible, of standard concrete containing Portland cement concrete with an alternative concrete mix with lower associated embodied carbon, as per the Climate Action Plan. This will be a minimum of 30% GGBS replacement, or concrete with equivalent or lower associated embodied carbon;<br>• Procurement contracts will ensure that material choices with lower associated embodied carbon relative to standard construction materials are considered favourable during tender; | As required by the Contractor's CEMP. |

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| | | | • Materials will be reused on site where possible;<br>• Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;<br>• Ensure all plant and machinery are well maintained and inspected regularly;<br>• Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;<br>• Where practicable, opportunities for materials reuse will be incorporated within the extent of the proposed project including the use of reclaimed asphalt and recycled aggregate, which will reduce the virgin material needs; and<br>• Sourcing materials locally where possible, such as local quarries for aggregates required on site to reduce transport related CO2 emissions. | |
| MM59 | Climate Change | EIAR Chapter 14 | In terms of impact on the proposed project due to climate change, during construction the Contractor will mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements.<br>The Contractor will mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements.<br>All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures and the Contractor will ensure that these are complied with. Temperatures can affect the performance of some materials, and this will require consideration during construction.<br>During construction, the Contractor will mitigate against the effects of fog, lighting and hail through site risk assessments and method statements. | As required by the Contractor's CEMP. |
| **Archaeology and Cultural Heritage** | | | | |
| MM60 | Topsoil / Excavations | EIAR Chapter 15 | A suitably qualified archaeologist will be appointed to monitor all stripping of topsoil across the proposed project.<br>All stripping of topsoil across the proposed project, including excavations as part of the proposed GCO One within the ZoN of AH02 (church, graveyard, mill, redundant record), the c. 2.5 km section of greenfield included in GCO One, accommodation works along the | As required by the Contractor's CEMP. |

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| | | | proposed TDR and townland boundary crossings will be monitored by a suitably qualified archaeologist.<br>Should any features of archaeological potential be discovered during the course of the works further mitigation will be implemented as required and agreed with the National Monuments Service. | |
| **Traffic and Transportation** | | | | |
| MM61 | Traffic Management Plan (TMP) | EIAR Chapter 16 | The Traffic Management Plan (TMP) is a comprehensive set of mitigation measures that will be put in place by the Contractor before and during the construction phase of the project to minimise its effects. The TMP proposed for the Ballyfasy Wind Farm is included in Appendix 16-1.<br>The following mitigation has been incorporated into the TMP:<br>• Traffic movements will be limited to 07:00 – 19:00 Monday to Friday and 07:00 – 14:00 Saturday, unless otherwise agreed in writing with Kilkenny County Council.<br>• HGV movements will be restricted during peak road network hours (including school hours) from 08:00 – 09:00 and 17:00 – 17:00 Monday to Friday, unless otherwise agreed in writing with Kilkenny County Council.<br>• Clear construction warning signs will be placed on the public road network to provide adequate warning to road users of the presence of the construction site and slower-moving vehicles making turning manoeuvres.<br>• Haul route selection to avoid sensitive receptors.<br>• The existing and widened internal access roads facilitate queuing of construction vehicles off the public road.<br>• Traffic Management Operatives (TMOs) will be provided by the principal contractor in accordance with the Traffic Management Plan at the site access during peak construction traffic activities.<br>• Wheel washes will be provided on site as per the site layout drawings (see Appendix 1-1) to prevent the build-up of mud on public roads. | As required through the TMP. |
| | | | Only essential deliveries will be scheduled to occur on the same days as the concrete pours. | As required by the Contractor's CEMP. |
| | | | Maintenance of the hedgerows within the visibility splays shall be undertaken to maintain the required visibility splays and mitigate the potential for overgrown vegetation which may result in inadequate | As required by the Contractor's CEMP. |

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| | | | visibility at the access and crossing points during the construction activities. | |
| | | | Mitigation measures on the haul roads and cable route includes:<br>• Selection of a viable route with the lowest impact on the road network.<br>• Avoidance of sensitive receptors and urban settings<br>  ○ The site access route encourages the use of the existing infrastructure in the area while avoiding the local road and potential sensitive receptors.<br>  ○ Turbine delivery route along national roads with largest capacity to accommodate the vehicles.<br>  ○ The typical construction materials are obtained from borrow pits onsite and from local quarries in the proximity of site.<br>  ○ Restricting HV movements during peak sensitive times on the road networks (i.e., at school times).<br>  ○ The grid connection route will be carried out at off-peak times.<br>• To mitigate the impact of the AIL delivery on the road network, the advanced works will be undertaken (i.e., hardstanding, making signs demountable, utility diversions etc). | As required by the Contractor's CEMP. |
| MM62 | Traffic – GCO One/ road closures/ reinstatement | EIAR Chapter 16 | Should GCO One be constructed, the appointed Contractor shall consult and comply with the Roads Authority, An Garda Síochána and other Emergency services to agree a suitable diversion route prior to implementing a road closure.<br>To mitigate the impact of the cable laid within the public road, the reinstatement works will be backfilled and reinstated as soon as practicable. The reinstatement works will be undertaken in accordance with the "Purple Book" best guidance and practices. The proposed reinstatement and construction details and phasing will be agreed with associated Local Authorities in advance of the works. The Contractor will be responsible for arranging for the required road opening licences. | As required by the Contractor's CEMP. |
| **Operational Phase** | | | | |
| **Description of Proposed Project** | | | | |
| MM63 | Operational Health and Safety | EIAR Chapter 2 | Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. | As required through the project Operational Management Plan / Health and Safety Plan. |

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| | | | Signs will be erected at suitable locations across the site as required for the ease and safety of operation of the wind farm. Further details are provided in the CEMP (Appendix 2-6 of the EIAR). | As required through the project Operational Management Plan / Health and Safety Plan. |
| | | | The components of a wind turbine are anticipated to have a useful lifespan of 35 years or more and are equipped with a number of safety devices to ensure safe operation during their lifetime. During the operation of the wind farm regular maintenance of the turbines will be carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan will be developed for these works in accordance with the site's health and safety requirements. | As required through the project Operational Management Plan / Health and Safety Plan. |
| **Population and Human Health** | | | | |
| MM64 | Health and Safety | EIAR Chapter 5 | All activities carried out during the operational phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act. | As required through the project Operational Management Plan. |
| **Ornithology** | | | | |
| MM65 | Bird protection | EIAR Chapter 7 | Where construction works are required during the breeding bird season (1st March to 31st August inclusive), mitigation measures to limit the impact of vehicular disturbance will be implemented. This will include no idling of vehicles, appropriate speed restrictions and dust suppression measures on site. | As required through the Contractor's CEMP. |
| | | | If significant operational works (for example widespread track upgrades or turbine replacement) be required during the breeding bird season (1st March to 31st August inclusive), the mitigation measures outlined for the pre-construction and construction phases will be implemented. | |
| **Land, Soils and Geology** | | | | |
| MM66 | Contamination Management | EIAR Chapter 8 | Oil containing components of the wind turbines will be periodically refurbished and replaced. | As required by the project Operational Management Plan. |
| | | | Fuel and oil storage and handling requirements will be as detailed for construction, with permanent fuel and oil storage located within permanent covered bunds. | |
| | | | Welfare facilities will be provided at the substation location. These welfare facilities will produce foul effluent and these effluents will be stored in a holding tank prior to removal to an approved treatment facility. | |

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| **Hydrology and Hydrogeology** | | | | |
| MM67 | Surface Water Management Plan | EIAR Chapter 9 and EIAR Appendix 2-8 | The Surface Water Management Plan will continue to be implemented in the operational phase. | As required through the SWMP. |
| **Shadow Flicker** | | | | |
| MM68 | Turbine Shutdown | EIAR Chapter 10 | Due to the potential for shadow flicker to affect receptors within the shadow flicker study area, it is proposed that a shadow control system will be installed on each of the wind turbines that have the potential to cause shadow flicker for sensitive receptors. The control system will detect and calculate, in real-time:<br>• Whether shadow flicker has the potential to affect nearby properties, based on pre-programmed co-ordinates for the properties and turbines outlined in this assessment;<br>• Wind speed (can effect how fast the proposed turbine will turn and how quickly the flicker will occur);<br>• Wind direction;<br>• The intensity of the sunlight.<br>When the sunlight is strong enough to cast a shadow, and the shadow falls on a property or properties, then the proposed turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the affected properties. | As required through the Turbine Shutdown Scheme. |
| | | | A Turbine Shutdown Scheme will be the primary mitigation measures for the shadow flicker effect and will be implemented for the proposed project based on the predicted shadow flicker at each shadow flicker receptor. The Turbine Shutdown Scheme will be employed to ensure that shadow flicker does not occur at the affected property(s). A process will be established by the proposed wind farm operator whereby local residents can highlight any concerns or complaints about the operation of the scheme. All concerns raised will be investigated by the proposed wind farm operator and the turbine shutdown software adjusted accordingly, to ensure that the turbines shut down at the appropriate time. After adjustments are made to the software, the flicker occurrence will be monitored where the residents still report flicker occurrence. This will determine any further adjustments that might be required to shut down times for any given turbine. | |

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| | | | If there is sufficient existing screening at a shadow flicker receptor, the Turbine Shutdown Scheme may not be necessary for that receptor. The Applicant will engage with any affected residents to investigate options for new or additional screening measures (such as planting vegetation to act as a screen or installation of suitable window blinds in the affected rooms of the residence) where appropriate and agreeable to the affected residents. If screening is not acceptable and/or will not be effective the Turbine Shutdown scheme as set out in Chapter 10 will be implemented to ensure 'near zero shadow flicker'.<br>Where agreed screening measures are implemented, the effectiveness of the measures will be monitored and if the measures are not functioning to the satisfaction of the property owner/occupant, they will be included in the Turbine Shutdown Scheme as set out in Chapter 10. | |
| **Material Assets** | | | | |
| MM69 | Aviation | EIAR Chapter 11 | The following standard practices will be undertaken:<br>• The turbines will be included in the IAA Electronic Air Navigation Obstacle Dataset;<br>• Lighting of the proposed wind turbines in the interest of aviation safe-guarding (i.e., an aeronautical warning light scheme), as the proposed project would be considered as an en-route obstacle, will be required, will be agreed with the IAA, and Irish Air Corps prior to operation; and<br>• As-constructed coordinates of the turbines will be provided to the IAA. | To be agreed with the relevant stakeholders. |
| **Noise and Vibration** | | | | |
| MM70 | Noise and Vibration | EIAR Chapter 12 | In the event of a complaint indicating potential excessive amplitude modulation or tonality associated with the proposed project, the operator will fully investigate the complaint in collaboration with the turbine manufacturer, through review of the meteorological periods and conditions during which the reported AM or tonality occurs. A noise monitoring protocol would be established, in consultation with the local authority, which would set out the location and analysis methodology to be employed for the noise monitoring. This can be secured via a planning condition.<br>If an ongoing issue with excessive AM is established, a mitigation strategy to reduce the level of AM will be implemented through engineering methods, operational changes and/or curtailment of | As required by the project Operational Management Plan. |

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| | | | specific turbines. The operator would first appoint a qualified acoustic consultant to objectively assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise (9 August 2016) or subsequent revisions.<br>The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', provide a robust and reliable indicator of AM and yield important objective information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including methods2, determined in liaison with the turbine manufacturer, to minimise the occurrence of excessive AM. Examples of mitigation measures which could be considered include turbine blade modifications, the implementation of specific operational controls for the relevant turbine type or operating turbines in different operational modes or turbine curtailment under specific operational conditions. The aim of the mitigation would be to minimise adverse impacts from excessive AM associated with the proposed project as much as is reasonably practicable.<br>Similarly, if the complaints suggest the potential occurrence of clearly audible tonality in the wind turbine noise, the audibility of the tones will be investigated from measured data with a robust, objective method such as that included in ISO 1996-2:2017. If persistent occurrence of clearly audible tonality is identified, then the operator would liaise with the turbine manufacturer to investigate and implement measures to mitigate or minimise the occurrence of tonality as much as is reasonably practicable. This may also involve engineering methods or turbine operational changes for example.<br>The commitment outlined to control amplitude modulation (AM) from wind turbines are considered best practice. The proposed approach provides a clear commitment that additional adverse impacts from excessive amplitude modulation (AM) or tonality associated with the operation of the proposed project will be effectively managed and minimised by the operator. | |

[2] See for example: Cand M. and Bullmore A. (2015), Measurements demonstrating mitigation of far-field AM from wind turbines. 6th International Meeting on Wind Turbine Noise Glasgow, 2015.

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| MM71 | Noise - Amplitude Modulation | EIAR Chapter 12 | Prior to the commissioning of the wind farm, the developer will submit a Noise Complaint Monitoring Programme (NCMP) to the planning authority for written agreement. The NCMP will include a detailed methodology for noise measurement procedures for recording results and a protocol for managing complaints.<br>Compliance noise surveys will be undertaken to verify compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a wind farm being commissioned. The guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be taken into account.<br>In the unlikely event that an exceedance of the noise criteria is identified as part of the commissioning assessment and relevant corrective actions taken. For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure turbine noise levels are within the relevant noise criterion or conditions turbine noise limits. Such curtailment can be applied using the wind farm SCADA system with a marginal reduction of the wind turbine performance. | |
| **Air Quality and Climate** | | | | |
| MM72 | Air Quality / Monitoring | EIAR Chapter 14 | To determine if any short-term dust impacts will occur, a minimum of daily visual inspections for dust soiling of receptors (including roads, and surfaces such as street furniture, cars and windowsills) adjoining the construction works areas will be undertaken. Inspection results will be recorded in the site inspection log. Cleaning will be provided if necessary, such as in the event of a dust complaint resulting from the Proposed Scheme construction works. The potential for dust generation increases when rainfall is less than 0.2 mm/day and at wind speeds of greater than 10 m/s. To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as 12 hour rainfall radar showing anticipated amounts of precipitation in mm.<br>The frequency of site inspections by the Environmental Manager responsible for dust management will be increased to a minimum of twice daily during the above conditions. The effectiveness of dust control methods will be monitored via visual inspections and work that would generate dust (e.g. moving materials from stockpiles, or | As required by the Operational Management Plan |

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| | | | transferring loose dry materials from trucks) will be limited in so far as is practicable during these weather conditions. | |
| **Traffic and Transportation** | | | | |
| MM73 | Operational Traffic | EIAR Chapter 16 | In the event that a turbine requires replacing in the future, the proposed TDR at the construction phase will be considered, and the swept path analysis will take into account any road improvements and changes to the network. | As required by the project Operational Management Plan. |
| **Decommissioning Phase** | | | | |
| **Population and Human Health** | | | | |
| MM74 | Decommissioning Activities | EIAR Chapter 5 | All activities carried out by the appointed Contractor during the decommissioning phase will be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| **Biodiversity** | | | | |
| MM75 | Decommissioning activities | EIAR Chapter 6 | Decommissioning impacts are expected to be of a similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration and scale. The mitigation measures implemented during the construction phase are applicable for the decommissioning phase too. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| **Ornithology** | | | | |
| MM76 | Bird protection | EIAR Chapter 7 | The mitigation measures outlined for the pre-construction and construction phases regarding works during bird nesting season will be implemented to ensure compliance with relevant legislation. | As required through the Contractor's CEMP. |
| **Land, Soils and Geology** | | | | |
| MM77 | Decommissioning activities | EIAR Chapter 8 | The risks arising from the decommissioning of the proposed project would be less than those for construction. Mitigation measures for decommissioning would conform to those given for construction in Chapter 8 and would be anticipated to be fully protective of the environment.<br>There are no works proposed in relation to decommissioning phase works for the proposed GCO or on the works areas of the proposed TDR. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| **Hydrology and Hydrogeology** | | | | |
| MM78 | Decommissioning activities | EIAR Chapter 9 | Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. Some of the significant potential effects will be avoided by leaving elements of the proposed wind farm site in place. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |

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| | | | The hydrocarbon interceptor will be in place at the proposed substation site with regular inspection and maintenance, to ensure optimal performance.<br>Given the requirement for sanitary facilities during decommissioning works, wastewater effluent will continue to be directed to the on-site holding tank, from where it will be tankered off-site to a suitably licensed wastewater treatment plant.<br>The decommissioning phase will not require any significant works that will potentially affect the drainage network. A fuel management plan to avoid contamination by fuel leakage during decommissioning works will be implemented as per the construction phase mitigation measures.<br>Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures in Chapter 9. | |
| MM79 | Surface Water Quality | EIAR Chapter 9 | SuDS measures will remain in place during the decommissioning period. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| **Material Assets** | | | | |
| MM80 | Waste management | EIAR Chapter 11 | Appropriately permitted waste collectors will be employed to remove any municipal waste, wastewater, or demolition waste generated within the wind farm site. The majority of wastes from decommissioned infrastructure will be recyclable, and the large items (turbines, met mast) will be collected and processed by appropriately licensed specialist companies with the capability to process these items correctly. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| | | | Appropriately permitted waste collectors will be employed to remove any municipal waste, wastewater, or demolition waste generated within the wind farm site. The majority of wastes from decommissioned infrastructure will be recyclable, and the large items (turbines, met mast) will be collected and processed by appropriately licensed specialist companies with the capability to process these items correctly. | |
| **Noise and Vibration** | | | | |
| MM81 | Noise and Vibration | EIAR Chapter 12 | In relation to the decommissioning phase, similar overall noise levels as those calculated for the construction phase would be expected, as similar tools and equipment will be used. The noise and vibration impacts associated with any decommissioning of the proposed project can be considered comparable to those outlined in relation to the | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |

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| | | | construction phase albeit less works will be required as only above ground structures will be removed.<br>The Contractor undertaking the construction and decommissioning works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration. | |
| **Air Quality and Climate** | | | | |
| MM82 | Air Quality: Decommissioning activities | EIAR Chapter 14 | The same mitigation measures implemented during the construction phase will be applied during the decommissioning works for the management of dust. | As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning. |
| **Traffic and Transportation** | | | | |
| MM83 | Decommissioning Activities and Traffic | EIAR Chapter 16 | A detailed TMP will be undertaken and will consider any road improvements and changes to the network. The plan will also consider the future baseline traffic in order to minimise the decommissioning phase effects in the vicinity. | As required by the agreed decommissioning plan and TMP / mitigation measures agreed at the time of decommissioning. |