Proposed Ballynalacken Windfarm Project

Environmental Impact Assessment Report

Chapter 19: Mitigation & Monitoring Arrangements

March 2025

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EIAR 19 Mitigation & Monitoring Arrangements

EIAR 19.1 Introduction

Mitigation measures which are envisaged to avoid, prevent, reduce or offset adverse effects of the Ballynalacken Windfarm Project to the environment are set out in the sections below. The mitigation measures and monitoring arrangements have been developed by the EIA Topic competent experts in collaboration with the Project Design Team and the EIA Co-ordinators.

The primary mitigation for the Ballynalacken Windfarm Project is mitigation by avoidance i.e. the design of the Project through the consideration of alternative locations, layouts, size and scale, as set out in Chapter 4: Alternatives Considered. For effects that cannot be avoided through consideration of alternatives, mitigation by prevention, reduction or offsetting are proposed. These are listed in Section 21.2 below. The expected effectiveness of the mitigation measures is provided within the topic chapters. The potential for mitigation measures to cause indirect effects has been considered in Chapter 20 Interaction of the Foregoing.

Monitoring is also proposed to take place after consent is granted, in order to check that proposed processes and measures are operating as intended and that the Project in practice conforms to the predictions made during the EIA process and to record any unforeseen effects or non-compliance with consent conditions in order to undertake appropriate remedial.

EIAR 19.2 Construction Phase Mitigation Measures & Monitoring Arrangements

The following Environmental Protection Measures will apply during the construction phase of the Ballynalacken Windfarm Project:

EIAR 19.2.1 Construction Phase Surveying, Monitoring, Inspection & Supervision

SM No.	Surveying & Monitoring Measure (SM)
	Preconstruction Surveying & Monitoring
SM01	A suitably qualified geotechnical engineer will review and approve the civil contractor's method statements and final detailed design prior to the commencement of construction works.
SM02	Confirmatory surface water quality monitoring will be carried out prior to the commencement of construction works at the water quality monitoring locations to determine the current status of surface water quality in downstream watercourses. This monitoring will include laboratory analysis of water samples which will be carried out by an independent and appropriately certified laboratory. The monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Clerk of Works, who will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan which forms part of the Ballynalacken Windfarm Project Environmental Management Plan. Records will be kept of biological and chemical monitoring undertaken carried out prior to the commencement of construction works.
SM03	No invasive species, other than Cherry Laurel, were recorded within the Construction Works Area Boundary during pre-planning surveys, however pre-construction surveys of the Construction Works Areas plus 7m will be carried out in order to determine if any new infestations have been established in the interim period. These pre-construction confirmatory surveys for invasive species will be carried out by the Project Ecologist to accurately determine the extent of new invasive species infestations. Mapping, showing the most up to date

SM No.	Surveying & Monitoring Measure (SM)
	distribution and extent of each infestation, will be distributed to the Environmental Clerk of Works and to the Project Engineer.
SM04	No Otter holts were recorded within the Construction Works Area Boundary or within 150m upstream or downstream of watercourse crossing locations during pre-planning surveys, however pre-construction surveys will be carried out in order to determine if any new holts have been established in the interim period. These pre-construction confirmatory surveys for Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
SM05	No Kingfisher nests were recorded within the Construction Works Area Boundary or within 300m upstream or downstream of watercourse crossing locations during pre-planning surveys, however pre-construction surveys will be carried out in order to determine if any new nests have been established in the interim period. These pre-construction confirmatory surveys will be carried out by a suitably qualified Ornithologist within the Construction Works Area Boundary and within 300m upstream or downstream of watercourse crossing locations and will be undertaken between March and April (early visit) and again between May and June (late visit).
SM06	No Badger setts were recorded within the Construction Works Area (CWA) Boundary or within 50m of the CWA Boundary during pre-planning surveys, however pre-construction surveys will be carried out in order to determine if any new setts have been established in the interim period. These pre-construction confirmatory surveys will be carried out by the Project Ecologist within the Construction Works Area (CWA) boundary and within 50m of either side of the CWA Boundary and carried out no more than 10-12 months in advance of proposed construction activities.
SM07	One tree within 150m of the Construction Works Area Boundary was identified as a bat roost during pre-planning surveys. Pre-construction confirmatory surveys will be carried out at this tree to identify any changes in the interim period since initial pre-planning surveys. Surveys will be carried out by the Project Ecologist at a time of year that is appropriate to the type of roost e.g. June to August for maternity roosts, or November to February for hibernation roosts. If the location or status of roosts has changed, then the use of lighting at nearby construction works locations will be adapted accordingly by the Project Ecologist.
SM08	In advance of construction works taking place, licenced advance archaeological surveys/investigations will be carried out at identified locations within the construction works area boundary. These surveys will include photographic surveys, townland/civil parish boundary surveys, wade and detection surveys, built heritage surveys, geophysical surveys and archaeological test trenching. The nature and scope of these surveys will be agreed with the National Monuments Service (NMS).
SM09	Confirmatory condition surveys involving pre-construction and post-construction inspections, high-definition video surveys and FWD surveys will be undertaken along the routes of concentrated construction traffic between the R694 and the windfarm Site Entrances and along the route of the Internal Cable Link and of the Ballynalacken Grid Connection route.
SM10	Confirmatory consultations with Uisce Eireann, Eir, ESB Networks, and Gas Networks Ireland and confirmatory ground surveys at service locations will be carried out ahead of, and throughout, the cabling, site entrance and haul route works in close proximity to existing overhead and underground services.
SM11	The construction Method Statements to be developed by the construction contractors will take full account of the EMP including the mitigation and monitoring measures and will be reviewed by the Environmental Manger prior to the commencement of construction works.
	During Construction Surveying & Monitoring
SM12	All construction works will be monitored for compliance with the Environmental Management Plan by the project Environmental Management Team which will include an Environmental Clerk of Works, the Project

SM No.	Surveying & Monitoring Measure (SM)
	Ecologist and specialists such as a hydrologist, who are independent of the site contractors. The Environmental Management Team will report to the owner's Project Manager.
SM13	A Landowner Liaison Officer (LLO) will be appointed and will monitor the erection and maintenance of the Construction Works Area boundary fences and will liaise with the landowners regarding the location of access gateways along the fence, and of livestock water supply pipes and livestock water supply sources (agricultural landowners only). The LLO will keep the landowners up to date with relevant construction work schedules.
SM14	A suitably qualified engineer will supervise all windfarm site excavations and construction works.
SM15	The windfarm drainage network will be inspected regularly during the construction phase under the following schedule: Daily visual inspections by the Contractor of silt fencing and settlement ponds; Weekly inspections by the Contractor of the drainage network; Monthly site inspections of the drainage network by the Project hydrologist during construction phase and for a period of 6 months following construction; Event based inspections by the Contractor as follows: >10 mm/hr (i.e. high intensity localised rainfall event); or >25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or, rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). All inspections will include all elements of the drainage systems to ensure that the systems are operating correctly. Inspections will examine the functioning of the various elements of the drainage system, and if evidence of sedimentation or scouring and any changes in the drainage water including discolouration, odour, oily sheen or the presence of litter, then the required corrective maintenance or actions will be identified and will be implemented immediately the Contractor.
SM16	Surface water quality monitoring of watercourses downstream of the works will be carried out at regular intervals by the Environmental Management team during the construction phase. This monitoring will be carried out at the water quality monitoring locations to check that the pre-construction downstream water quality status is maintained. The monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Management team, who will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan which forms part of the Ballynalacken Windfarm Project Environmental Management Plan. If monitoring identifies sediment or contaminant polluted waters, then the Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop construction works at the Project site in order to establish the cause of the pollution, and if caused by the Project, then the Contractor will implement the necessary actions and measures to resolve the cause of the pollution. In addition, a mobile 'Siltbuster' or similar equivalent specialist treatment system will be used at the windfarm site within the Owveg River catchment and can be mobilised on-site (wind farm site) at short notice for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Records will be kept of biological and chemical monitoring undertaken before, during and after the works. Records will also be kept of inspections of proposed surface water mitigation measures. These records will be made available upon request to any authorised person as defined under the Local Government (Water Pollution) Acts.
SM17	At D1 and D2, monitoring of Q values and sediment build up will be carried out immediately downstream of the dam locations at D1 and D2. This monitoring will be conducted throughout the construction works at D1 and D2, and also conducted as part of surface water monitoring in order to confirm that the Q values and sediment levels return to baseline levels. Prior to dam being removed at D1 or D2, where sediment build up poses significant downstream effects on the watercourse, this sediment will be removed.
SM18	The plant and machinery will be regularly inspected for leaks and maintained in good working order for the duration of the works.

SM No.	Surveying & Monitoring Measure (SM)
SM19	Fuel, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage.
SM20	The Project Ecologist will liaise with the Contractors on a weekly basis regarding the upcoming schedule of works and will advise the Contractors of any particular ecological protection requirements at specific locations on site.
SM21	No invasive species, other than Cherry Laurel, were recorded within the Construction Works Area Boundary during pre-planning surveys, however should a new infestation of invasive species be established in the interim period, any excavation works in close proximity (7m) to the new infestation location will be carried out under the direct supervision of an ecologist with prior experience of this type of work.
SM22	Visual inspections will be carried out by the Contractor on all machinery and equipment (particularly for machinery and equipment which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris. Any attached or adherent material will be removed before entering or leaving the site, securely stored away from traffic for removal to the waste storage area in the temporary construction compound at the Ballynalacken site.
SM23	During working hours, the construction contractor will monitor dust control methods. The Environmental Clerk of Works will monitor weather forecasts for dry and windy conditions and will carry out weekly on-site and off-site inspections to monitor dust caused by the construction works. Public roads Construction Works Areas will be regularly inspected for cleanliness and regular dust soiling checks of surfaces within 100m of site boundary will also be carried out. The frequency of monitoring will be increased when construction activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
SM24	All plant and machinery which will be used during construction will be fit for purpose and in good working order prior to mobilisation to works areas
SM25	Monitoring of noise and vibration will be carried out at a number of nearby residences during critical periods of the construction works.
SM26	Archaeological Monitoring of initial groundworks at identified locations will be carried out by the Project Archaeologist under licence during construction works. The nature/scope of the groundworks monitoring will be agreed with the National Monuments Service (NMS). Should a new discovery be made during advance archaeological surveys/investigations or during archaeological monitoring of initial construction groundworks that is considered to be highly important by reason of its historical, architectural, traditional, artistic, cultural or archaeological interest, then the Environmental Clerk of Works, in conjunction with the Project Archaeologist, will determine its preservation requirements in consultation with the relevant authorities and in accordance with regulatory and legal requirements.
SM27	The construction of the Ballynalacken Windfarm Project will be carried out in accordance with an Environmental Management Plan (EMP). The EMP will include all of the mitigation measures and monitoring arrangements for the Project. An Environmental Clerk of Works will be appointed, independent of the main construction Contractor, and will carry out weekly audits on EMP compliance. If non-compliance is detected, then, prompt corrective action will be agreed and committed to by the Contractor, with a view to the swift and effective resolution of any deviations from the EMP requirements. The EMP will be an important contract document for the main construction contractor (Contractor) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Clerk of Works. Furthermore, if a significant unforeseen environmental effect takes place, then, the Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works at the works location until the issue is resolved.

EIAR 19.2.2 Construction Phase Mitigation Measures

MM No.	Mitigation Measure (MM)
MM01	The boundaries of the Construction Works Area will be fenced to prevent the encroachment of construction phase personnel, machinery or materials beyond this boundary. In agricultural lands, livestock proof fencing will be used, with landowner access maintained through the provision of gates along the boundary fences.
MM02	Construction traffic, personnel and materials will be restricted to within the Construction Works Area Boundary fence. Machinery will be kept on the windfarm site roads and hardstanding areas, and, aside from advancing excavations, will avoid moving onto areas not delineated on the site drawings
MM03	Land reinstatement will not be carried out during very wet weather or when the soil is waterlogged. If any compaction has occurred along the construction works area, these areas will be ploughed with a sub-soiler to loosen the subsoil layer.
MM04	The excavation of materials will be completed in accordance with best practices for the management and treatment of such materials. (i.e. British Standards BS6031:2009 Code of Practice for Earthworks).
MM05	During windfarm construction works, excavations will be backfilled as soon as is possible.
MM06	During windfarm construction works, excavated material will be removed for temporary or permanent storage at designated berms and with the exception of T3 and Borrow Pit No.2, will be placed more than 50m away from any watercourse or wet drainage feature. Temporary silt control methods such as silt fencing will be placed around all overburden storage areas and the existing vegetative between the berms and watercourse / drainage features will be left in place.
MM07	All storage berms will be graded and sealed following emplacement. Topsoil and subsoil will be stockpiled separately. The upper vegetative layer (where still present) of excavated soil 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 spoil within the storage areas. Re-seeding will also be carried out in these areas. Measures such as interceptor ditches around the bases of these areas, sediment traps, covering of berms will also be incorporated to prevent runoff of suspended solids, dust and soil erosion.
MM08	Along the cable route on the public road, there will be no storage of overburden and all excavations from road trenches will be removed to licensed waste facilities in accordance with the Waste Management Plan. The excavated material will be covered during transportation to prevent spillages and reduce dust.
MM09	All excavations which are unsuitable for use as construction/reinstatement material which arise within the catchment of the Owveg River (T9, T10, T11 and T12 and associated Windfarm Site Roads) will not be stored within the catchment, instead these arisings will be transported to the temporary deposition area at Borrow Pit No.2 and at Turbine T7 (both located outside of the Owveg River catchment). In addition, a Siltbuster or other suitable treatment train will be used to remove fine silt particles from site runoff in this catchment. The Siltbuster will be set up at works locations and used during groundworks and earthmoving activities.
MM10	At the windfarm site, at works locations within 50m of watercourses or existing drainage features there will be additional mitigation measures deployed including double silt fencing prior to the commencement of the works, temporary drain blocking in existing drains, placement of silt trapping arrangements along preferential surface water flowpaths and, where necessary, the use of matting to prevent ground erosion and rutting. Works will not take place within this zone during prolonged heavy or exceptional rainfall events.
MM11	Weather forecasts will be consulted in advance of works. If there is heavy prolonged rainfall or if an exceptional rainfall event occurs, then construction works will cease until peak flows have subsided.

MM No.	Mitigation Measure (MM)
MM12	Windfarm site roads and hardstanding areas are designed to have a permanent surface water drainage network in place. Temporary works areas, including the borrow pits and temporary compounds will have a temporary surface water drainage network in place during works. The drainage infrastructure will not be installed during heavy or prolonged rainfall events or when the soil is waterlogged. The site drainage network will ensure that all surface water runoff from upgraded roads and new road surfaces (including hardstand areas) will be captured and treated prior to discharge/release. Transverse drains ('grips') will be constructed, where appropriate, in the surface layer of access tracks to divert any runoff into swales/track side drains; The site drainage network will include check dams and settlement ponds which will settle suspended solids in water runoff while also slowing down the rate of water run-off from these areas. Water will be released to surrounding vegetation at regular intervals via buffered outfall weirs, which also form part of the drainage network.
MM13	It is proposed that bedrock won from the on-site borrow pits during the construction phase (i.e. sandstones) will only be used to construct the sub-base layer of proposed upgraded and new access roads and hardstand areas. Once installed the sub-base layer will be overlain by a capping layer of clean high-grade bedrock, such as limestone, which will be sourced from local quarries. This will be ongoing during the operational phase as during road maintenance.
MM14	At the windfarm site, where dewatering of excavations is required, no freshly pumped water will be permitted to enter the existing drainage network directly or be pumped out onto adjacent habitat. Rather, all pumped water will be treated prior to discharge using an infiltration trench or settlement pond or suitable water treatment train such as a Siltbuster, as appropriate.
MM15	Along the cable routes, where dewatering of trenches or excavations is required, there will be no direct discharge of treated water into any watercourse or drain. Rather, all pumped water will be discharged via a silt bag.
MM16	All new watercourse crossing structures will be sized to cope with a minimum 100-year flood event. In all cases, culverts will be oversized to allow mammals to pass through the culvert. The construction of new watercourse crossing structures will be carried out in accordance with the Office of Public Works (OPW) Guidelines Construction, Replacement or Alteration of Bridges and Culverts (2013), and also with the Department of Transport, Tourism & Sport Guidelines for Managing Openings in Public Roads (April 2017).
MM17	New culverts which will be installed at watercourses or wet drainage channels will be bottomless or clear spanning.
MM18	In-stream works will not be undertaken without isolation of flow within the watercourse. A pre-works survey will be carried out by the Project Ecologist and any fish, if present, within the isolated section will be removed using electrofishing and transferred immediately downstream of the crossing point and placed back in the water. The water will be isolated from the works by over pumping, flume (pipe) or channel diversion methods.
MM19	At wet drainage channels, instream works will be followed by site-specific reinstatement measures to ensure the restoration of flow character and morphology within the affected reach. Measures will include: bank stabilisation using boulder armour or willow/brush bank protection; reinstatement of bank slope and character, creation of compound channels where necessary; reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and planting along the riparian margin to stabilise banks, add flood protection and provide riparian buffer.
MM20	Only precast concrete culverts will be used for new watercourse crossing structures on the windfarm site. Only precast concrete chambers will be used at Joint Bay locations.
MM21	Concrete control procedures will be implemented and will include the following:

MM No.	Mitigation Measure (MM)
	• No batching of concrete will take place on site, all concrete will be ready-mixed and delivered to site just-in-time; • Dry granular cement will be used in the grid connection cable trench, and for internal cable trenches where they occur within the public road corridor; • The pouring of concrete will be scheduled for dry days. If a sudden rainfall event should occur, then plastic covers will be ready and available at the pour site to cover the concrete. • The pour site will be kept free of standing water; • A designated trained operator experienced in working with concrete will be employed during the concrete pouring phase; • Run-off from wind turbine foundation concrete pours will not be permitted to flow over adjacent lands or enter drainage channels. The run-off will be contained within the foundation area and pumped into a skip to settle out; settled solids will be appropriately disposed of off-site. • Concrete trucks will be washed out at the supplier's facilities and not on site. The only concrete washing that will occur on site is the hand washing of the chutes at the rear of the trucks. Washing of chutes will only take place at the designated area and into a Roadside Concrete Washout unit. For the cabling sites along the public road, the rear chutes will be washed out at the works locations into the cable trench. • No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed
MM22	<u>Fuel/Oil control procedures</u> will be implemented and will include the following: • On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double axel custom-built refuelling trailer, will be refuelled off-site, and will be towed around the site by a 4x4 jeep to where machinery is located. The 4x4 jeep will carry fuel absorbent material and pads in the event of any accidental spillage. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. • In addition, spill response apparatus including spill-kits and fuel absorbent mats will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in the implementation of the Emergency Response Plan, as contained in the Environmental Management Plan. • The fuel bowser will be parked on a level area, away from main traffic activity, in a designated part of the construction compounds when not in use. Taps, nozzles or valves associated with mobile fuel bowser will be fitted with a lock system. Only designated trained and competent operatives will be authorised to refuel plant on site. A Permit to Fuel system will be put in place.
MM23	There will be no refuelling of vehicles or plant permitted within 100m of a watercourse or wet drainage channel or local spring/well.
MM24	All fuels or oils, required during construction, will be stored in a designated, bunded, locked storage area within the temporary compounds. All fuel storage areas will be bunded appropriately to 110% of the volume of oils/fuels each area contains 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, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage. Safety data sheets for all chemicals used will be kept on-site. An emergency response plan for the construction phase to deal with accidental spillages is contained within the Environmental Management Plan.
MM25	Overnight parking of plant and machinery will only be permitted at locations which are greater than 50m from watercourse/drainage features and at an existing hard-core surface. Drip trays and fuel traps will be used under and around parked plant and machinery to contain any leaks.

MM No.	Mitigation Measure (MM)
MM26	All associated tree felling will be undertaken using good working practices as outlined by the Forest Service in their 'Forestry Harvesting and Environment Guidelines' (2000) and the 'Forestry and Water Quality Guidelines '(2000). Measures will include the protection of the riparian zones, installation of buffered drainage outfalls, installation of drains and silt traps as soon as possible once felling has been completed, and a regime of continued monitoring of silt traps and drainage outfalls will be implemented. All excess felled brash will be removed off site to avoid release and runoff of phosphorous into sensitive watercourses.
MM27	In-stream works in wet drainage channels (D1, D2) will only be undertaken during the IFI specified period (July, August and September) and will be carried out in accordance with the *Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters* (IFI, 2016).
MM28	Works at W2 and W3 will take place when the Rathduff_15 is in its dry state and the works at W2 or W3 will be planned for periods of dry weather.
MM29	The infestation of Cherry Laurel will be removed prior to the commencement of construction works. Any plant material and stems and roots treated with herbicide and any remains disposed of via biohazard best practice with regards to managing invasive plant species in accordance with Maguire *et al. (*2008).
MM30	No Japanese Knotweed was recorded within the Construction Works Area Boundary during pre-planning surveys, however, should a new infestation of Japanese knotweed within 7m of works, then the infestation will be covered with high density polyethylene grass carpet terram prior to any works commencing at the location. The covering of any new infestations will only be carried out under the direct supervision of an ecologist with prior experience of this type of work, and the works within 7m of the infestation will also be under the direct supervision of an ecologist with prior experience of invasive species.
MM31	A buffer of at least 15m from the Construction Works Area boundary will be maintained to minor watercourses and land drains (except where they are crossed by tracks or, in the case of minor land drains, where a lesser buffer is applied or where the drain is re-directed)
MM32	No Otter holts were recorded within 150m upstream or downstream of watercourse crossing locations during pre-planning surveys, however should a new holt be identified in the interim period during pre-construction surveys (*see SM04*), then all construction works within 150m of the active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer/outside of 1 hours after sunrise or before sunset during winter. If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken while cubs are present in the holt and NPWS will be notified immediately. Except under license, no wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand or scrub clearance will not take place within 15m of such holts. The prohibited working area associated with otter holts will, where appropriate, be fenced with temporary fencing prior to any invasive works and declared as 'out of bounds'. Appropriate awareness of the purpose of the enclosure will be conveyed through toolbox talks with site personnel and sufficient signage will be placed on each exclusion fence. All contractors or operators on site will be made fully aware of the procedures pertaining to each affected holt and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to Local Authorities and relevant Statutory Consultees.
MM33	The construction phase and operational phase fencing will be designed to facilitate the passage of wildlife, including badgers and otters. This will be facilitated through the installation of wildlife-passage gates (e.g. badger gates) at regular intervals or at sensitive locations along the new fence line. The Site Ecologist will advise on the location and design of the wildlife-passage gates.
MM34	Road traffic speed limits of 30km/hr along the local roads L5840 and L5845 at the windfarm site and along the L58442 in Tinnalintan and of 15km/hr along on-site roads throughout project site during the construction

MM No.	Mitigation Measure (MM)
	and decommissioning phases. Should an Otter fatality occur, then the Project Ecologist will identify appropriate additional measures which will be implemented in areas that show to be high activity road crossing points for Otter.
MM35	No Badger setts were recorded within the Construction Works Area (CWA) Boundary or within 50m of the CWA Boundary during pre-planning surveys, however should a new sett be identified in the interim period during pre-construction surveys (*see SM06*), then NWPS will be notified immediately and derogation licenses will be secured in consultation with NPWS to ensure the proposed works cause as limited an effect as possible.
MM36	Security lighting will be used at the Temporary Construction Compounds, Tinnalintan Substation and at the Windfarm Control Building. All lighting will be cowled in order to prevent light spill, and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.
MM37	Plant and machinery will not be permitted to idle and any plant operating within 200m of a bat roost will be fitted with noise dampeners and surrounded by an acoustic enclosure or portable screen.
MM38	A buffer area of 50m from the tips of Turbine blades to any trees or hedgerows, will be created through the felling of forestry and the removal of hedgerows and trees during the construction phase.
MM39	Forestry felling will be completed at least 6 months prior to the commencement of operation of the wind turbines.
MM40	Project Ecologist to supervise the placement of bat boxes to compensate for any loss through disturbance of potential roosts and provide alternative roosting locations for bats roosting in BL2 and TR1.
MM41	1.5km of new hedgerows will be planted during the construction phase. These new hedgerows will include c.43 no. trees (i.e. a new tree will be planted at 35-40m intervals in new hedges). 4.1km of existing hedgerow will be improved by interplanting new hedging into gaps in existing field boundaries. All new hedgerows and enhancement of hedgerows will take place outside of bat buffer zones. Hedgerows will be located to encourage bats to commute away from the turbines. These hedgerows will also be used to screen visibility of the turbines from cultural heritage sites in the locality. A mix of native fruiting hedge species will be used for any new hedgerows and will comprise of hawthorn, along with blackthorn, holly, hazel, guelder rose, spindle, crab apple, and bird cherry. New trees will comprise a mix of native species such as oak, alder, birch, crab apple bird cherry and rowan. Hedging and trees will be of Irish provenance. Hedging plants will be sourced from Department of Agriculture approved nurseries.
MM42	Hedgerow removal, tree felling, and scrub clearance will take place outside of the bird breeding season (1st March to the 31st of August).
MM43	Surveys by the Site Ecologist of suitable habitat for active passerine and wader nests, prior to ground/vegetation clearance works in an area.
MM44	Where groundworks in grassland or groundworks or felling in forestry lands, are scheduled to take place during the Meadow Pipit, Curlew, Snipe, Lapwing, or Woodcock breeding season, and where active nests are present and the number of nests represents >1% of the local population, the works within close proximity to an active nest will not be carried out until fledging is completed.
MM45	No Kingfisher nests were recorded within 300m upstream or downstream of watercourse crossing locations during pre-planning surveys (*see SM05*), however should a new nest be identified in the interim period during pre-construction surveys, then no construction activities will be permitted within 300m of Kingfisher nest

MM No.	Mitigation Measure (MM)
	locations during the bird breeding season (March – August inclusive) or until nesting is confirmed as complete following supervision by a suitably qualified Ornithologist.
MM46	To ensure that local roads are kept clean, and site roadways are clear of mud, a road sweeper and dry wheel washes will be used. The dry wheel washes will be installed near the entrance to the public road at Site Entrance No.s 4, 5, and 9. All HGVs and other delivery vehicles, will drive over the wheel wash before leaving the site. The loose debris will be removed regularly from under the dry wheel washes, this material will be removed off site to a licensed facility.
MM47	Any loads of material which have the potential for dust emissions (such as aggregate) will be covered during transportation.
MM48	Construction operations shall generally be restricted to between 0700-1800hrs Monday to Friday, and 0700-1400hrs on Saturdays. Site activities which are likely to create high levels of noise or vibration will be limited to these hours of operation. However, to ensure that optimal use is made of good weather period or at critical periods within the programme (i.e., concrete pours) or to accommodate delivery of large turbine component along public routes it could be necessary on occasion to work outside of these hours.
MM49	A Community Liaison Officer (CLO) will be appointed. The CLO will liaise with and keep the local community up-to-date with relevant construction work schedules, through the use of signage at selected Site Entrances, letter drops to nearest neighbours and through the Project website which will be kept up-to date. The CLO will be the point of contact for local residents for matters relating to noise and vibration. The Environmental Clerk of Works will liaise with the CLO and will be the point of contact between the contractor/developer and the Local Authority regarding any matters relating to noise or vibration from the construction works.
MM50	The Windfarm Site Roads will be maintained to an even surface in order to reduce the potential for vibration from lorries travelling over them.
MM51	Plant and machinery will not be permitted to idle. Machinery used intermittently will be shut down or throttled back to a minimum when not in use, and if any plant/machine is required to operate before 07:00hrs or after 19:00hrs, then it will be surrounded by an acoustic enclosure or portable screen. The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produces by on-site operations. All vehicles and plant will be fitted with effective exhaust silencers. Noise dampeners will be fitted where required.
MM52	The Contractor undertaking the construction of the Ballynalacken Windfarm Project will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of BS5228-1 (BSI 2014a)
MM53	If rock breaking is required at the borrow pits, then the following measures will be employed: the rock-breaking tool will be fitted with a suitably designed muffler or sound reduction equipment (without impairing machine efficiency); to ensure air lines are sealed- all air lines will be checked for leaks; an acoustic screen will be erected between the compressor or generator and noise sensitive area; when possible, the line of sight between the top of the machine and reception point will be obscured; and the breaker or rock drill will be enclosed in a portable or fixed acoustic enclosure with suitable ventilation
MM54	Protective barriers or fencing will be installed/erected at identified cultural heritage features to prevent machinery or plant encroaching on the site/feature and to increase awareness of the presence of the site/feature with the construction personnel.
MM55	Should the presence of archaeological remains be confirmed either during the advance archaeological investigations or archaeological monitoring (see SM08, SM26), further archaeological mitigation, such as preservation in situ and/or full archaeological preservation by record (excavation) will be carried out. The

MM No.	Mitigation Measure (MM)
	appropriate mitigation strategy (i.e., preservation in situ and/or preservation by record) will be agreed in consultation with the NMS. If, during the archaeological enabling works contracts, a new discovery is made that is considered to be highly important by reason of its historical, architectural, traditional, artistic, cultural or archaeological interest, then the Project Manager, in conjunction with the Project Archaeologist, will determine its preservation requirements in consultation with the relevant authorities and in accordance with regulatory and legal requirements
MM56	Telecom operators will be contacted prior to the erection of the permitted wind turbines to confirm (1) requirement for mitigation measure, and (2) form of mitigation measure to be implemented – i.e. one or a combination of (a) change of telecom equipment on the existing masts; (b) change of signal pathways; (c) erection of and installation of telecom apparatus on a new telecom relay pole within the windfarm site boundary; (d) installation of telecom apparatus onto the windfarm met mast.
MM57	'Goal Posts' will be used to identify and highlight the height of nearby overhead lines; all excavation works and use of large plant in close proximity to services will be supervised by a banksman; and a stock of repair materials will be kept at active works locations along the public road.
MM58	The roadside boundary will be maintained during the construction phase and following the removal of the boundary to provide a widened transport area or to provide sightlines, a post and mesh boundary fence will be erected. This boundary will be removed immediately before the transportation of abnormal loads and reinstated immediately after the transportation has been completed.
MM59	Hedgerows and roadside vegetation within the visibility splays will be trimmed and maintained to ensure proper visibility of site entrances.
MM60	Cabling works within the public road network and public road widening will be carried out in co-ordination with Kilkenny County Council and in accordance with "Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads (Department of Transport, Tourism & Sport, 2017).
MM61	Any damage to structures or road pavements along cable routes and along concentrated construction haul routes, because of the construction works and deliveries to the works areas, will be repaired to at least as good a condition as pre-works.
MM62	The Traffic Management Plan will be a key construction contract document and will be implemented to safely coordinate and manage traffic during the construction works. The Traffic Management Plan will be developed in coordination with Kilkenny County Council.
MM63	Flag-men will be used on public roads which will be subject to one lane closure. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the public road network in a in a safe and efficient manner. The works will be carried out according to the Traffic Management Plan which forms part of the Ballynalacken Windfarm Project Environmental Management Plan.
MM64	Local residents likely to be affected by road works, will be kept up to date on works schedules by the Community Liaison Officer.
MM65	The largest traffic volumes are associated with the concrete pours for the turbine foundations. No other deliveries to the windfarm will be scheduled to occur on the same days as the concrete pours.
MM66	The site entrance works, haul route work and road widening works on the L58451, L5845, L5846 and L5840 will not be carried out during peak delivery periods. Where feasible to do so, the road widening works will be

MM No.	Mitigation Measure (MM)
	carried out prior to the main construction period at the windfarm site. In addition, any works on the public road will be completed under licence from Kilkenny County Council Road Section.
MM67	The works along the cable routes on the Local Road L58442 will be carried out during off-peak hours.
MM68	Trenches will be excavated to a distance of c.20m ahead of the ducting works, instead of 50m, where trenches are likely to block access to a property. In addition, steel plating will be available to cover the open trench to ensure access to property is maintained.
MM69	On the L58442 local road along the Internal Cable Link, smaller plant and machinery will be used and this plant and machinery will move off the road (i.e. into a field entrance or gateway) to facilitate access to local residents and maintain access to properties along the full length of the road. The Community Liaison Officer will liaise with local residents in order to determine the peak traffic hours for the local road, and the construction schedule for the Internal Cable Link will reflect the peak usage patterns of the road so that works can occur outside of peak usage periods.
MM70	Service owners of overhead lines in Castlecomer town will be consulted prior to the commencement of haul route works in the town, to request that the overhead lines are rerouted or realigned so that the lines do not impede the turbine component transportation. End users will be notified of any planned outages.
MM71	The horizontal directional drilling works at W3 will be carried out when the Rathduff_15 is in its dry state, to ensure that the works are carried out under a dry stream bed. The drilling works will be carried out by an experienced Drilling Contractor and supervised and managed by a competent and experienced Mud Engineer who understands the technicalities and challenges of drilling works. The Mud Engineer will advise the Construction Manager on the selection of competent drillers for the HDD works; monitor the watercourse bed during drilling works, and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures. From a surface water quality protection perspective, the area around the launch/reception pit, bentonite batching, pumping and recycling plant will be bunded using appropriate terram geotextile and/or sandbags in order to contain any spillages. Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized watertight skip before being taken off-site to a suitably licensed waste facility. In the event of a break-out occurring, the Environmental Emergency Response Procedure for Frac-Out will be implemented which includes the following contingency measures; • In the event of break-out occurring in the stream bed, the rig will immediately shut off the pumps and the drilling assembly will be pulled off to reduce annular pressures; • In the event of break-out on the road an excavator will be available to dig a pit to contain fluid with vacuum trucks/pumps available to transfer drill fluid from the containment point back to the recycling point; and in either scenario, drilling fluid additives designed to plug the formation will be introduced to the circulation system and let set. Environmental Emergency Response Procedures are included in the Ballynalacken Grid Connection Environmental Management Plan.

EIAR 19.3 Operational Phase Mitigation Measures & Monitoring Arrangements

The following Environmental Protection Measures will apply during the operational phase of the Ballynalacken Windfarm Project:

EIAR 19.3.1 Operational Phase Surveying, Monitoring & Supervision

OMM No.	Operational Phase Surveying, Monitoring & Supervision
OMM01	Surface water quality monitoring of watercourses downstream of the works will be carried out monthly for the first six months post construction, and thereafter annually during the Operational Years 1, 2, 3, 4 and 5, and then every 5 years thereafter, to record any change to baseline trends. Samples will be collected by the Environmental Clerks of Works/Asset Manager and analysed by an appropriately certified laboratory and the resulting report submitted to Kilkenny County Council.
OMM02	The Asset Manager will inspect the windfarm site drainage system during quarterly site inspections, and any necessary repairs or maintenance works carried out promptly.
OMM03	Post-construction bat activity and roost surveys will be carried out during the Operational Years 1, 2, 3, 5 and 10 to record any change to baseline roosting and activity trends.
OMM04	Operational Phase bat surveys will include carcass searches at the turbine locations. Carcass search methodology will involve searching a 100m^2 grid square for each turbine. Surveyors will walk a transect path every 5-10m within the square searching visually for carcasses. Due to the difficulty in locating smaller remains such as bats and taking into account the rotor diameter of the turbine blades, where available, specially trained detection dog teams will be used to conduct searches within a 60m radius of each turbine tower instead of visual searches. Detection dog teams have been shown to detect 70-100% of carcasses present where dogs and handlers are proficiently trained and experienced compared to visual searches being only 10-70% efficient depending on searcher expertise and terrain factors (McKeague et al., 2024; Paule et al., 2011). Both carcass search methods will be conducted with efficiency trials and carcass removal rate surveys on site to inform the collision rate estimates based on the number of carcasses found. The results of the operational phase bat surveys will inform further mitigation where the collision rate proves to be higher than predicted based on the field study data presented in this EIAR 2024. These measures are in line with the best practice guidance for post-construction monitoring of onshore windfarms for Bat species (NatureScot, 2021).
OMM05	Confirmatory bird activity surveys, including Fatality monitoring (carcass searches, carcass removal rates and detection efficiency) during Years 1, 2, 3, 5, and every 5 years thereafter of the operational phase. (SNH, 2009).
OMM06	Prior to works along cable routes or public road works for turbine component transportation, the works locations will be surveyed for invasive plant species. Should a new infestation be identified, then the works within 7m of the infestation will also be under the direct supervision of an ecologist with prior experience of invasive species.

EIAR 19.3.2 Operational Phase Mitigation Measures

OMM No.	Operational Phase Mitigation Measure (OMM)
OMM07	The Asset Manager will have responsibility for the implementation of the operational phase mitigation measures and will appoint environmental specialists as required.
OMM08	During any reopening/re-widening of site entrances or haul route works locations, the topsoil removed to reveal the hardcore underneath will be stored in an adjacent temporary deposition area, covered to protect it from weathering, and a silt fence will be erected around this deposition area. Following the completion of the transportation, the hardcore area will be covered over once again using the soil in the deposition area. The area will be reseeded/replanted as appropriate to the location. And if in agricultural lands, the area will we fenced from livestock until revegetation I has occurred.
OMM09	Operational phase traffic, personnel and materials will be restricted to within the Operational Works Area Boundary fence. Machinery will be kept on the windfarm site roads and hardstanding areas, and, aside from advancing excavations, will avoid moving onto areas not delineated on the site drawings
OMM10	The rate of re-vegetation of exposed soils and growth of newly planted hedgerows and trees will be checked by the Asset Manager during quarterly site inspections. Where revegetation is slower than expected, that area will be prepared and re-seeded or replanted in an appropriate manner, as advised by a suitably qualified ecologist.
OMM11	Fuel/Oil control procedures will be implemented and will include the following: • On site re-fuelling of machinery (if required) will be carried out using a mobile double skinned fuel bowser. The fuel bowser, double-axle custom-built refuelling trailer, will be refuelled off-site, and will be towed onto the site by a 4x4 jeep to where machinery is located. The 4x4 jeep will carry fuel absorbent material and pads in the event of any accidental spillage. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. There will be no refuelling of vehicles or plant permitted within 100m of a watercourse or wet drainage channel or local spring/well. • In addition, spill response apparatus including spill-kits and fuel absorbent mats will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in the implementation of the Emergency Response Plan, as contained in the Environmental Management Plan. • All fuels or oils, required during operation, will be stored in a designated, bunded, locked storage area within the substation and control building compounds. All fuel storage areas and the transformer at Tinnalintan Substation will be bunded appropriately to 110% of the volume of oils/fuels relevant for each area/or for the transformer. 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, oil and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage. Safety data sheets for all chemicals used will be kept on-site.
OMM12	The new bat boxes will be checked annually for integrity and will be replaced if necessary.
OMM13	The bat buffer zone will be maintained during operation by trimming existing trees and hedgerows, removing any scrub and additionally no new trees or hedgerows will be planted within the buffer zones. In the buffer zones in forestry areas, following the forestry felling and removal of the brash, the ground surface will be levelled, and the buffer zone will be sown with grass species. A low grass sward will be maintained within this zone to minimise its value as hunting habitat for Kestrel and other birds of prey. This will also minimise the value of these buffer zones to foraging bat species.
OMM14	The rotational speed of the turbine blades when idling during low wind speeds will be reduced by 'feathering' the turbine blades, which means turning the turbine blades parallel to the wind. With feathering in place, the turbines can continue to rotate slowly, but at speeds that pose much less of a risk to bats (Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation - SNH 2019). The feathering will reduce the rotational speed of the turbine blades when idling so they do not exceed 2RPM.

OMM No.	Operational Phase Mitigation Measure (OMM)
OMM15	Operational monitoring (targeting Leisler's Bat and other bat species activity) will be undertaken at each turbine, using automated detectors at ground level, for periods of at least ten nights, during spring (April, May), mid-summer (June, July) and autumn (August, September). Prevailing on-site weather data (temperature, wind speeds and rainfall) will be recorded concurrently with the bat activity monitoring, in order to identify conditions associated with high levels of Leisler's Bat activity. This comprehensive monitoring will be carried out in order to collect sufficient data to inform the development of an effective curtailment strategy for the protection of Leisler's Bat, while avoiding curtailment of operating turbines unnecessarily. The monitoring will identify the periods in which there is risk to Leisler's Bat and will also identify periods where there is little or no risk to Leisler's Bat. For example, a curtailment strategy could comprise the following parameters: If the bats are only active in significant numbers between sunset and sunrise, then curtailment would be targeted only on these periods. Or where bat activity is strongly influenced by weather conditions such as temperature, wind speeds and rainfall, curtailment would reflect the suitable or unsuitable conditions. Where high Leisler's Bat activity is recorded during monitoring, curtailment would be deployed on turbines where the activity occurs when ALL of the following parameters are met: • when wind speeds are below 6 m/s, and • when air temperatures are above 9°C and • between 1st April and 30th September throughout the night (starting 15 minutes prior to sunset and ending 30 minutes after sunrise). If the monitoring indicates that curtailment is required, then the relevant turbines will be curtailed similar to the parameters listed above and will be informed by the data gathered during monitoring. Annual reports on the curtailment strategy will be provided to relevant statutory bodies (where required), detailing the Leisler's Bat activity on-site and the efficacy of the curtailment strategy. The report will also consider the latest bat monitoring and deterrent systems
OMM16	Security lighting at Tinnalintan Substation and at the Windfarm Control Building will be cowled in order to prevent light spill and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.
OMM17	A noise curtailment strategy will be developed and implemented to ensure that the operating windfarm complies with the prescribed operational noise criterion. In order to develop this strategy: (i) a pre-construction noise survey will be carried out to establish the background noise levels and to confirm the applicable wind turbine noise criteria at identified Noise Sensitive Locations (NSL) and (ii) following the commissioning of the Project and the commencement of operation of the wind farm, a second noise survey will be carried out at the NSLs to establish compliance with the noise limit conditions applied to the development. This survey will be carried out according to the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014). Where exceedances are confirmed during surveys, then appropriate sound power operating modes will be activated for specified turbines operating in specified wind conditions as required to reduce noise output when exceedance at a NSL is predicted by the wind turbines computer SCADA software. A third noise survey will be carried following the activation of sound power modes to confirm the effectiveness of the curtailment strategy.
OMM18	In the event of a complaint which indicates potential amplitude modulation (AM) associated with turbine operation, the windfarm operator will employ an independent acoustic consultant to assess the level of AM experienced by the complainant 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. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield valuable information on the frequency and duration of occurrence, which can be used to evaluate mitigation requirements. The mitigation measures, if

OMM No.	Operational Phase Mitigation Measure (OMM)
	required, will consist of the implementation of operational controls on specified turbines, which will curtail or stop the relevant turbines under specific operational conditions, so that OAM is eliminated.
OMM19	The wind turbines will be fitted with a Shadow Flicker Control Module, comprising a central processing unit (CPU) and light sensors. Should a complaint regarding shadow flicker be received from a neighbouring resident, the occurrence of shadow flicker at the receptor will be investigated and the Control Module can be set to automatically turn off the turbine if the defined parameters for shadow flicker events, at a given sensitive receptor, are predicted to occur. This will eliminate shadow flicker at the residence in question.
OMM20	A new berm and hedgerow will be planted on the northern side of the substation compound to provide noise and visual screening of the new substation compound.
OMM21	Screening will be provided through the planning of a native hedgerow which will include native tree species in the vicinity of the identified cultural heritage receptors.
OMM22	Remedy/offsetting will be provided through the development of an interactive database which will enable members of the local community to record folklore and other intangible cultural heritage of the local area around the Ballynalacken Windfarm Project. This database will be available to the public, for example through the local libraries and online, the data will be checked before being made publicly available, and the database will be demonstrated in the local schools, community centres and with local heritage groups. The windfarm owner will fund the ongoing maintenance of this database.
OMM23	Remedy/offsetting will be provided through the funding of geophysical surveys in the landholding associated with the identified cultural heritage site. The geophysical survey will be carried out under licence from the National Monument Service, and the results of the survey will be shared with NMS.
OMM24	A Community Liaison Officer will be appointed for the duration of the operational phase of the windfarm and will act as a point of contact for the local community.
OMM25	The community benefit fund will be managed in accordance with the *Good Practice Principles Handbook for Community Benefit Funds* (DECC, 2021). The Promoter of the project will initiate engagement with the local community post consent and prior to the commencement of construction works. A committee will be formed to oversee the distribution of the Community Benefit Fund. This committee will include the Promoter, an administrator, the Community Liaison Officer and members of the local community who have volunteered to serve on the Fund Committee.
OMM26	Following the completion of the construction and commissioning of the Project, the Environmental Management Plan will be updated, and the operation of the Ballynalacken Windfarm will be carried out in accordance with the updated Plan. A suitably qualified Environmental Manager will be appointed by the Project Promoter, and it will be their responsibility to ensure that the EMP is implemented through liaising with the Asset Manager and by carrying out regular audits on EMP compliance. The EMP will be an important contract document for the Asset Management contractor who will be contractually obliged to comply with the EMP and the requirements of the Environmental Manager.
OMM27	A viewpoint/picnic area will be provided at Site Entrance No. 7 in Ballynalacken townland, where a car can pull off the road and enjoy the view west over the River Nore valley towards the Slieve Bloom Mountains. This will afford a safe place to enjoy Viewpoint V19 “View west towards the Slieve Bloom Mountains on road no’s LS5840 and LS5839 from the junction with road nos. LS5839 and LS5846 (Ballymartin Cross Roads)” as described in Kilkenny City and County Development Plan 2021 - 2027. The proposed Ballynalacken Windfarm turbines will be behind the viewer and therefore not visible within the Viewpoint V19 viewshed west.

EIAR 19.4 Decommissioning Phase Mitigation Measures & Monitoring Arrangements

The following Environmental Protection Measures will apply during the decommissioning of the Ballynalacken Windfarm:

EIAR 19.4.1 Decommissioning Phase Monitoring & Mitigation Measures

DMM ID	Decommissioning Phase Mitigation Measure (DMM)
DMM01	Prior to the commencement of decommissioning works, these protective measures listed herein, will be reviewed to ensure that the most up-to-date measures are implemented during decommissioning works to comply with best practice at the time.
DMM02	Before any reopening/re-widening of site entrances, haul route works locations or turbine hardstands to accommodate the removal of large turbine components, the works locations will be surveyed for invasive plant species infestations and should any be present within 7m of the works, then the works within 7m of the infestation will be under the direct supervision of an ecologist with prior experience of invasive species.
DMM03	During any reopening/re-widening of site entrances or haul route works locations, the topsoil removed to reveal the hardcore underneath will be stored in an adjacent temporary deposition area, covered to protect it from weathering, and a silt fence will be erected around this deposition area.
DMM04	Continuous silt fencing will be installed down slope of any decommissioning or reinstatement works areas that occur within a 50m zone of a watercourse or wet drainage channel prior to the commencement of the reinstatement works.
DMM05	Weather forecasting warnings will be consulted in advance of works, and decommissioning works will not take place during periods of prolonged heavy rain or exceptional rainfall events.
DMM06	Decommissioning traffic, personnel and materials will be restricted to within the Decommissioning Works Area Boundary fence. Machinery will be kept on the windfarm site roads and hardstanding areas, and, aside from reinstatement works, will avoid moving off the hardstanding areas.
DMM07	Overnight parking of plant and machinery will only be permitted at the turbine locations. There will be no refuelling of vehicles or plant permitted within 100m of a watercourse, wet drainage channel or private well/spring. Any re-fuelling of machinery on site will be carried out using a mobile double skinned fuel bowser which will carry fuel absorbent material and pads in the event of any accidental spillages. In addition, spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.
DMM08	Following the completion of decommissioning, the hardcore areas at the turbines and at widened site entrances and haul route works locations will be covered over, using the soil in the deposition area. The area will be reseeded/replanted as appropriate to the location. And if in agricultural lands, the area will we fenced from livestock until revegetation has occurred. Land reinstatement works will not take place during periods of prolonged heavy rain or exceptional rainfall events or when the soil is waterlogged.
DMM09	The Asset Manager will check the rate of re-vegetation of exposed soils and reinstated areas quarterly for a period of 2 years following decommissioning works. Where revegetation is slower than expected, that area will be prepared and re-seeded or replanted in an appropriate manner.
DMM10	All plant and machinery which will be used during decommissioning works will be fit for purpose and in good working order prior to mobilisation to works areas.

DMM ID	Decommissioning Phase Mitigation Measure (DMM)
DMM11	Plant and machinery will not be permitted to idle. Machinery used intermittently will be shut down or throttled back to a minimum when not in use. The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations. All vehicles and plant will be fitted with effective exhaust silencers. Noise dampeners will be fitted where required.
DMM12	Decommissioning operations shall generally be restricted to between 0700-1800hrs Monday to Friday, and 0700-1400hrs on Saturdays. Site activities which are likely to create high levels of noise or vibration will be limited to these hours of operation. However, to accommodate the transport off-site of large turbine component along public routes it could be necessary on occasion to work outside of these hours.
DMM13	A Community Liaison Officer (CLO) will be appointed and will be the point of contact for local residents for matters relating to decommissioning works, noise and transportation timing.
DMM14	During the decommissioning of the windfarm, the Environmental Management Plan (EMP) will be updated, and the decommissioning works will be carried out in accordance with the updated EMP. A suitably qualified Environmental Manager will be appointed by the Project Promoter, and it will be their responsibility to ensure that the EMP is implemented through liaising with the Asset Manager and the decommissioning Contractor(s) and by carrying out regular audits on EMP compliance. The EMP will be an important contract document for the decommissioning contractor(s) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Manager.
DMM15	The works will be carried out in consultation with Kilkenny County Council and under the supervision of a suitably qualified engineer and hydrologist. Re-vegetation of the site will be carried out under the supervision of a suitably qualified ecologist.

EIAR 19.5 Environmental Management Plan

An Environmental Management Plan (EMP) has been prepared for the Ballynalacken Windfarm Project. The EMP describes the approach to environmental management during the construction, stage of the Ballynalacken Windfarm Project.

The EMP is considered a dynamic document and as such will be reviewed and updated as required throughout each stage of the Ballynalacken Windfarm Project development to ensure it contains the latest relevant information, environmental commitments, mitigation measures and monitoring arrangements.

The purpose of this document is to communicate environmental protection measures that apply to the development of the Ballynalacken Windfarm Project to those with responsibility for carrying out works or activities on site so that significant adverse effects on the receiving environment can be prevented. The EMP will include all of the mitigation measures and monitoring arrangements for the Project, including those proposed as part of the EIA Report and AA Report, along with Traffic, Surface Water, Waste and Biodiversity Management Plans, Emergency Response Procedures, any additional measures, monitoring or procedures included in consent conditions.

An Environmental Clerk of Works will be appointed, independent of the main construction Contractor, and will carry out weekly audits of the construction works and process, reporting to the Project Manager on EMP compliance. If non-compliance is detected, then, prompt corrective action will be agreed and committed to by the Contractor, with a view to the swift and effective resolution of any deviations from the EMP requirements. Furthermore, the Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works at a works location in order to avoid or react to an unforeseen adverse environmental event. Works will not be allowed to re-commence until the issue is resolved.

The EMP will be an important contract document for the main construction contractor (Contractor) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Clerk of Works.

Following the completion of construction, the roles and responsibilities and the environmental commitments included in the EMP will be updated for the operational phase of the Project. Similarly, the EMP will be updated once again prior to decommissioning.

See Ballynalacken Windfarm Project Environmental Management Plan in Volume D which accompanies the planning application.