MWP

Chapter 18 Schedule of Environmental Mitigation

Ballinla Wind Farm

Ballinla Wind Farm Limited

August 2025

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18. Schedule of Mitigation Measures

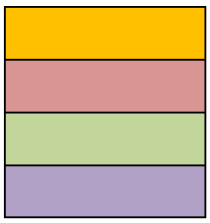
18.1 Introduction

This Schedule of Environmental Mitigation summarises and sets out an implementation for all environmental mitigation measures recommended in the EIAR for the Proposed Development. The full project description is provided in Chapter 2 Description of the Proposed Development.

18.2 Methodology

The schedule on the following pages is structured in accordance with the following project phases:

- Prior to Commencement of Construction.
- During Construction Phase.
- Post Construction/Operational Phase.
- Decommissioning.



The schedule is presented in a Table format which outlines, for each of the project phases:

- The environmental aspect or resource for which mitigation is required.
- The required or proposed mitigation measure to undertake/implemented.
- The persons responsible for implementing the recommenced mitigation.
- The relevant actions, procedures and plans relating to implementation of the mitigation.

Table 18-1: Schedule of Mitigation Measures

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
PRIOR TO CONSTRUCTION	Construction Environmental and Management Plan (CEMP)	A CEMP has been prepared for the project and will be implemented during construction in order to ensure that the project is constructed in accordance with best practice, with the minimum effect on the surrounding environment. The implementation of proposed mitigation measures, environmental commitments of the project, and the monitoring and supervision of these measures will be managed through the CEMP. It includes, but is not limited to, measures to control/manage various elements of the Proposed Development including the following: • Management of Excavations • Surface Water Management and Run-off Control (Sediment and Erosion Control) • Fuels and Oils Management • Management of Concrete • Construction Noise Management • Construction Waste and By Product Management Plan • Wheel Wash Management Procedure • Construction Traffic Management • Construction Dust Management • Construction Noise Management • Archaeological and Heritage Protection • Ecological Management Plan for the Protection of Habitats and Fauna • Management of invasive Species • Management of Material Assets • Landscape and Visual Management • Land and Soil Management • Emergency Response Plan • Site Environmental Training Awareness • Monitoring and Auditing • Environmental Accidents, Incidents and Corrective Actions	Developer Principal Contractor and Responsible personnel identified in the CEMP	Chapter 2 Project Description Appendix 2A CEMP To be communicated to Principal Contractor and incorporated into final CEMP. Chapters 5 to 16 NIS
PRIOR TO CONSTRUCTION	Construction Environmental and Management Plan (CEMP)	The EIAR CEMP will be updated to align with the conditions of the planning permit and any other required licenses. It will then be finalized by the Appointed Contractor in advance of works commencing and submitted to the local authority(s) for approval. Construction method statements will be prepared prior to commencement of construction and incorporated into the CEMP.	Principal Contractor and Responsible personnel identified in the CEMP	Develop Final CEMP and submit to planning authority for comment.

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
PRIOR TO CONSTRUCTION	Traffic Management Plan (TMP)	A final TMP will be prepared by the Principal Contractor. It will take account of the measures specified in the TMP submitted with the planning application, and any measures agreed with the relevant authorities.	Principle Contractor	Develop final TMP and submit to planning authority.
PRIOR TO CONSTRUCTION	Biodiversity Non-volant mammals (Badger and Otter) - Pre-Construction survey	Pre-construction surveys for non-volant mammals, such as badger and otter, will be undertaken prior to the commencement of any construction activity to identify any changes within the site with regard to protected mammals. The pre-construction surveys should be undertaken no more than 10 to 12 months in advance of construction. The surveys are to be supplemented by an additional survey immediately prior to site works commencing. Surveys and implementation of best-practice guidelines for badger and otter will be overseen by the ECoW and in accordance with NRA/TII Guidelines 'Guidelines for the Treatment of otters prior to the Construction of National Road Schemes' (NRA 2008) and 'Guidelines for the Treatment of badgers prior to the Construction of National Road Schemes' (NRA, 2008). Where relevant, mitigation for badger and otter will be carried out in full accordance with NRA/TII Guidelines.	Project Ecologist	Chapter 6 Biodiversity
PRIOR TO CONSTRUCTION	Ornithology Pre-Construction Bird Survey	A re-confirmatory ornithological survey will be undertaken in March or April prior to the commencement of construction to identify any new breeding territories or nesting activity, particularly for species such as snipe and woodcock. Should any active nests be identified, works in those areas will be delayed until the breeding season has concluded or until fledging has been confirmed through monitoring. A 500m buffer will be applied around any confirmed snipe territories, and a 250m buffer will be maintained for woodcock.	Developer Project Manager and/or Appointed Project Contractor	Chapter 7 Ornithology
PRIOR TO CONSTRUCTION	Material Assets Haulage Route Network – Pre-Construction	In consultation with Offaly County Council's Roads Department, vehicle passing bays will be provided along the L5010, prior to the commencement of the proposed site construction, to facilitate two-way vehicle traffic movements. To ensure the integrity of the local road network during the construction phase, a road pavement monitoring programme will be implemented. This will involve pre-construction road and bridge condition on the haul routes on the L5010 and L5006, including photographic and structural assessments, to establish a baseline. Monitoring will continue throughout the construction period, with periodic inspections to identify any deterioration attributable to construction traffic, particularly from HVs. Post-construction surveys will also be carried out, and any damage directly linked to project activities will be repaired in consultation with OCC. The Proposed Grid Connection and Proposed TDR works will require a Road Opening License (ROL) prior to the commencement of works on the public road. The road surface of the public roads will	Appointed Project Contractor	Chapter 15 Material Assets Traffic and Trasport

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		be reinstated to the standards set out by the Department of Transport (DoT) Guidelines on the Opening, Backfilling and Reinstatement of Trenches on Public Roads (April 2017). All road permanent reinstatement works will be in accordance with the requirements of OCC.		
PRIOR TO CONSTRUCTION	Water Quality Pre-Construction Baseline Monitoring	A programme for water monitoring will be prepared to best practice guidance prior to the commencement of the construction of the Proposed Development. The plan will include monitoring of water during the pre-construction, throughout construction and in the immediate post construction phases. Further baseline water quality monitoring of all streams near the Proposed Development will be undertaken prior to construction to confirm existing conditions at the time of construction. This baseline data will include the main components of a full hydrograph for the streams including both high spate flow and base flow where possible.	Developer Project Manager and/or Appointed Project Contractor	Chapter 6 Biodiversity Chapter 8 Water
PRIOR TO CONSTRUCTION	Cultural Heritage	Pre-construction, a geophysical survey and test trenching should be carried out at the locations of each turbine and adjoining working area where soil removal is proposed as well as the location of the Proposed Substation and access road. A licence must be obtained for geophysical survey and archaeological test trenches from the NMS based on an agreed Method Statement well in advance of undertaking the necessary surveys. Much of the lands at the southern side of the Proposed Development may not be suitable for geophysical survey and the scope of archaeological testing may be limited by the terrain and existing forestry. in this case a provision for archaeological monitoring at construction phase is suggested for all ground reduction works/topsoil stripping associated with the proposed windfarm. It is recommended pre-construction and during construction that the Appointed Contractor will make provision for archaeological monitoring to be carried out under licence to the Department of Housing, Local Government and Heritage (DHLGH) and the NMI, and will ensure the full recognition of, and the proper excavation and recording of all archaeological soils features, finds and deposits which may be disturbed in the course of the works. All archaeological issues will be resolved to the satisfaction of the DHLGH and the NMI. The archaeologist should be provided with information on where and when the various elements and ground disturbance will take place.	Project Archaeologist	Chapter 12 Cultural Heritage
DURING CONSTRUCTION	Best Practice	**<u>Environmental Manager/ECoW</u>** A suitable qualified and experienced Project Ecologist/ECoW will be employed during the construction phase of the project. Duties will include the review of all method statements, delivery of toolbox talks, undertaking of all required pre-construction surveys for protected species, clearance works, and monitoring of works throughout the construction phase to ensure all environmental controls and EIAR mitigation is implemented in full. As part of toolbox talks, contractor staff and other site personnel, as relevant, will be made aware of the procedure to follow if a protected species or their resting or breeding site is encountered. The Project Ecologist/ECoW will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted and mitigated for in the EIAR. The project ecologist/ECoW will be responsible for pointing	Developer Principal Contractor	Chapters 6 Biodiversity Appendix 2A CEMP Appoint Project Team

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		out boundaries of exclusion zones.		
DURING CONSTRUCTION	Biodiversity Habitats	**Protection of Habitats** The area of proposed works will be kept to the minimum necessary to minimise disturbance to habitats and flora. The footprint of the development area and construction area will be clearly marked prior to commencement of construction with secure posts and high visibility tape. These areas will be marked out with reference to design drawings, under the supervision of the project engineer and ECoW. There will be no removal of habitat, movement/storage of construction machinery, or any other construction related activities permitted outside the Proposed Development area. **Removal of vegetation (excluding conifer plantation)** In accordance with Section 40 of the Wildlife Acts, vegetation removal, including hedgerow and tree removal, will be conducted outside of the restricted bird nesting period (March 1st to 31st August). The provisions of Section 40 of the Acts do not relate exclusively to birds, but to broader biodiversity, the protection of which will contribute to local food chains and ecosystem functioning. **Forestry Felling** Overall, felling of approximately 21ha of commercial forestry will be required. All tree felling will be undertaken in accordance with the conditions attached to the tree felling licence and in accordance with Forest Service Guidelines. Harvesting is the main of two forest operations that can cause nutrient run-off to water bodies and contribute to their eutrophication unless mitigating measures are taken. The Forestry and Water Quality Guidelines (DMNR, 2000) and Standards for Felling & Reforestation (DAFM, 2019) describe best practice that must be adopted if carrying out felling. A harvesting plan and associated mapping will be prepared and will include a review of the felling areas, environmental receptors – water features (including aquatic zones, relevant watercourses, hotspots, water abstraction points and crossing points), biodiversity (including hedgerows and other habitats), selection of felling and extraction system and machinery, silt and sediment control, timing, and extraction management.	Project Ecologist/ECoW Appointed Contractor	Chapter 6 Biodiversity CEMP Biodiversity Enhancement Plan
DURING CONSTRUCTION	Biodiversity Protection of Fauna	**Badger, Otter and Non-Volant Mammals** A number of badger setts were identified during baseline ecology surveys, at least one of which was confirmed active at the time of surveys. These setts will be retained. None of the identified setts are within 30m or 50m of a proposed turbine location or access track, however; badgers move between setts and can excavate new setts. If any new badger setts are discovered during the pre-construction surveys within or in proximity to the construction corridor, then all works within a 30m buffer (50m buffer during the breeding season) will cease. NPWS will be contacted, and the necessary mitigation implemented further to consultation. No otter holts were identified, and no evidence of otter was found during the baseline ecology surveys.	Project Ecologist/ECoW Appointed Contractor	CEMP Chapter 6 Biodiversity Chapter 7 Ornithology Chapter 8 Water

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	Pre-construction surveys for non-volant mammals, such as badger and otter, will be undertaken prior to the commencement of any construction activity to identify any changes within the site with regard to protected mammals. The pre-construction surveys will be undertaken no more than 10 to 12 months in advance of construction. The surveys will be supplemented by an additional survey immediately prior to site works commencing. Where areas of dense vegetation are to be removed, the Project Ecologist/ECoW will be present to oversee removal of vegetation and ensure any necessary mitigation measures are in place in the event that a previously unknown breeding or resting site of any protected mammal species e.g., badger sett, are encountered during the works. Surveys and implementation of best-practice guidelines for badger and otter will be overseen by the Project Ecologist/ECoW and in accordance with NRA/TII Guidelines 'Guidelines for the Treatment of otters prior to the Construction of National Road Schemes' (NRA 2008) and 'Guidelines for the Treatment of badgers prior to the Construction of National Road Schemes' (NRA, 2008). Where relevant, mitigation for badger and otter will be carried out in full accordance with NRA/TII Guidelines. **Red Squirrel, Pine Marten and Irish Stoat** Where possible, felling of forestry will be limited to periods outside of when red squirrel and pine marten are likely to have young in dreys/dens (peak period January to March for red squirrel, March and April for pine marten). If felling of forestry during these time periods is unavoidable, then the area to be cleared will be surveyed by a suitably qualified ecologist to search for the presence of breeding sites. The general avoidance of removal of vegetation during the bird-nesting period (March to August, inclusive) will avoid disturbance to stoat during their peak breeding season. Where any breeding sites will be disturbed, mitigation will be carried out under approval from NPWS as necessary and in full accordance with NRA/TII Guidelines. **Irish Hare, Hedgehog and Pygmy Shrew** These species are mobile and so are expected to disperse from the area. however, young are vulnerable to impacts during vegetation clearance and/or during periods of hibernation, in the case of hedgehog. Prior to any vegetation clearance, the area to be cleared will be checked by a suitably qualified ecologist to check for the presence of young mammals, or hibernating hedgehog, as appropriate. **Bats** **Turbine Bat Buffer Felling** Using NatureScot (2021) as a guide, the following felling distances were calculated for each of the turbines: T1 = 77 m, T2 = 89 m, T3 = 77 m, T4 = 83 m, T5 = 91 m. A modified buffer will be required around turbines T6 and T7. Within these bat buffers it is noted that the clearance of vegetation		

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	within a buffer zone to reduce risk to bat populations, can have the potential to create an ecological rich foraging area for bats in the immediate time post-clear felling and the extent of this increased activity depends on the size of the area cleared and the bat species in question. Therefore, it is recommended that a minimum of 6 to 12 months should lapse after clear felling before the installation of turbines, and that all vegetation should be cleared from these buffer zones. It should also be noted that any existing hedgerow found within these buffer areas will be intensively managed to ensure the height is kept as low as possible (1m to 1.5m) whilst still retaining their function as field boundaries for livestock. **Lighting** Any proposed lighting shall adhere to the following guidelines, taken from the Bat Conservation Trust 2023 'Guidance Note 08/23', to ensure that any unnecessary light spill from the Proposed Development and its potential impacts to any roosting, foraging and commuting bats are minimized. • LED luminaires are to be used due to the fact that they are highly directional, and have a sharp cut-off, lower intensity, good colour rendition, and dimming capability. • All luminaires should lack UV elements to reduce impact. Metal halide and compact fluorescent sources should not be used. • A warm white light source (<2700 Kelvins) is to be adopted to reduce the blue light component). • Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. • Internal luminaires can be recessed (as opposed to using a pendant fitting) where they are installed in proximity to windows to reduce glare and light spill. • Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges. • Column heights will be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards. The shortest column height allowed will be used where possible. • Only luminaires with a negligible or zero upward light ratio and good optical control will be used. • Luminaires should always be mounted horizontally with no light output above 90° and/or no upward tilt. • Where appropriate, external security lighting should be set on motion sensors and set to as short a possible timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate. • Use of a Central Management System (CMS) with additional web-enabled devices to light on demand. • Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS.		

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output and increased upward light scatter from surfaces. Therefore, they should only be considered in specific cases where these issues can be resolved. • Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the mitigating effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.		
DURING CONSTRUCTION	Biodiversity/water Water Quality and quantity	**Water Monitoring** A programme for water monitoring will be prepared to provide best practice guidance prior to the commencement of the construction of the Proposed Development. The plan will include monitoring of water during the pre-construction, throughout construction and in the immediate post-construction phases. Surface water monitoring to include Turbidity, pH/EC and colour will be undertaken daily upstream and downstream of the works areas and where required, at the outlets from settlement ponds. Where water from the settlement ponds fails to meet the required standards, the water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock or similar valve will be provided on the outlet from the sediment pond to control discharge from the site. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified. Surface water samples will also be analysed for the following parameters to ensure compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012): • ammoniacal nitrogen, total suspended solids (TSS), total petroleum hydrocarbons (TPH) and heavy metals. Where required, daily monitoring will also be undertaken upstream and downstream at the outlets from settlement ponds. Where water from the settlement ponds fails to meet the required standards, the water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock or similar valve will be provided on the outlet from the sediment pond to control discharge from the site. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified.	Project Ecologist/ECoW Appointed Contractor	Chapter 6 Biodiversity Chapter 8 Water CEMP

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	Inspection records and summary reports from site supervision by the ECoW will be made available to OCC upon request. Should any deviation from the proposed mitigation be noted, this will be reported to OCC and corrective measures will be agreed. Discharges to surface water/foul sewers will be monitored where required in accordance with statutory consents (i.e., discharge licence). Routine monitoring and inspections will be undertaken by the main contractor or appointed delegate during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures. **Water Quality** The main potential for impacts is during the construction phase. Silt laden runoff and pollution by accidental concrete/fuel/oil spill will comprise the main sources of potential water quality impacts during the construction stage. • Silt ponds will be adopted at access tracks and swales as a key mitigation measure to minimise surface water runoff and trap sediment before it reaches watercourses. Design of these features will be in accordance with best practice, oversized and retained post construction. • During the construction phase of the project, water quality in the streams and outflow from the drainage and attenuation system will be monitored, field-tested and laboratory tested on a regular basis during different weather conditions. This monitoring together with the visual monitoring will help to ensure that the mitigation measures that are in place to protect water quality are working effectively. • During the construction phase of the project, the development areas will be monitored regularly for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system to ensure it does not become blocked, eroded, or damaged during the construction process. • Prior to any construction activity being carried out, the subject part(s) of the Proposed Development site will be inspected for areas that may be prone to siltation of nearby rivers/streams and drains as appropriate. Where necessary, check dams, sand-bags and/or silt fences will be installed in adjacent trackside drainage ditches to ensure an optimum standard of water running into adjacent streams from the trackside drainage. During periods of heavy precipitation and runoff, works will be halted if posing a risk to the water environment or working surfaces/pads will be provided to minimise soil disturbance. Any requirement for temporary fills or stockpiles will be covered with polyethylene sheeting of suitable grade/gauge to avoid sediment release during periods of heavy rainfall. Additional infrastructure and measures used to control water quality will include:		

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	• Settling out as far as reasonably practicable any silty water generated on site through drainage mitigation measures (silt traps, etc.) and channelled into suitable vegetation (as defined by ECoW) at least 50m from watercourses. • Establishing vegetation on exposed areas by using top sod or reseeding with a suitable seed mix. • Regular road cleaning. • Use of wheel washes. • Use of check dams on drains to slow water velocity. • Use of silt fences on drains to reduce sediment loading. • Daily and weekly weather forecast monitoring. • Programme of daily, weekly, and monthly water quality monitoring. All design and works in proximity to watercourses will follow the best practice guidance outlined in the following documents: • Draft Revised Wind Energy Development Guidelines (DHPLG, 2019). • 'Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters' (IFI, 2016). • 'Control of water pollution from linear construction projects' (Murnane et al. 2006). • 'Guidelines for the crossing of Watercourses during Construction of National Road Schemes'(NRA, 2008). **Dewatering** All ground water/surface water that may enter turbine foundations or cable trenches/joint bays will be removed and treated and disposed of appropriately, in accordance with best practice. Any dewatering (if/where required) will adhere to the following measures: • Ground water/surface water will not be pumped directly into trackside drains/watercourses. • Ground water/surface water which has become silted within the turbine foundations will be pumped to the surface water drainage system to settle out. • Ground water/surface water which has become silted within the trenches/joint bays will be pumped and allowed to infiltrate into a designated percolation area (area designated by the ECoW). Dedicated settlement ponds will be provided adjacent to the site tracks, proposed borrow pit location, hard stands, substation. The design and locations of the ponds are outlined in Chapter 3: Civil Engineering. Where necessary, sediment ponds will be partly filled with stone so that they will not present a long-term safety risk. The remaining ponds will be left to fill in and re-vegetate naturally or retained as ponds. • There will be no unauthorised discharge of water to ground during the Construction Phase. • Where water must be pumped from the excavations, water will be discharged by the contractor, following appropriate treatment (e.g., settlement or hydrocarbon interceptor) to sewer in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to		

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	sewer or from OCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water. • Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released offsite. Where required, all existing drainage channels and public sewers will be protected to ensure that any untreated wastewater generated onsite does not enter the public sewers. Drainage channels will be clearly identified on site and shown on method statements and site plans. **Cement Bound Granular Mixtures (CBGM)** For the cable trench construction, temporary storage of CBGM will be on hardstand areas, or areas that are not prone to run off. These areas will be located where there is no direct drainage to surface waters and where the area has been appropriately bunded. Bunding will be in the form of sandbags, geotextile sheeting, or silt fencing. This method will prevent any solid run-off. Concrete truck chutes will be washed out at a dedicated, bunded area. **Fuel Management** All plant equipment will be refuelled on site e.g. excavators, dumpers etc, while rigid and articulated vehicles will be fuelled off site as will all site vehicles (jeeps, cars and vans). At construction stage, a Fuel Management Plan will be developed specific to the site and the particular plant and equipment required for construction. The plan outlined will have regard to the following elements: • Mobile bowsers, tanks and drums will be stored in a secure, impermeable storage area, away from drains and open water. • Fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores. • Ancillary equipment such as hoses, pipes will be contained within the bund. • Taps, nozzles or valves will be fitted with a lock system. • Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage. • Only designated trained operators will be authorised to refuel plant on site. • Procedures and contingency plans will be set up to deal with emergency accidents or spills. • An emergency spill kit with oil boom and absorbers will be kept on site in the event of an accidental spill. A detailed fuel and oil management plan can be found in the CEMP. **Refuelling of Construction Plant Onsite** The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of the use of hydrocarbons: • Refuelling will be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using.		

Time Frame/Schedule	Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
	• Mobile bowsers, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water. • To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up-to-date service record will be required from the main contractor. • Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits. the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility. • Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery. • In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery. **Construction Wheel Wash** • A construction wheel wash will be used for vehicle wheels and undersides entering and leaving the construction site. • Water residue from the wheel washing will be fed through a settlement pond for settling out of suspended solids. • The wheel wash area will be cleaned regularly so as to avoid the buildup of residue. • While these measures pertain to hydrology, and are included in the CEMP, they also relate to aquatic biodiversity, so are included here. **Temporary Construction Compound** The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of the erection of the temporary compound: • Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillage occur. • A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc. • The compound will be in place for the duration of the construction phase and will be removed once commissioning is complete. **Storage** The storage of materials, containers, stockpiles, and waste, however temporary, will follow best practice at all times and be stored at designated areas. Storage will be located as follows: • Away from drains and sensitive habitats (IEFs). • On an impermeable base. • Under cover to prevent damage from the elements.		

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• In secure areas. • Well away from moving plant, machinery and vehicles. All containers will be stored upright and clearly labelled. Sufficient storage will be supplied near all working areas. **Excavation Works** Excavation works relate mainly to trench digging and excavations. Mitigation in soil management as outlined in **Chapter 9:** Land and Soil will also apply. The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of excavation works: • Earth movement activities will be suspended during periods of prolonged rainfall events. • The earthworks material will be placed and compacted in layers to prevent water ingress and degradation of the material. • Drainage and associated pollution control measures will be implemented on site before the main body of construction activity commences. **Excavated Materials and Soil Management** All soils generated from excavation works within the wind farm associated with turbines, access track, substation, grid connection and internal cable construction will be retained on site and reused in bunding, landscaping and restoration of the deposition area. No soils will be removed from the site. Permanent stockpiling of soils will not take place. During excavations in the existing tracks, excavated material will be temporarily stockpiled adjacent to the section of trench, with appropriate material used as backfill. Appropriate siltation measures will be put in place prior to excavations. Stockpiles will be stored a minimum of 50m back from rivers/streams on level ground with a silt barrier installed at the base.		
DURING CONSTRUCTION	Disturbance avoidance Ornithology Surveys	To avoid disturbance to nesting birds, vegetation clearance, including removal of scrub and trimming of trees, will be undertaken outside the bird breeding season (March 1st to August 31st inclusive), subject to other environmental constraints such as runoff control. Where clearance is required during this period, a suitably qualified ecologist will carry out pre-clearance surveys to identify any active nests. If nesting birds are present, appropriate mitigation will be implemented, including the establishment of species-specific buffer zones and/or seasonal constraints based on the known breeding cycles of the species involved. For example, a minimum buffer of 10 metres will be applied around active small passerine nests, while raptor species such as kestrel, peregrine, or merlin will require a 500m buffer. Lower sensitivity raptors such as sparrowhawk and buzzard will be afforded a 200m buffer, and woodcock nests (if identified) will be protected by a 250m exclusion zone. A re-confirmatory ornithological survey for wintering birds will also be undertaken during the winter months. In the event that grazing whooper swans are recorded within 600m of the Proposed Development prior to construction, targeted monitoring will be undertaken to assess potential	Project Ecologist/ECoW Appointed Contractor	Chapter 7 Ornithology CEMP

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		disturbance or displacement. If significant disturbance is observed, or if regular use of the area by wintering swans is confirmed, a 600m exclusion zone will be implemented until the birds have departed in spring. Similar monitoring and exclusion protocols will be applied for lapwing (both breeding and non-breeding seasons) and golden plover (non-breeding season), based on their observed use of the site and surrounding habitats. Where possible, works in the vicinity of areas (shown on Figure 7-4 of the Ornithology chapter) which could potentially be used by roosting hen harrier on a casual basis during winter will avoided/minimised during the winter season. If works are required in these areas during winter, the ECoW will undertake roost watches to check for hen harrier activity and if required, working hours in the vicinity of these areas shall be restricted to avoid night, dawn and late afternoon/dusk. Construction activities will generally be restricted to daylight hours to minimise disturbance to roosting and nocturnal bird species. Where night-time works are unavoidable, such as during concrete pours or turbine erection, these will be supervised by the project ecologist or ECoW. All construction personnel will receive toolbox talks on ornithological sensitivities and the importance of adhering to mitigation protocols. Finally, turbine lighting will be designed to minimise attraction of nocturnal migrants and insects. White lights will not be used. Where required by the Irish Aviation Authority, turbines will be fitted with medium-intensity fixed red obstacle lights (2000 candelas), equipped with baffles to direct light skyward and reduce ground-level visibility.		

DURING CONSTRUCTION	In-Stream Works	Where instream works are required for the construction of watercourse crossings and culverts, the following mitigation measures will be implemented to protect water quality and maintain the integrity of the receiving waterbodies:
		• All instream and near-stream works will be carried out in accordance with:
		  ○ Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016).
		  ○ Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (2008).
		  ○ CIRIA C648 – Control of Water Pollution from Linear Construction Projects (2006).
		• No instream works will be carried out outside the permitted IFI window of July 1st to September 30th, to protect aquatic habitats and fish spawning periods.
		• A qualified Environmental Clerk of Works (ECoW) will be present onsite during all instream works (e.g., bridge and culvert installations) to oversee environmental protection measures and ensure compliance with best practice.
		• The ECoW will conduct regular water quality monitoring upstream and downstream of the works area to detect any changes and initiate corrective actions if necessary.
		• Silt fences and sediment control measures will be installed as required to prevent sediment from entering watercourses.
			Appointed Contractor	Chapter 8 Water

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Prior to construction, defined works areas will be fenced off at each crossing location. Silt fences will be attached to these fences to create a barrier between the works and adjacent watercourses (e.g., the Leitrim stream and its tributaries). • Silt fences will be constructed using geotextile membranes that allow water to pass through while retaining sediment. • Heras fencing will be installed in front of the silt fences to prevent "site creep" — the gradual encroachment of construction activities toward sensitive areas. • Precast concrete culverts will be used to minimise in-stream construction time and reduce the risk of pollution. • Existing vegetation will be preserved where possible, and disturbed areas will be promptly replanted to stabilise soils and reduce erosion. • All river protection measures (e.g., silt fences, settlement ponds) will be maintained in effective condition throughout the works and inspected regularly. • Daily monitoring of silt fences and settlement ponds will be carried out by the contractor or ECoW, particularly during sensitive phases such as site clearance, concrete pours, and after heavy rainfall events. • Maintenance of sediment control infrastructure will be undertaken as needed to ensure continued effectiveness. • Monitoring frequency will be adjusted based on the stage of works and environmental conditions, with increased checks during high-risk activities or adverse weather.		

DURING CONSTRUCTION	Flow Alterations	• Implement a site-specific surface water management system based on SuDS principles incorporating features such as:
		  ○ Swales, filter drains, and attenuation basins to manage runoff volumes and rates.
		  ○ Check dams and level spreaders to reduce flow velocity and promote infiltration.
		  ○ Settlement ponds or silt traps to capture suspended solids before discharge.
		• All watercourse crossings (e.g. for access tracks or cable routes) will be designed in accordance with OPW Section 50 requirements, ensuring that culverts or bridges are appropriately sized to accommodate the 1-in-100-year flood event plus climate change allowance.
		• Crossings will be constructed using methods that maintain flow continuity and minimise in-stream works.
		• Drainage infrastructure will be designed to replicate pre-development greenfield runoff rates and avoid increasing flood risk downstream.
		• Maintain existing drainage patterns where possible; reinstate any disturbed field drains or watercourses post-construction.
		• Use shallow recharge wells where dewatering is required to maintain local groundwater levels.
		• All dewatering will be managed in accordance with best practice standards (i.e., CIRIA C750).
			Appointed Contractor	Chapter 8 Water
				CEMP

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• The dewatering methodology to be implemented by the Appointed Contractor will ensure that any dewatering is confined to the localised zone and does not extend towards the site boundaries. • Seal and backfill cable trenches to prevent preferential flow paths. • Monitor groundwater levels during construction and adjust dewatering practices accordingly.		
DURING CONSTRUCTION	Sedimentation	• No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works. • Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards). • There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse. • Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the buffer zone boundary. • Where works are necessary inside the 20m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. • Drainage channels and streams will be clearly identified onsite and shown on method statements and site plans. • During the construction activities there will be a requirement for diverting rainwater away from the construction areas, into nearby drainage channels and streams. • Visual inspections of roads and wheel washing at site entry/exit points will be undertaken to prevent the accumulation of dirt. • Excavations will only remain open for limited time periods to reduce groundwater and surface water ingress and water containing silt will be passed through a settlement pond prior to discharge. • Dewatering, where required, will incorporate the use of filter media. There will be no direct discharges into the watercourses. • Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and retained drainage channels, away from areas subject to flooding. • To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff. • Where required, silt fences will be erected at the toe of stockpiles to prevent runoff. The silt fences will be monitored daily by the Appointed Contractor and silt will be removed as required.		

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Runoff from spoil heaps will be prevented from entering watercourses by diverting it through onsite settlement ponds and removing material as soon as possible to designated storage areas. • Silt traps will be placed across the works boundary in any areas adjacent to watercourses to avoid siltation of watercourses. These will be maintained and cleaned regularly throughout the construction phase. • Use biodegradable erosion control matting on exposed slopes. • Phase vegetation clearance and re-seed disturbed areas promptly. • Monitor and maintain sediment control measures daily, especially after rainfall events.		
DURING CONSTRUCTION	Accidental Spills and Leaks	• The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing. • The main contractor will prepare method statements for weather and flood forecasting and continuous monitoring of water levels in the Leitrim stream and its tributaries. These will be made available to the local authority where requested. The main contractor will also provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones in order to minimise the risk to persons working on the site as well as potential input of sediment or construction materials into the waterbodies during flood events. • No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works. • Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards). • Wastewater from the construction welfare facilities will be managed by means of a sealed storage tank. All wastewaters will be removed from site by permitted waste collector to wastewater treatment plants. • There will be no tracking of machinery within watercourses. • There will be no storage of material/equipment or overnight parking of machinery inside the 15m buffer zone to the watercourse. • Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary. • Designate a bunded storage area at the contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater. • Chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. All chemicals will be stored in designated bunded areas at least 15m away from watercourses.	Appointed Contractor	Chapter 8 Water

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit. • All plant and equipment utilised onsite will be maintained is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development. Only emergency breakdown maintenance will be carried out onsite. • Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite. • Drip trays will be located under all static plant. • Hoses and valves will be checked regularly for signs of wear and will be turned off and securely locked when not in use. • Diesel pumps and similar equipment will be checked regularly, and any accumulated oil removed for appropriate disposal. • Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. • There will be no refuelling allowed within 15m of the watercourses. • Where mobile fuel bowsers are used on the site, in the event of a machine requiring refuelling outside of the designated impermeable area, fuel will be transported in a mobile double skinned tank. • Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles. • In the event of an accidental spillage, or water pollution incident, the site manager or designate shall notify the Local Authority as soon as possible.		
DURING CONSTRUCTION	Use of Cementitious Materials	• No work will take place within the 20m buffer zones of EPA mapped watercourses, except for drainage/stream crossings, associated track construction and minor works. • Site traffic will only be permitted within this buffer to access watercourse crossings or to facilitate instream and near-stream works (near-stream works on EPA watercourses will include some forestry felling carried out to forestry felling 10m buffer standards). • Ready-mixed concrete will be brought to the site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water (for example storm water) to the underlying subsoil and groundwater. • The pouring of concrete will take place within a designated area protected (for example by a geosynthetic material) to prevent concrete runoff into the soil/groundwater media.	Appointed Contractor	Chapter 8 Water

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Any use of concrete in proximity to watercourses will be carefully controlled to avoid spillage. No onsite batching should occur. Washout from mixing will be carried out only in a designated contained impermeable area. • Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to ground or surface waters will be strictly prohibited. Alternatively, where washout takes place onsite, it will be carried out in a designated, carefully managed onsite washout area. • Wastewater from washing of concrete lorry chutes will be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area much be clearly marked and must be located away from storm drain inlets, open drainage facilities, water courses and ditches.		
DURING CONSTRUCTION	Wastewater Management	• All foul water from temporary welfare facilities will be collected in sealed holding tanks and regularly removed offsite by a licensed contractor to a permitted wastewater treatment facility. • No unauthorised discharge of water to ground or surface water will occur during the construction phase. All discharges will be subject to the appropriate consents under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from OCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water. • Where water must be pumped from excavations, it will be treated (e.g., via settlement or hydrocarbon interceptors) before discharge and only in accordance with the relevant discharge licence. • All existing drainage channels and public sewers will be clearly identified, protected, and shown on site plans and method statements to prevent accidental discharge of untreated water. • Under no circumstances will untreated wastewater from equipment washing, road sweeping, or other construction activities be released offsite.	Appointed Contractor	Chapter 8 Water
DURING CONSTRUCTION	Flood Risk	• Develop and implement a Flood Risk Management Plan tailored to the site. • Avoid storing materials, fuels, or machinery in flood-prone areas. • Install temporary bunds, berms, or barriers to divert floodwaters from sensitive zones. • Store hazardous substances above predicted flood levels and in secure, weather-resistant containers. • Use permeable surfaces to reduce surface water flow. • Regularly inspect and maintain site drainage systems. • Monitor water levels during high-risk periods. • Conduct pre and post flood inspections and adapt mitigation measures based on weather forecasts and site conditions.	Appointed Contractor	Chapter 8 Water

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
DURING CONSTRUCTION	Soil Erosion	• Areas of exposed soil will be minimised by phasing construction and reinstating disturbed areas as early as possible. • Unnecessary stripping of topsoil and subsoil will be avoided by optimising the layout and reusing existing access tracks. • Stockpiles of stripped topsoil will be in locations with minimum trafficking to prevent damage and dusting. • Exposed soil surfaces will be stabilised using biodegradable geotextiles, mulch, or hydroseeding, particularly on slopes and embankments. • Temporary soil stockpiles will be shaped and compacted to reduce erosion and will be located in sheltered areas away from construction traffic. • Access tracks and hardstands will be constructed using clean stone and geotextile membranes to prevent soil disturbance and erosion. • Brash mats or bog mats will be deployed on soft ground to protect soil structure and prevent rutting and surface erosion. • Heavy machinery will be restricted to designated haul routes and will not traffic over stripped or stockpiled soils. • Buffer zones will be maintained between soil storage areas and steep slopes to prevent slippage or downslope erosion. • All exposed soil areas will be inspected regularly for signs of erosion, and corrective actions will be implemented immediately. • An Environmental Clerk of Works (ECoW) will be appointed to oversee soil protection measures and ensure compliance with the CEMP. • Stripped topsoil and subsoil will be reused in landscaping and reinstatement works as soon as practicable to reduce exposure time. • The duration and intensity of construction traffic in sensitive areas will be limited to avoid over-compaction of subsoil layers. • A log of soil management activities, inspections, and remedial actions will be maintained throughout the construction phase.	Appointed Contractor	Chapter 9 Land and Soils
DURING CONSTRUCTION	Soil Compaction	• Works will be carried out in accordance with the TMP (Appendix 15) to manage and control vehicular movement on site. Measures will include the scheduling of HGVs during the construction phase to reduce the number of vehicle movements in, through and offsite. • Earthworks haulage will be along predetermined routes within the Development and any deliveries to site will be along existing national, regional, and local routes for importation and exportation of materials. • Haulage with the Proposed Development will be along internal haul roads/access tracks, where practicable.	Appointed Contractor	Chapter 9 Land and Soils

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Heavy vehicles will only follow designated and newly constructed access tracks and avoid loading areas which are not contained within the footprint of the main works to minimise disturbance of the original soil and subsoil formations and to retain soil structure. • Machinery will not operate directly on excavated/stockpiled soils. • Within and around excavations, pore water pressure will be kept low by avoiding loading the soil/subsoil and giving careful attention to the existing drainage. • Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practicable, compaction of any soil or subsoil which is to remain in-situ along the site will be avoided.		
DURING CONSTRUCTION	Soil Stability	• All temporary cuts and excavations will be designed and executed to ensure long-term stability or will be adequately supported using engineered solutions. • Temporary works will be planned and implemented to avoid interference with existing drainage channels and natural flow regimes. • A suitably qualified and experienced geotechnical or civil engineer will supervise all site excavations and construction activities. • The contractor's method statements for each element of work will be reviewed and approved by the supervising engineer prior to commencement. • Surface water interception drains will be installed upslope of all excavation areas prior to earthworks to prevent overland flow from entering exposed soil zones. • A site-specific emergency response plan will be developed to address slope instability risks, particularly during the early excavation phase. • The emergency response plan will include a rainfall-triggered alert system based on 24-hour advance meteorological forecasting (e.g. Met Éireann data). • Construction activities will be suspended when rainfall exceeds a pre-defined threshold (e.g. >25 mm/hr or a 1-in-100-year storm event) and will only resume once conditions have stabilised and runoff has subsided. • All plant, materials, and equipment will be stored in designated, level areas such as the temporary site compound and will not be placed on or near existing or newly formed slopes. • Construction traffic will be routed to avoid surcharging or destabilising slopes, and no loading will occur near excavation edges or embankments. • Where necessary, temporary slope reinforcement (e.g. geogrids, soil nails, or retaining structures) will be installed to maintain slope integrity. • All excavations will be monitored for signs of instability (e.g. cracking, slumping, or water ingress), and corrective actions will be implemented immediately if required. • A geotechnical risk register will be maintained throughout the construction phase, documenting inspections, rainfall events, and any slope-related incidents or interventions.	Appointed Contractor	Chapter 9 Land and Soils

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
DURING CONSTRUCTION	Land and Soils Accidental Spill & Contamination/Pollution	• The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the main contractor in advance of any works commencing. • Designate a bunded storage area at the contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area or 25% of the total capacity of all the tanks within the bund, whichever is the greater. • Chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. All chemicals will be stored in designated bunded areas at least 15m away from watercourses. • Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the site plot, a suitably sized spill pallet will be used for containing any spillages during transit. • All plant and equipment utilised onsite will be maintained is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development. Only emergency breakdown maintenance will be carried out onsite. • Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite. • Drip trays will be located under all static plant. • Hoses and valves will be checked regularly for signs of wear and will be turned off and securely locked when not in use. • Diesel pumps and similar equipment will be checked regularly, and any accumulated oil removed for appropriate disposal. • Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. • Where mobile fuel bowsers are used on the site, in the event of a machine requiring refuelling outside of the designated impermeable area, fuel will be transported in a mobile double skinned tank. • Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and/or booms) shall be held onsite to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles. • Ready-mixed concrete will be brought to the site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water (for example storm water) to the underlying subsoil and groundwater. • The pouring of concrete will take place within a designated area protected (for example by a geosynthetic material) to prevent concrete runoff into the soil/groundwater media.	Appointed Contractor Site Environmental Manager	Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 8 Water and Chapter 15 Material Assets CEMP

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Any use of concrete in proximity to watercourses will be carefully controlled to avoid spillage. No onsite batching should occur. Washout from mixing will be carried out only in a designated contained impermeable area. • Wash down and washout of concrete transporting vehicles will take place at an appropriate designated area and direct discharge of wash water to ground or surface waters will be strictly prohibited. Alternatively, where washout takes place onsite, it will be carried out in a designated, carefully managed onsite washout area. • Wastewater from washing of concrete lorry chutes will be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area much be clearly marked and must be located away from storm drain inlets, open drainage facilities, water courses and ditches. • Access tracks will be cleaned regularly during wet weather to prevent sediment build-up and runoff. • The drainage and treatment system will be regularly inspected and maintained by assigned personnel, especially after heavy rainfall, to ensure it functions properly and prevents leaks or failures during construction. • In the event of an accidental spillage or pollution incident, the site manager or designate shall notify the Local Authority as soon as possible.		
DURING CONSTRUCTION	Land and Soils Tree Felling	• Topsoil removed from felled areas will be reused in landscaping or placed in designated deposition areas. • Vegetative layers will be stored right-side-up where possible to promote natural regrowth. • Felling areas will be monitored and maintained post-construction and into the operational phase. • Runoff from clear-felled areas will be managed using berms, silt traps, and settlement ponds to separate clean and dirty water. • Discharge rates from drainage systems will be controlled to match pre-construction conditions using engineered settlement ponds. • Brash mats will be used on soft ground to reduce soil erosion and prevent rutting; mats will be renewed when worn. • Brash mats will also be provided along off-track routes where practicable to minimise soil compaction. • All felling and reforestation works will comply with the Department of Agriculture, Food and the Marine's forestry standards (2019) and Forest Service licence conditions. • Felling activities at the end of the forestry cycle will follow felling licence requirements and associated environmental mitigation measures.	Appointed Contractor	Chapter 9 Land and Soils

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
DURING CONSTRUCTION	Construction Noise	Notwithstanding the noise impacts being assessed as not significant, the following best practice measures will be implemented during construction of the Proposed Development: • Fixed and semi-fixed ancillary plant such as generators, compressors etc. to be positioned to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures to be provided for specific items of fixed plant. • All plant used onsite will comply with the EC Directive on Noise Emissions for Outdoor Equipment (2000/14/EC), where applicable. • Operation of plant in accordance with the manufacturer's instructions. • All major compressors to be 'sound reduced' models fitted with properly lined and sealed acoustic covers which are kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers. • All plant used onsite will be regularly maintained. • Machines in intermittent use to be shut down in the intervening periods between work or throttled down to a minimum. • Drop heights of materials from lorries and other plant will be kept to a minimum. • Adherence to the codes of practice for construction working given in BS 5228-1: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and the guidance given therein for minimising noise emissions from the site. • Adherence to the codes of practice for construction working given in Noise and BS 5228-2: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration and the guidance given therein for minimising vibration emissions from the site. • Compliance with normal construction working hours of 07:00 to 19:00 Monday to Friday, 08:00 to 14:00 on Saturdays. This excludes public holidays, emergency work provisions and other working periods which would be agreed in writing with the Planning Authority. • Periodically check that mitigation measures are being implemented and are fit for purpose during the works with corrective action mechanisms in place. • Local residents will be kept informed and provision of a contact name and number for any queries or complaints. • All complaints of an environmental nature related to the operation of the activity will be recorded. Each such record shall give details of the date and time of the complaint, the name of the complainant (if provided), and give details of the nature of the complaint. A record shall also be kept of the response made in the case of each complaint. •	Appointed Contractor Site Environmental Manager	Chapter 10 Noise and Vibration CEMP
DURING CONSTRUCTION	Construction Vibration	Notwithstanding the vibration impacts being assessed as not significant, the following best practice measures will be implemented during construction of the Proposed Development: • A clear communication programme will be established to inform closest building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars.	Appointed Contractor Site Environmental Manager	Chapter 10 Noise and Vibration CEMP

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Alternative less intensive working methods and/or plant items shall be employed, where feasible. • Appropriate vibration isolation shall be applied to plant, where feasible.		
DURING CONSTRUCTION	Cultural Heritage General	• Pre-construction, a geophysical survey and test trenching should be carried out at the locations of each turbine and adjoining working area where soil removal is proposed as well as the location of the Proposed Substation and access road. A licence must be obtained for geophysical survey and archaeological test trenches from the NMS based on an agreed Method Statement well in advance of undertaking the necessary surveys. Much of the lands at the southern side of the Proposed Development may not be suitable for geophysical survey and the scope of archaeological testing may be limited by the terrain and existing forestry. in this case a provision for archaeological monitoring at construction phase is suggested for all ground reduction works/topsoil stripping associated with the proposed windfarm. • It is recommended pre-construction and during construction that the Appointed Contractor will make provision for archaeological monitoring to be carried out under licence to the Department of Housing, Local Government and Heritage (DHLGH) and the NMI, and will ensure the full recognition of, and the proper excavation and recording of all archaeological soils features, finds and deposits which may be disturbed in the course of the works. All archaeological issues will be resolved to the satisfaction of the DHLGH and the NMI. The archaeologist should be provided with information on where and when the various elements and ground disturbance will take place.	Appointed Contractor	Chapter 12 Cultural Heritage CEMP
DURING CONSTRUCTION	Air and Climate Dust Generation	• The use of water as a dust suppressant, e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise. • Public roads will be inspected regularly for cleanliness and cleaned as necessary. • All loads entering and leaving the site will be covered during dry periods if dust results in a disturbance on site. • Control of vehicle speeds passing over access tracks and crane hardstanding areas within the site. • Wheel wash facilities will be implemented at the site entrance from the public road to facilitate removal of any material collected by vehicles entering or leaving the site and preventing its deposition on public roads. • Site stockpiling of materials will be designed and laid out to minimise exposure to wind. • Daily site inspections will take place to examine dust measures and their effectiveness.	Appointed Contractor Site Environmental Manager	Chapter 13 Air and Climate
DURING CONSTRUCTION	Air and Climate Construction Traffic Emissions	• Ensure regular maintenance of plant and equipment. Carry out periodic technical inspection of vehicles to ensure they perform most efficiently. • Implementation of the Traffic Management Plan (Volume III, Appendix 15) to minimise congestion. • All site vehicles and machinery will be switched off when not in use, and no idling of engines will be permitted.	Appointed Contractor Site Environmental Manager	Chapter 13 Air and Climate

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
DURING CONSTRUCTION	Material Assets Transport Infrastructure	• All traffic management and road signage will be in accordance with the Department of Transport (DoT) Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Signs for Road Works. in agreement with Laois County Council and OCC. • In consultation with OCC's Roads Department, vehicle passing bays will be provided along the L5010, prior to the commencement of the proposed site construction, to facilitate two-way vehicle traffic movements. • To ensure the integrity of the local road network during the construction phase, a road pavement monitoring programme will be implemented. This will involve pre-construction road and bridge condition on the haul routes on the L5010 and L5006, including photographic and structural assessments, to establish a baseline. Monitoring will continue throughout the construction period, with periodic inspections to identify any deterioration attributable to construction traffic, particularly from HVs. Post-construction surveys will also be carried out, and any damage directly linked to project activities will be repaired in consultation with OCC. • A Traffic Management Plan (TMP) outlining the required traffic management procedures to be implemented on the public roads during the construction of the Proposed Development is included as Appendix 3 in EIAR Volume 3. The TMP will be updated, as appropriate, following the Proposed Development detailed design/tendering stage, and submitted for the approval of Offaly County Council, prior to construction. • The Proposed Grid Connection and Proposed TDR works will require a Road Opening License (ROL) prior to the commencement of works on the public road. The road surface of the public roads will be reinstated to the standards set out by the Department of Transport (DoT) Guidelines on the Opening, Backfilling and Reinstatement of Trenches on Public Roads (April 2017). All road permanent reinstatement works will be in accordance with the requirements of OCC. • No construction delivery vehicles would access the site via the northern section of the L5006 and its Trimblestown Bridge on the Grand Canal. • A construction wheel wash facility will be provided at the construction compound to wash truck tyres leaving the construction site.	Site Environmental Manager	Chapter 15 Material Assets Traffic and Transport
DURING CONSTRUCTION	Material Assets Grid Capacity and Electrical Infrastructure	• The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with ESB Networks. • All works in the vicinity of ESB Networks infrastructure will be carried out in ongoing consultation with ESB networks and will be in compliance with any requirements or guidelines they may have including procedures to ensure safe working practices are implemented when working near live overhead/underground electrical lines	Site Environmental Manager	Chapter 15 Material Assets
DURING CONSTRUCTION	Material Assets Aviation	Whilst the proposed project will not impede aircraft, IAA Electronic Air Navigation Obstacle Data sets has identified obstacles as objects whose height above ground level is 90m or higher, affecting air navigation. Irish Wind Energy Association (IWEA) Guidelines have set out the following measures to ensure that pilots of aircraft are fully aware of the presence of wind turbines.	Site Environmental Manager	Chapter 15 Material Assets

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• All turbines and meteorological masts having a height of 90m, or more are promulgated in the Irish Air Navigation Obstacle database. • Wind turbines or any structure exceeding 90m in height may require appropriate aviation warning lighting as agreed with IAA. • The IAA should be informed 30 days in advance of the erection of any structure exceeding 45m in height. Having regard to the above: • The developer will agree an aeronautical obstacle warning light scheme for the Proposed Wind Farm development with the IAA. • The developer will provide the IAA with as-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location. • The developer will notify the IAA of intention to commence crane operations with a minimum of 30 days prior notification of turbine erection.		
DURING CONSTRUCTION	Material Assets Water and Wastewater	• Pre-construction surveys will be completed to avoid disturbance to existing watermains. • All water and wastewater networks potentially affected by the grid route will be identified prior to construction. • The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with Uisce Eireann or other relevant authorities. • All works affecting the water and wastewater infrastructure will be carried out in ongoing consultation with the local authorities and service providers and will be in compliance with any requirements or guidelines they may have. • All construction phase and operation phase wastewater will be taken offsite by an authorised waste contractor and brought to an authorised waste facility.	Site Environmental Manager	Chapter 14 Material Assets
DURING CONSTRUCTION	Material Assets Waste Management	• Waste will be managed in accordance with the waste hierarchy in Council Directive 98/2008/EC on waste and Section 21A of the Waste Management Act 1996. • All waste for offsite treatment/disposal is to be stored temporarily in appropriate dedicated storage areas. The areas in which wastes are stored on site are segregated to prevent material and contaminated surface water runoff entering local surface water drains. • All chemical, hydrocarbon or other controlled wastes will be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required. • All waste to be removed from site will be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice and the site waste management plan.	Site Environmental Manager	Chapter 15 Material Assets
POST CONSTRUCTION /OPERATIONAL PHASE	Habitat Reinstatement Management	• Any hedgerow maintenance will be undertaken on a 3 to 4 year rotational cutting cycle to ensure a continual supply of food for pollinators. Suitable cutting equipment will be used to minimise unnecessary flaying and shredding of hedgerow vegetation to reduce risk of long-term damage and disease.	Operator Appointed Contractor	Chapter 6 Biodiversity

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		• Where hedgerows are maintained, they will be allowed to flower throughout the year to provide pollen and nectar to pollinators. Hedge cutting will be kept to a minimum for those located outside the buffer felling areas, wherein hedgerows will be kept short at 1m to 1.5 m in height to discourage their use by bats. Any necessary hedgerow maintenance will be undertaken between November and February, in line with the NBDC Data Series Guidance 'Pollinator-friendly management of wind farms'. Hedgerow maintenance will be prohibited during the bird nesting season (March-August, inclusive), which will also have positive effects on other wildlife such as insects.		
POST CONSTRUCTION /OPERATIONAL PHASE	Protection of Fauna - Bats	• A stringent post-construction monitoring programme shall be performed to assess any changes in bat activity patterns and help inform any potential mitigation in the form of turbine curtailment. • Monitoring will be completed annually for three years after construction. During this time period, casualty searches and acoustic monitoring will take place alongside one another. • Acoustic surveys can be used to continue to assess bat activity and behaviour following construction of turbines to assess any significant decrease or indeed increases in bat activity. Passive Automated Bat surveys (PAB) shall be conducted each year for three years over 10 nights in each of spring (April to May), summer (June to mid-August) and autumn (mid-August to October). The methodologies for these surveys are the same as those described in Appendix 6A – Ballinla Bat Survey Report. The PAB surveys can be accompanied with nighttime bat activity walkover surveys with the use of thermal imaging cameras as necessary to provide more detailed information on bat activity in the vicinity of turbines. • Systematic searches for bat casualties on the ground below wind turbines are currently the only effective means of monitoring bat fatalities. Searches should be undertaken as early as possible in the morning during high-risk periods. Data from the pre-application activity surveys show that the highest level of activity was recorded in the summer, as such it is concluded that this period is deemed to be of the highest risk for bats currently using the site. • Suitably trained dogs with handlers are significantly more efficient and faster than humans in locating carcasses and should preferably be used to achieve more robust results. The number of turbines surveyed should be proportional to the size of the site. • A limitation to conducting carcass searching is lack of access to the land beneath the turbine. As such it is essential that access is secured through liaising with the turbine operator and that land-use is conducive to performing a search. Systematic searches will be conducted within a 100m x 100m grid centred on the turbine, they will be conducted in at least two search periods, which is typically in the summer and autumn periods. Data must be obtained from the turbine operators on whether or not the target turbine(s) were operational on the night prior to the search, with the surveying procedure adjusted as necessary if the turbines were either non-operational or were not rotating because of a lack of wind. • Once all surveys have been conducted across the bat active season (spring, summer and autumn), data shall be compiled into an annual bat monitoring report, outlining the findings and implications for the wind farm operation, including any mitigation measures.	Operator Appointed Contractor	Chapter 6 Biodiversity

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
POST CONSTRUCTION /OPERATIONAL PHASE	Biodiversity Water Quality	• Where pipe culverts are proposed, any instream works will be carried out during the period of July – September (IFI, 2016). Appropriate periodic visual inspections of culverts during the operational phase will ensure they are maintained free from blockages, and there is no damage or erosion of the stream crossing wing walls, particularly after storm events. Silt ponds will also be inspected and maintained before the drains and verges have vegetated. Photographic records will also be taken during regular inspections and after major rainfall events. These will be collected and assessed by the ECoW or suitable qualified and competent person delegated by the ECoW. All records will be included in the CEMP and maintained onsite • It is important to keep ecological disruption of watercourses to a minimum and to maintain the aquatic ecosystem in a healthy, functional condition. Biological water quality monitoring will be undertaken to monitor surface water quality during the operational phase. • Macroinvertebrates will be sampled annually on the first, second and third years at aquatic sites listed in the aquatic report, and in future years if there is instability in the macroinvertebrate communities. Biotic indices corresponding with those used in the aquatic report, as well as Functional Feeding Group Analysis will be carried out in line with the methodology described the aquatic report. A key biotic index in this regard is the Quality Rating System. This biotic index has been shown to be a robust and sensitive measure of riverine water quality and has been linked with both chemical status and land use pressures in catchments (Clabby et al., 1992).	Operator Appointed Contractor	Chapter 6 Biodiversity
POST CONSTRUCTION /OPERATIONAL PHASE	Community fund	• In relation to the local community, with Community Benefit Fund Guidelines, governed by the Sustainable Energy Authority of Ireland (SEAI), and based on the current project scope, the Proposed Wind Farm Development will establish a Community Benefit Fund to be used to fund community projects for local residents. The fund will be up to a total of €246,000, dependant on the number of turbines constructed.	Operator	Chapter 5 Population and Human Health
POST CONSTRUCTION /OPERATIONAL PHASE	Ornithology Nocturnal Mitigation monitoring and curtailment	The collision risk assessment concluded that no species were predicted to experience significant collision mortality under the proposed turbine layout and operational parameters. This conclusion was based on low predicted collision rates, high species-specific avoidance rates, and the spatial distribution of flight activity relative to turbine locations. However, in line with best practice and precautionary principles (Drewitt & Langston, 2006; Rees, 2012), a post-construction monitoring programme has been proposed to validate these predictions. This includes systematic fatality monitoring, flight activity surveys, and species-specific monitoring (e.g. for whooper swan, woodcock, and breeding waders). The results of this monitoring will inform whether adaptive mitigation, such as curtailment, is required. In particular, curtailment measures have been proposed as a contingency for nocturnal migratory species, particularly whooper swan. If post-construction monitoring detects collision fatalities or increased migratory activity, a night-time (dusk to dawn) curtailment regime will be implemented during peak migration periods (15 September–15 December and 21 February–15 April). This approach reflects a conservative and responsive mitigation strategy, consistent with international	Operator Appointed Contractor	Chapter 7 Ornithology

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		best practice for high-sensitivity species All monitoring results will be reviewed annually, and any necessary adjustments to the mitigation strategy will be agreed with NPWS. This adaptive management approach ensures that the operational phase of the Proposed Development remains responsive to emerging data and continues to safeguard ornithological interests in line with national and international best practice.		
POST CONSTRUCTION /OPERATIONAL PHASE	Ornithology Post Construction Monitoring	To ensure that the operational phase of the Proposed Development does not result in significant adverse effects on ornithological receptors, a comprehensive post-construction monitoring programme will be implemented. This programme is designed to assess the efficacy of mitigation measures, detect any unforeseen impacts, and inform adaptive management strategies. The approach is consistent with best practice guidance from Drewitt and Langston (2006), which recommends the implementation of a structured post-development monitoring programme to assess collision risk, displacement, and barrier effects. Additionally, Rees (2012) highlights the importance of long-term monitoring for swan species to capture inter-annual variation and cumulative effects. The monitoring programme will include several key components. A fatality monitoring scheme will be conducted during years 1, 2, 3, 5, 10, 15, 20, and 30 post-construction. This will follow established methodologies (e.g. Shawn et al., 2010; Fijn et al., 2012; Grünkorn, 2011), including carcass removal trials to determine scavenger bias, and systematic turbine searches using standardised transects or trained dogs. The search area will extend to at least the turbine hub height radius, and search intervals will be informed by carcass persistence rates. Recorded fatalities will be adjusted for scavenger removal to estimate true mortality rates. Reports will be submitted to the competent authority and the National Parks and Wildlife Service (NPWS) following each monitoring year. Flight activity surveys will also be undertaken in years 1, 2, 3, 5, 10, and 15 post-construction, during both summer and winter periods. These surveys will include vantage point and hinterland observations in accordance with SNH (2017) guidance. The objective is to detect any barrier effects or changes in flight behaviour, particularly among raptors, owls, swans, wildfowl, and waders. Observations will focus on flight height, direction, and avoidance behaviour in proximity to turbines. To assess potential displacement of wintering wildfowl, a monthly wildfowl census will be conducted during the winter months of each monitoring year. This will replicate the baseline methodology and will help determine whether swans and other species have altered their habitat use in response to turbine operation. Similarly, breeding bird surveys (Common Bird Census) will be repeated during April to July in each monitoring year to assess changes in breeding bird density and distribution. Dedicated breeding wader and woodcock surveys will also be undertaken during April to June, using the same methods as the baseline surveys. Audio surveys for nocturnal migration activity will be conducted in years 1, 2, 3, 5, 10, 15, 20, and 30 post-construction, using the same methods as the baseline surveys.	Operator Appointed Contractor	Chapter 7 Ornithology

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		All monitoring results will be reviewed annually, and any necessary adjustments to the mitigation strategy will be agreed with NPWS. This adaptive management approach ensures that the operational phase of the Proposed Development remains responsive to emerging data and continues to safeguard ornithological interests in line with national and international best practice.		
POST CONSTRUCTION /OPERATIONAL PHASE	Land and Soils Soils and Geology	• During the operational phase of the Proposed Development, it is anticipated that routine maintenance of infrastructure and tracks will be required across the Site. This may include work such as maintaining access tracks and drainage and carrying out wind turbine maintenance. • Should any maintenance be required onsite which would involve construction type activities; construction mitigation measures will be adhered to in accordance with the CEMP to avoid potential effects.	Operator	Chapter 9 Land and Soils Chapter 8 Water
POST CONSTRUCTION /OPERATIONAL PHASE	Noise	**Wind Turbine Noise** • If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 Acoustics — Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels. 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 curves/planning conditions limits. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine performance. Following implementation of these measures, noise surveys will be repeated to confirm compliance with the noise criteria. **Amplitude Modulation** • In the event of a complaint which indicates potential amplitude modulation (AM) associated with turbine operation, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics (IOA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation	Operator	Chapter 10 Noise and Vibration

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		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 important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including mitigation. • These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include curtailment of turbines under specific operational conditions. • In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the Proposed Development will be effectively addressed by the operator. **Fixed Plant** • The assessment of noise from the operation of fixed plant at the substation is predicted to comply with the proposed criteria in Section 10.3.2.6. Therefore, no specific mitigation measures are required. However, at the detailed design stage the following measures will be employed to ensure the noise levels at NSL are within the proposed criterion and the potential for noise disturbance is minimised: • The selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission limits set out above are not exceeded. • All mechanical plant items e.g. fans, pumps etc. shall be regularly maintained to ensure that excessive noise generated any worn or rattling components is minimised. • Any new or replacement mechanical plant items, including plant located inside, shall be designed so that all noise emissions from site do not exceed the noise limits. • There are no tonal or impulsive characteristics from the plant operation audible at any NSL during nighttime periods. **Monitoring** • Commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a Proposed Development being commissioned.		
	Water	Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the lifetime of the operational phase of the Proposed Development.	Operator	Chapter 8 Water

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
DECOMMISSIONING	Reinstatement	If it is decided to decommission the Proposed Wind Farm at the end of its operational life of 35 years, a comprehensive reinstatement proposal, including the implementation of a program that details the removal of structures and landscaping, will be submitted to OCC and the NPWS for approval prior to the decommissioning work. The potential for impacts during decommissioning are similar in nature, if not in scope, to those assessed for the construction phase. All elements of the decommissioning works will be agreed with OCC beforehand and there will be a consent requirement for the timing of decommissioning works. The same mitigation for the construction phase of the Proposed Development will apply to the decommissioning phase. Any mitigation measures will be carried out using appropriate best practice at the time.	Operator	Chapter 6 Biodiversity
DECOMMISSIONING	Ornithology	Prior to the commencement of decommissioning works, a comprehensive ornithological survey will be undertaken to establish the presence and activity of breeding, wintering, and migratory bird species within and adjacent to the site. This will inform the timing and methodology of decommissioning activities. Where feasible, works will be scheduled outside of the bird breeding season to avoid disturbance to nesting birds. Should works be required during this period, pre-commencement checks by a qualified ornithologist will be mandatory, and appropriate buffer zones will be established around any active nests identified. Decommissioning operations will take place during the hours of daylight to minimise disturbances to roosting birds, or active nocturnal bird species. This in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt, A. L. & Langston, R. H., 2006). Mitigation measures will include the use of low-noise machinery and phased dismantling of infrastructure to reduce disturbance. Vegetation clearance will be minimised and confined to previously disturbed areas to avoid habitat loss. Additionally, reinstatement of habitats post-decommissioning will be prioritised, with native vegetation encouraged to reestablish, thereby supporting the long-term ecological integrity of the Site, in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt, A. L. & Langston, R. H., 2006). Toolbox talks shall be held with construction staff on disturbance to key species during decommissioning. This will help minimise disturbance. This in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt, A. L. & Langston, R. H., 2006).	Operator	Chapter 7 Ornithology

Time Frame/Schedule		Environmental Mitigation/Recommendation	Person(S) Responsible	Relevant Chapter/Action Required
		An Environmental Clerk of Works (ECoW) with ornithological expertise will oversee the implementation of these measures, ensuring adaptive management in response to any unforeseen ecological sensitivities encountered during the process.		
DECOMMISSIONING	Water	The potential impacts on the water environment during the decommissioning stage will be similar to those during the construction phase.	Operator	Chapter 8 Water
DECOMMISSIONING	Land and Soils	The potential impacts on the water environment during the decommissioning stage will be similar to those during the construction phase.	Operator	Chapter 9 Land and Soils
DECOMMISSIONING	Noise & Vibration	The potential impacts from noise and vibration during the decommissioning stage will be similar to those during the construction phase.	Operator	Chapter 10 Noise and Vibration
DECOMMISSIONING	Air and Climate	The potential impacts on the air and climate during the decommissioning stage will be similar to those during the construction phase.	Operator	Chapter 14 Air and Climate