CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

APPENDIX 4

MITIGATION MEASURES (EIS & NIS 2015)

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
***CONSTRUCTION (CHAPTER 7, VOLUME* 3B) – NOTE ALL OTHER MITIGATION MEASURES ARE ALSO RELEVANT TO CONSTRUCTION MITIGATION**					
1.1	General construction	Construction Management	In the event of approval being granted for the proposed development and prior to commencement of works, the contractor(s) which will be appointed by the Electricity Supply Board (ESB) will prepare a detailed Construction Environmental Management Plan (CEMP). An outline CEMP is included as, Appendix 7.1, Volume 3B Appendices in the EIS. The scope of the final CEMP will detail inter alia the implementation and management of environmental controls and mitigation measures (detailed in the EIS and summarised below). Monitoring of the construction phase shall be carried out by an Environmental Officer, in association with an ecologist (Ecologist Clerk of Work (ECoW) and archaeologist to ensure that all mitigation measures contained in the EIS and CEMP are implemented.	Pre-construction Phase	Yes. Detailed CEMP produced by contractor and agreed by ESB and subsequently with local and relevant prescribed authorities.
1.2	General construction	Construction Management – Client Engineer	A Client Engineer will be appointed and shall monitor and inspect the detailed designs, plant, material, and works including scheduling to ensure that these meet the requirements of the functional specification, designs and transmission standards.	Pre-construction Phase	Yes
1.3	General construction	Construction Management	Prior to construction, Notices and Schedules, as well as maps confirming the position of towers as approved by the Board, will be issued to landowners. EirGrid representatives will meet with landowners to deal with any queries the landowner may have following the issuing of the Notice.	Pre-construction Phase	None

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1.4	General construction	Construction Management – working hours	Access to the site will be during daylight for all construction stages. It is not anticipated that construction works will be carried out on Sunday, or Bank Holidays or that any construction works will be carried out in hours of darkness.	Construction Phase	None
1.5	General construction	Landowner Liaison	Prior to commencing the works, discussions will take place between the appointed landowner agents and landowners to ensure awareness of the specific works that will take place pursuant to the proposed development. All landowners will be contacted prior to access being required on their lands and a date of commencement for the works will be provided to the landowner before any work begins. The detailed design of access routes and construction methodology to be used, chosen from the methodologies identified in the EIS, will be based on the condition of land at the time of construction and will be discussed with the landowner prior to the commencement of works.	Pre-construction Phase	None
1.6	General construction	Construction Management	Prior to commencement of construction a full traffic management plan will be produced and implemented.	Pre-construction Phase	Monitoring required during construction
1.7	General construction	Construction Management	A Construction and Waste Management Plan (forming part of the CEMP) will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams.	Pre-construction Phase	None
1.8	General construction	Reinstatement	Once all the works are complete, the land used for temporary access routes and construction areas around the overhead structures will be reinstated as close as possible to their original condition.	Post Construction Phase	None

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HUMAN BEINGS – POPULATION & ECONOMIC (CHAPTERS 2 VOLUMES 3C and 3D) - No specific mitigation measures. Refer to other topics.					
HUMAN BEINGS – LAND USE (CHAPTERS 3 VOLUMES 3C and 3D)					
2.1	General construction	Construction Management	A method statement and work programme that shows the detailed phasing of work will be prepared prior to commencement of work.	Pre-construction Phase	None
2.2	General construction and operational maintenance works	Landowner Liaison	A wayleave agent will be appointed by the contractor to liaise with the landowners along the line route and ensure that their requirements for entry are met, so far as is possible. Landowners will be notified in advance of the commencement of any construction or maintenance works.	Construction Phase and Operation Phase	None
2.3	General construction	Comply with ESB / IFA agreement	All employees and contractors involved in the construction phase will receive adequate training – in particular in relation to issues relating to livestock safety and bio security on farms.	Construction Phase	None
2.4	General construction	Maintain access to agricultural land	The contractor will ensure that landowners have reasonable access to all parts of their farm during the construction phase.	Construction Phase	None
2.5	General construction	Minimise the risk of spreading animal and crop diseases	Disease protocols will be adhered to. The contractor will comply with any Department of Agriculture, Food & the Marine regulation pertaining to crops and livestock diseases.	Construction Phase	Yes

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2.6	N/A – general construction	Fencing of construction areas to prevent disturbance	Where required, appropriate fencing will be erected to exclude livestock from sites of construction.	Construction Phase	None
2.7	General construction	Minimise impact of rock breaking or piling, if required	In the unlikely event that rock breaking or pilling are required, owners of livestock in adjoining fields will be notified in advance.	Construction Phase	None
2.8	General construction	Minimise impacts to soil	Where topsoil is stripped back it will be replaced. All disturbed field surfaces will be re-instated. It will be the construction policy to minimise non-tracked vehicular access to sites in wet weather. Temporary access tracks (aluminium or panel tracks) will be laid in certain sites to avoid damage to soil. Vehicles which leak oil or fuel will not be allowed on construction or access sites. Any soil contaminated by fuel or concrete spillage will be removed from the site and dealt with appropriately as per legislative requirements.	Construction Phase	None
2.9	General construction	Minimise impacts to land drains	Affected land drains will be directed in a manner that maintains existing land drainage.	Construction Phase	None
2.10	General construction and operation phase	Ensure health and safety	ESB will provide safety information directly to all affected landowners e.g. Guidelines for Safe Working near Overhead Electricity Lines in Agriculture and Code of Practice for Avoiding Danger from Overhead Electricity Lines. These publications will enable farmers to fulfil their statutory requirements under Health and Safety Regulations.	Construction Phase and Operation Phase	None

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2.11	General construction and operation phase	Minimise impact on livestock	Helicopter inspections will be announced in local newspapers and the Farmer's Journal.	Operation Phase	None
HUMAN BEINGS – EMF (CHAPTERS 5 VOLUMES 3C and 3D)					
3.1	MSA	Minimise EMF levels	The configuration of the phases (that is the spatial arrangement of the two sets of three vertically aligned electricity wires) on the existing double circuit towers will be optimised to ensure EMF levels are minimised.	Pre-construction	None
FLORA AND FAUNA (CHAPTERS 6 VOLUMES 3C and 3D)					
4.1	General	Minimising risks such as disturbance to wildlife and protection of water quality	The key approach for minimising risks such as disturbance to wildlife and protection of water quality is the appointment of an appropriately experienced Ecological Clerk of Works (ECoW) on site during construction, to monitor the effectiveness of proposed mitigation measures in relation to known environmental effects and mitigation measures proposed in the EIS: The role of the ECoW will include: • Supervision of construction works and ensure compliance with legislation; • Monitoring habitats and species during the course of construction works and effectiveness of mitigation; • Provision of advice regarding the avoidance and minimisation of potential disturbance to wildlife;	Construction Phase and initial Operation Phase (5 years plus)	Yes. Monitored by ECoW.

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			• Provide recommendations on appropriate responses / actions to site specific issues (e.g. identification of previously unrecorded breeding sites during construction works); and • Liaison with NPWS, IFI and other prescribed authorities, when required. In addition to the construction phase, it is recommended that a site ecologist (ECoW) also be appointed during the pre-construction (landowner liaison stage) and post construction phases (up to 5 years) in particular to monitor mitigation measures regarding wintering birds.		
4.2	General	Construction Management	A CEMP will be implemented for the construction phase of the project with respect to all mitigation.	Construction Phase	Yes. Monitored by Environmental Officer
4.3	General	Construction Management	Work method statements, which will incorporate all the mitigation measures identified in the EIS, will be developed by construction and site contractors, agreed with statutory authorities and ECoW (where appropriate), and implemented by construction crews for all construction activities.	Construction Phase	Yes. Monitored by Environmental Officer
4.4	General	Protection aquatic ecology	As required, temporary silt screens will be installed in drains /small streams deemed to be at possible risk of water pollutant discharge. Where possible, towers (access routes, stringing areas and indicative works areas) have been located away from sites of ecological importance. Furthermore, where possible, access to tower locations will be via existing tracks that are regularly used by farm machinery. Existing field access points (e.g. gaps / farm gates) to local roads will be used to avoid creating additional hedgerow gaps.	Construction Phase	Yes. Monitored ECoW.

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4.5	General	Minimise impacts to habitats	Semi natural habitats such as wetlands and hedgerows will be avoided.	Construction Phase	Yes. Monitored ECoW.
4.6	General	Avoid the spread and introduction of invasive species and noxious weeds	Any invasive plant material noted on site will be removed off site and disposed of at appropriate licensed waste disposal facility. Any invasive species found to occur within 15m of working areas will require its eradication to avoid the spread of invasive species, to ensure compliance with the *European Communities (Birds and Natural Habitats) Regulations 2011* (S.I. No. 477 of 2011).	Construction Phase	Yes. Monitored by ECoW.
4.7	Towers located at field boundaries	To minimise impacts to habitats i.e. field boundaries comprised of hedgerows	The vegetation will be removed to ground level. Works will be implemented in a manner to minimise soil disturbance and compaction outside of the tower foundations. Post construction a wooden fence will be installed around the tower base to prevent livestock access and replanting carried out with low growing woody species of local provenance including Blackthorn, Hawthorn and Hazel. This will allow re-establishment of the hedgerow in the gap where the tower is located. It is expected that the hedgerows would be sufficiently robust within 5 years following construction that fencing could be removed. Where required, disturbed areas of grassland will be appropriately prepared and reseeded with a locally sourced grass mix, similar to that already occurring within the surrounding fields. Reseeding works will be undertaken within 3 weeks of construction works to avoid flushing of exposed soil downstream.	Construction Phase	Yes. Monitored by ECoW.
4.8	General	To minimise impacts to habitat i.e. trees	Tree cutting and lopping in proximity to conductors will be undertaken in a manner which minimises the requirement for extensive tree lopping. Large mature trees will be pollarded by qualified foresters / tree surgeons so as to retain as much of the treeline / linear habitat structure and in a manner which retains ground flora species and which does not kill the tree. The trimming regime will involve a scalloping or profiling effect which will minimise the effect on vegetation. Overall, it will not change the structure and ecological function	Construction Phase	Yes. Monitored by ECoW / Environmental Officer

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			of these linear woodland features and will not measurably affect associated fauna post construction.		
4.9	General	To minimise impacts to habitats i.e. trees	Where construction work is required close to mature trees, the National Joint Utilities Group *Guidelines for the Planning Installation and Maintenance of Utility Services in Proximity to Trees* (NJUG 10) will be followed so as to minimise damage.	Construction Phase	Yes. Monitored by ECoW / Environmental Officer
4.10	General	To minimise impacts to breeding birds	Scrub, hedgerow or tree removal / trimming will be undertaken outside of the bird nesting period, which begins on March 1st and continues until August 31st, in order to protect nesting birds. All birds and their nesting places are protected under the *Irish Wildlife Act 1976* (as amended 2000).	Construction Phase	Yes. Monitored by ECoW / Environmental Officer
4.11	General	Protection aquatic ecology	A drainage and sediment control plan will be implemented by contractors during site works. The plan will detail specific mitigation measures (taken from mitigation measures, outlined in Chapter 6 and 8 of this EIS) to address site specific issues.	Construction Phase	Yes. Monitored by Environmental Officer
4.12	General	Protection aquatic ecology	Potential impacts caused by spillages, drip and or spills during the construction phase will be reduced by the maintenance of an adequate supply of spill kits and hydrocarbon adsorbent packs at labelled stations at all working areas, with all vehicles on-site carrying spill kits. All personnel will be fully trained in the use of the equipment. Any used spill kits will be disposed of appropriately off-site.	Construction Phase	Yes. Monitored by Environmental Officer

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4.13	General	Protection aquatic ecology	A 24 hour, 7 day per week Emergency Response protocol for leaks / spill of hydrocarbons and / or chemicals will be drawn up and implemented. This must be implemented in the unlikely event of an accidental spillage of chemicals, hydrocarbons or release of protection aquatic ecology sediment to the surface or ground water system.	Construction Phase	Yes. Monitored by Environmental Officer
4.14	General	Protection aquatic ecology and sensitive habitats	Excavated materials from construction works will be deposited within the works area where there is no significant risk of runoff into local watercourses.	Construction Phase	Yes. Monitored by ECoW / Environmental Officer
4.15	General	Protection aquatic ecology water	As part of their environmental and works requirements, the contractor will establish a maintenance schedule and operational procedure / method statement for silt and pollution control measures during the construction period. This will be monitored for effectiveness by the contractor and ECoW.	Construction Phase	Yes. Monitored by Environmental Officer
4.16	General	Protection aquatic ecology Compliance with best practice	Oil, petrol and other fuel containers will be double-skinned and bunded to be able to contain 110% volume. Bund specification will conform to the current best practice for oil storage such as Enterprise Ireland's *Best Practice Guide BPGCS005 Oil Storage* Guidelines.	Construction Phase	Yes. Monitored by Environmental Officer
4.17	General	Protection aquatic ecology Compliance with best practice	Pouring of concrete will only take place in designated locations and concrete washings will be treated following current best practice guidelines including *Pollution Prevention Guidelines for Northern Ireland and Scotland*. Concrete washings will not be discharged to surface water and poured concrete will be allowed to cure for a minimum of 48 hours in the dry.	Construction Phase	Yes. Monitored by Environmental Officer
4.18	General	Protection aquatic ecology	Raw or uncured waste concrete or similar will be disposed of by removal to approved / licensed disposal site. It is noted that there will be a concrete truck wash out at the batching plant area. This washout will be directed to the three bay water recycler provided at this location.	Construction Phase	Yes. Monitored by Environmental Officer

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4.19	General	Protection aquatic ecology	Water courses which have been identified as potentially at risk of pollution from construction activities (e.g., drains and smaller streams linked to the River Boyne and Blackwater) will have appropriately designed silt traps (based on drain and potential runoff characteristics identified) installed in consultation with IFI (where necessary). Refer to **Chapter 8** in Volumes 3C and 3D for details.	Construction Phase	Yes. Monitored by Environmental Officer
4.20	General	Protection aquatic ecology	Refuelling of machinery will be carried out on level, hard surfaced designated areas where possible, at least 20m from watercourses and drainage ditches. In the event that refuelling is required outside of this area, fuel will be transported in a mobile double skinned tank and a spill tray will be employed during refuelling operations.	Construction Phase	Yes. Monitored by Environmental Officer
4.21	General	Protection habitats and aquatic ecology	All machinery will be regularly maintained and checked for leaks. Services will not be undertaken within 50m of aquatic features, including dry drainage ditches. Servicing must be undertaken on level, hard surfaced designated areas where possible.	Construction Phase	Yes. Monitored by Environmental Officer
4.22	General Construction	Protection aquatic ecology	Construction materials such as hydrocarbon, cement and grout will be stored in bunded areas or silos which will be regularly inspected by the site manager.	Construction Phase	Yes. Monitored by Environmental Officer
4.23	General Construction	Protection aquatic ecology	Weather conditions will be taken into account when planning construction activities to minimise risk of extreme run off from works areas.	Construction Phase	Yes. Monitored by Environmental Officer
4.24	General Construction	To minimise impacts to bats	Given the likely timescale (likely to be greater than 2 years) between any decision to grant planning approval and actual site clearance and construction, confirmatory bat surveys / monitoring of specific mature trees identified for felling will be undertaken by a bat specialist prior to tree cutting. In order to proceed with the felling of trees that may be identified as bat roosts, it will be	Pre-construction Phase and Construction Phase	Yes. Monitored by ECoW

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			necessary to acquire a derogation licence from NPWS. NRA, (2006) *Guidance in relation to tree felling and hedgerow removal* will be followed throughout the site clearance phase of the proposed development		
4.25	General Construction	To minimise impacts to Otters	Pre-construction surveys to confirm presence / absence of Otter breeding sites in relation to the conditions which have been evaluated this EIS will be undertaken at watercourses and adjacent habitats that occur in close proximity to tower locations and tree felling areas. Details of the pre-construction verification / monitoring methodology and the approach to be taken will be outlined in the CEMP that is to be drawn up for the construction phase of the development with reference to relevant guidance documents. No direct impacts are expected to arise as works will require an agreed method statement and be monitored by the ECoW.	Pre-construction Phase and Construction Phase	Yes. Monitored by ECoW
4.26	General construction.	To minimise impacts to Kingfishers	Given the likely timescale between any decision to grant planning approval and the commencement of actual site clearance and construction, pre-construction surveys to confirm the conditions which have been evaluated will be undertaken at watercourses and adjacent habitats (linked to the River Boyne and Blackwater) that occur in close proximity to tower locations and tree felling areas to confirm presence / absence of Kingfisher breeding sites.	Pre-construction Phase and Construction Phase	Yes. Monitored by ECoW.
4.27	General construction	To minimise impacts to Badgers	Surveys for Badger setts will be conducted at woody vegetation required for cutting. This is required to confirm that site clearance activities are in line with the receiving environment considered in this EIS. A buffer zone will be established around any known Badger setts through the erection of temporary posts and wires with ―no entry‖ signs erected. Any works within 50m of a sett will require a licence from NPWS. No direct impacts are expected to arise as works will require an agreed method statement and be monitored by the ECoW.	Pre-construction Phase and Construction Phase	Yes. Monitored by ECoW.

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
4.28	General	Hedgerow re growth and fence maintenance	Where poor or no hedgerow re-growth has occurred, replanting with similar native hedgerow species will be carried out so as to ensure linear habitats are retained / re-established. If new fencing is required or maintenance then this will be agreed and implemented with the landowner.	Post Construction	Yes. 2 years post construction.
4.29	General During maintenance works	During maintenance works, consideration will be given to ensure ongoing protection of water quality.	Depending on the nature of the proposed maintenance works; there may be a requirement for risk assessments of potential impacts to surface waters and appropriate mitigation will be implemented where a risk is identified.	Post Construction	Yes. Ongoing (depending on works requirements)
SOILS, GEOLOGY AND HYDROGEOLOGY (CHAPTERS 7 OF VOLUMES 3C AND 3D)					
5.1	Lemgare CGS, Altmush CGS, Galtrim CGS and the Boyne CGS	To mitigate potential impacts	The mitigation measures agreed with the GSI for site investigation works / construction of the towers include the following; • Continued consultation with the GSI; • Limiting excavation by only excavating the required footprint; • Maintaining an adequate distance from Lemgare pNHA, and Altmush Stream; and The GSI will be notified about any significant new section / feature that is exposed within the tower footprint.	Construction Phase	None
5.2	General	Effective treatment of spoil material	Excavated soil and subsoil will be stored adjacent to the excavation area. Excavated material will be reused in situ where possible. In the event no material is suitable / wanted for reuse by landowners, subsoil will be disposed of in accordance with all applicable legislative requirements.	Construction Phase	None

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
5.3	General	Dealing with unexpected, contaminated land	All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should it be determined that any of the soil excavated is contaminated, this will be dealt with appropriately as per all applicable legislative requirements.	Construction Phase	Monitoring required during construction
5.4	General	To minimise impact from material spillages	All oils and fuels used during construction will be stored on temporary proprietary bunded surface (i.e. contained bunded plastic surface). These will be moved to each tower location as construction progresses. Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place away from surface water gullies or drains. No refuelling will be allowed within 50m of a stream / river. Spill kits and hydrocarbon absorbent packs will be stored in this area and operators will be fully trained in the use of this equipment.	Construction Phase	Monitoring required during construction
5.5	General	Minimise impacts to soils	Controlling working practices by, for example, minimising land take, avoiding repetitive handling of soils, minimising vehicle movements off road and limiting the size of stockpiles will reduce the compaction and erosion of material. Soils will be reinstated at the towers and along the temporary access route.	Construction Phase	None
5.6	Tower Locations	Minimise impacts to existing wells and boreholes	Where it is necessary to dewater to construct the tower foundations in close proximity of wells, monitoring will be carried out of wells within 100m of the tower locations.	Construction Phase	Monitoring required during construction
5.7	General – construction	Minimise impacts to existing wells and boreholes. Protection of the quality of the receiving water system.	Water pumped from the excavations may contain suspended solids. Settlement may be required to reduce the suspended solids concentrations to protect the quality of the receiving water system. Settlement will be undertaken by a standard water filtration system to control the amount of sediment in surface water runoff. Direct discharge to streams or rivers will not be permitted.	Construction Phase	Monitoring required during construction

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
5.8		Tara Mines	Liaison will be undertaken with Tara Mines during construction / operation phase to ensure no conflicts arise.		
WATER (CHAPTERS 8 OF VOLUMES 3C AND 3D)					
6.1	General Construction Phase	To prevent water pollution	All works will be undertaken with due regard to the guidance contained within CIRIA Document C741 2015 *Environmental Good Practice on Site*.	Construction Phase	None
6.2	Where tree felling may be required	To prevent water pollution during felling of forestry	Consultation will be undertaken with Inland Fisheries Ireland (IFI) and NPWS before commencing felling operations in areas of importance to fisheries and wildlife. Sediment traps will be installed prior to felling and maintained on a daily basis throughout felling operations. Trees will be felled away from the aquatic zone. Machine extraction will not occur in the riparian zone. On sites where risk of erosion is high (steep slopes and / or adjacent to rivers), brash mats will be used to avoid soil damage, erosion and sedimentation. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off- road routes, to protect the soil from compaction and rutting. Felling will not occur during periods of high rainfall to prevent runoff. No refuelling or machinery maintenance will occur within 50m of an aquatic zone. Timber will be stored on dry areas away from the riparian zones. The forest felling effects of the overhead transmission line will be short term during construction phase.	Construction Phase	Monitoring required during Construction Phase.
6.3	Near watercourses (including the River	Protection of Watercourses	Silt barrier / silt curtains will be used where towers or works are undertaken near watercourses. In relation to the River Boyne and Blackwater the towers are located a minimum of 60m and 100m respectively from these rivers. However,	Construction Phase	Monitoring required during construction

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
	Boyne and Blackwater)		notwithstanding this distance, it is proposed to use silt barriers / curtains for tower construction near those rivers.		
6.4	General Construction	Minimise impacts on soils	Stockpiles will be graded to a <1:4 profile. Topsoil and subsoils will be stored separately. Stockpiles of mineral soils and peat will be <2m and <1m respectively. Geotechnical supervision in combination with monitoring will ensure that any peat encountered is stored in suitable areas.	Construction Phase	Monitoring required during construction
6.5	Near watercourses	Protection of Watercourses	Where it would be necessary to dewater to construct the tower foundations precautions will be taken to ensure there is no adverse effects on nearby watercourses including the resultant water being filtered before discharge.	Construction Phase	Yes, on the discharge water quality.
6.6	Near watercourses	Protection of Watercourses	Precautions will be taken to avoid spillages. These include: • Use of secondary containment, e.g. bunds around oil storage tanks; • Use of drip trays around mobile plant; • Supervising all deliveries and refuelling activities; and • Designating and using specific impermeable refuelling areas isolated from surface water drains.	Construction Phase	Yes, during construction
6.7	Near watercourses	Protection of Watercourses	With regard to onsite storage facilities and activities, any raw materials and fuels, will be stored within bunded areas, if appropriate to guard against potential accidental spills or leakages. All equipment and machinery will have regular checking for leakages and quality of performance.	Construction Phase	Yes - equipment

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
6.8	Near watercourses	Protection of Watercourses	All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. Spill kits are retained to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use. Any servicing of vehicles will be confined to designated and suitably protected areas. Any pollution incident or spill will be reported to the regulator and remediated to their original condition.	Construction Phase	Ongoing monitoring required during construction
6.9	Near watercourses	Protection of Watercourses	Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite.	Construction Phase	Ongoing monitoring required during construction
6.10	Temporary Access Tracks and Tower Foundations	Protection of Watercourses	At certain locations where very poor soft ground is encountered, Type 2 temporary access track may have to be laid. Generally temporary access tracks use rubber or aluminium road panels. Temporary access tracks will be up to 4m wide and routed away from drains where possible. In sensitive locations silt barriers will be used to prevent direct runoff to local watercourses.	Construction Phase	
6.11	Temporary Access Routes and Tower Foundations	Protection of water quality	Preventative measures will ensure that input suspended solids concentrations will be minimised at source. This will be achieved by ensuring that all silt / clay and topsoil is properly stored during the construction phase of the development.	Construction Phase	Ongoing Monitoring required during construction.
6.12	Construction Temporary Access Routes and Tower Foundations	Protection of Water Quality	Water quality monitoring will be undertaken prior to the commencement of construction to confirm baseline data and ensure there is no deterioration in water quality. This will be targeted on watercourses considered to be at a higher risk of pollution (i.e. towers where there are watercourses within 20m of the construction works). Water quality monitoring will include daily inspection of adjacent watercourses.	Prior to and during the Construction Phase	Ongoing Monitoring, observing and sampling required during construction.

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
6.13	Construction- Material Storage Yard	Protection of Water Quality	The surface water drainage system at the construction material storage yard will take into account the recommendations of the CIRIA C468 and utilises SuDs (sustainable urban drainage) devices where appropriate. Runoff from site will be limited to greenfield runoff rates. Runoff will pass through a silt trap, oil interceptor and settlement lagoon before being discharge to the surface water.	Prior to and during the Construction Phase	Ongoing observing and sampling required during
6.14	Woodland Substation	Protection of Water Quality	Implementing the design standards of the GDSDS, the surface water drainage system at Woodland takes into account the recommendations of the GDSDS and utilises SuDs (sustainable urban drainage) devices where appropriate. Runoff from hardstand areas at Woodland Substation will be limited to greenfield runoff rates.	Prior to and during the Construction Phase	Ongoing observation required
AIR – NOISE & VIBRATION (CHAPTER 9 OF VOLUMES 3C AND 3D)					
7.1	Construction Phase	To ensure compliance with appropriate European Standards	The contractor appointed will have to ensure that all plant items used during the construction phase will comply with standards outlined in European Communities (*Construction Plant and Equipment) (Permissible Noise Levels) Regulations* (1990). The contractor will make reference to BS5228: *Noise Control on Construction and Open Sites* (2009), which offers detailed guidance on the control of noise from construction activities.	Construction Phase	Ongoing monitoring required during construction.
7.2	Construction Phase	To ensure the adoption of appropriate practices during construction	It is proposed that various practices be adopted including: • Nighttime working will typically not occur; however, there may be a necessity to continue to operate generator, pumps or other equivalent machinery at a number of locations, where the digging of foundations and erection of towers may cause activity to remain in one location for a longer period of time; • On these infrequent occasions screening and enclosures can be utilised. For maximum effectiveness, a screen should be positioned as close as possible to either the noise source or receiver. The screen should be constructed of material with a mass of > 7kg/m2 and should have no gaps	Construction Phase	Ongoing monitoring required during construction.

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			or joints in the barrier material. This can be used to limit noise impact to 45dB (A) Leq (BS 5228 acceptable nighttime level) at any noise sensitive receptors, if required by agreement with the local authority; • Appoint a site representative responsible for matters relating to noise; and • Establishing channels of communication between the contractor / developer, local authority and resident i.e. for notification of requirement of night works, should this be required.		
7.3	Construction Phase	Use of appropriate noise control measures during construction	• Furthermore, it is envisaged that a variety of practicable noise control measures will be employed, these may include: • Selection of plant with low inherent potential for generation of noise and / or vibration; • Erection of temporary barriers around items such as generators or high duty compressors. For maximum effectiveness, a barrier should be positioned as close as possible to either the noise source or receiver. The barrier should be constructed of material with a mass of > 7kg/m2 and should have no gaps or joints in the barrier material, • As a rough guide, the length of a barrier should be 5 times greater than its height. A shorter barrier should be bent around the noise source, to ensure no part of the noise source is visible from the receiving location; and • Positioning of noisy plant as far away from sensitive receptors, as permitted by site constraints.	Construction Phase	Ongoing monitoring required during construction
7.4	Construction Phase	Use of appropriate construction phase vibration mitigation	Any construction works that have the potential to cause vibration at sensitive receptors will be carried out in accordance with the limit values as set out in the EIS.	Construction Phase	Ongoing monitoring required during construction

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7.5	Unknown at time of writing	To minimise noise impact to sensitive receptors	Use of temporary noise barriers around rock breaking activity if noise impact to sensitive receptors is deemed likely.	For duration of localised rock breaking	Noise monitoring of closest sensitive receptor or representative location.
AIR – QUALITY AND CLIMATE (CHAPTER 10 OF VOLUME 3C AND 3D)					
8.1	General Development wide construction phase	Protection properties significant nuisance of from dust	Mitigation measures will be employed on a site-specific basis based on a review of the construction activities involved and their proximity to nearby receptors in each location. The site specific mitigation measures will be employed to ensure that properties within 50m of the construction locations will not be subject to significant dust nuisance. The types of mitigation measures include the following: • A water bowser will be available to spray work areas, especially during periods of excavations works coinciding with dry periods of weather, in order to suppress dust migration; • All loads which could cause a dust nuisance will be covered to minimise the potential for fugitive emissions; and • Stockpiled material during the construction phase will be sprayed during periods of dry weather in order to suppress dust migration from the site.	Construction Phase	Ongoing monitoring required during construction (in the context the CEMP).
LANDSCAPE CHAPTER 11 OF VOLUMES 3C AND 3D)					
9.1	Development wide construction phase	Minimise physical landscape effects on vegetation	The key mitigation measures described in the Flora and Fauna section (section 4 of this table) will serve to minimise physical landscape effects arising from disturbance to vegetation and soils. The key mitigation measures as described in the Flora and Fauna section in relation to landscape effects are; using existing access routes and gaps in hedgerows, reinstatement of hedgerows and ground vegetation (with similar or better quality planting), protection of	Construction and Operational Phase	Ongoing monitoring required by a qualified Landscape Architect during construction and

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			retained vegetation, sensitive vegetation pruning methods including pollarding of mature trees to retain hedgerow lines, monitoring of vegetation establishment over 24 months, and replanting in the event of any reinstatement failures. Hedgerows will be maintained to ensure no vegetation is tall enough to potentially interfere with the conductors.		inspection of reinstated planting over a 24 month period
9.2	Development wide construction phase	Minimise physical landscape effects on soil	The mitigation measures in section 5 – Soils, Geology and Hydrogeology will serve to minimise physical landscape effects on soil and subsequent vegetation establishment. The key mitigation measures as described in this section in relation to landscape effects are; correct removal, storage and reinstatement of subsoil and topsoil, avoidance of soil compaction and removal and disposal of soil where not required for reinstatement.	Construction and Operational Phase	Ongoing monitoring required by a qualified Landscape Architect during construction and inspection of earthworks over a 24 month period
9.3	Blackwater Valley	To mitigate landscape character and visual impact in a valley landscape	Micro mitigation is possible through the retention or enhancement of trees and hedgerows in key locations	Construction Phase	Ongoing monitoring required by a qualified Landscape Architect during construction and inspection of reinstated planting over a 24 month period
9.4	Brittas Estate	To reduce the potential impact on a historic designed landscape	The clearance of existing vegetation will be minimised in this area and in consultation with the landowner appropriate screening could be planted on either side of the entrance road and other locations within the estate to limit the views towards the proposed development.	Construction phase	Ongoing monitoring required by a qualified Landscape Architect during construction and

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
					inspection of reinstated planting over a 24 month period
9.5	Boyne Valley	To mitigate landscape character and visual impact in a valley landscape, on a protected viewpoint and on a view from Bective Abbey	Micro mitigation is possible through the retention or enhancement of trees and hedgerows in key locations.	Construction phase	Ongoing monitoring required by a qualified Landscape Architect during construction and inspection of reinstated planting over a 24 month period.
MATERIAL ASSETS – GENERAL (CHAPTER 12 OF VOLUMES 3C AND 3D)					
10.1	Development wide - General	To minimise impacts on electricity, telecoms & gas	A pre-construction survey for utilities such as gas, electricity, telecoms etc. will be undertaken during the construction phase, including ground investigations, to confirm the conditions which have been encountered in the EIS.	Prior to construction	None
10.2	At the crossing of OHL and telecoms services is necessary	To minimise disruption to existing electricity & telecoms during construction	Certain obstacles along a straight have to be guarded such as road / railway crossings and other transmission or distribution lines by way of temporary guard poles.	Construction phase	None
10.3	Development Wide General – Construction Phase	To comply with Best Practice Guidelines on the Preparation of Waste Management	Waste management will be carried out in accordance with Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects (2006) produced by the Department of Environment, Community and Local Government.	Construction Phase	None

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
		Plans for Construction & Demolition Projects (2006)	A Construction Waste Management Plan (which will form part of the CEMP) will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams. The key principles underlying the plan will be to minimise waste generation and to segregate waste at source.		
MATERIAL ASSETS – TRAFFIC (CHAPTER 13 OF VOLUMES 3C AND 3D)					
11.1	Development Wide General – Construction Phase	The preparation and implementation of a Construction Traffic Management Plan. The objective of this plan will be to minimise the impact caused by the construction stage of the project	It shall be a requirement of the contractor appointed to construct the project to prepare a detailed Construction Traffic Management Plan prior to the commencement of construction operations. As a minimum, the mitigation measures should include the following: • Development of a detailed construction programme aimed at minimising peaks in traffic volumes on specific roads; • Continuous monitoring of the roads used for construction; • Identification of traffic management measures with respect to road closures; • Measures for continuous liaison with local authorities and other relevant stakeholders; • Identification of traffic management measures at site entrances; and • Measures for accommodating emergency response vehicles along the haul routes.	Prior to the commencement of the construction phase. Continuous updating throughout the construction stage.	Monitoring of roads used during construction stage required.
CULTURAL HERITAGE (CHAPTER 14 OF VOLUMES 3C AND 3D)					
12.1	General – Construction	To mitigate against potential impacts during the construction phase	In areas where it has been identified that there is the potential that archaeological, architectural or cultural heritage site, structures, monuments or features could be impacted on during the construction phase, one or more of the following mitigations measures have been recommended in the EIS:	Prior to the construction phase and throughout construction	Ongoing implementation of

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			• Archaeological monitoring – in areas of moderate archaeological potential, excavations associated with construction works and / or facilitating access to the construction site and / or stringing areas will be monitored by a suitably qualified archaeologist. In the event that archaeological deposits are discovered, work in the area will cease immediately and the archaeologist will liaise with the National Monuments Service of the DAHG and the National Museum of Ireland. • Archaeological testing – best practice in areas of high archaeological potential demands caution, to ensure that archaeological deposits are identified as early as possible, thereby ensuring that any loss from the archaeological record is minimised. Under a monitoring remit, an archaeologist will observe normal construction works, usually undertaken with a toothed excavator bucket. During archaeological testing a licensed eligible archaeologist supervises excavations undertaken with a toothless grading bucket, under licence to the National Monuments Service of the DAHG, thereby ensuring the early identification of archaeological deposits and minimal loss to the archaeological record. Undertaking this confirmatory surveying will ensure that sufficient time can be allowed within the construction schedule for the excavation of any archaeological deposits discovered. • Demarcation – where it has been identified that there is the potential that an archaeological, architectural or cultural heritage site, structure or monument or could be impacted upon in gaining access to construct the proposed development then demarcation has been recommended to prevent any inadvertent damage. A suitably qualified archaeologist will access the site prior to the commencement of construction works in the area and demarcate a buffer around the site, structure or monument that will remain in place throughout any construction works in the vicinity.		archaeological monitoring, archaeological testing and other recommended mitigation strategies.

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			• Confirmation of temporary access routes – at a number of locations confirmation of the proposed construction temporary access routes will take place, in consultation with the construction team and prior to commencement of construction works, to ensure that the surviving historic fabric of buildings is not impacted on in gaining access for construction activities. To this end the temporary access routes may be revised, sensitive features highlighted and demarcated or different construction machinery or methods (as identified in the EIS) may be used that can access the site without impacting on the historic fabric. • Monitoring of tree surgery – in a couple of instances there is dense vegetation that will have been to be trimmed in the vicinity of upstanding remains of buildings that are indicated on historic mapping. This work will be monitored by a suitably qualified archaeologist to ensure that the historic fabric of the buildings is not impacted upon by the works.		
12.2	Development Wide General – Construction Phase	To ensure the implementation of the mitigation measures during the construction phase	It is recommended that a suitably qualified cultural heritage consultancy / consultant be appointed to oversee the effective implementation of the mitigation measures recommended in this EIS for the construction phase of the proposed development. The consultancy / consultant should maintain continuing liaison with the National Monuments Service of the DAHG throughout the construction phase of the development.	Construction phase	None
12.3	Development wide general	To comply with the Code of Practice Between the National Monuments Service of the DoEHLG (now DAHG) and ESB Networks (2009)	In line with the Code of Practice Between the National Monuments Service of the DoEHLG (now DAHG) and ESB Networks (2009), a project archaeologist will be appointed to oversee the effective implementation of the recommended archaeological mitigation during the proposed works.	Construction phase	None

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
12.4	Teltown Zone of Archaeological Amenity (ZAA)	To mitigate impact on Teltown ZAA	The following mitigation strategies have been formulated for the Teltown ZAA: • Test pits for other environmental and engineering disciplines will be subject to archaeological monitoring by a suitably qualified archaeologist; • Archaeological testing – best practice in areas of high archaeological potential demands caution, to ensure that archaeological deposits are identified as early as possible, thereby ensuring that any loss from the archaeological record is minimised. During archaeological testing a licence eligible archaeologist supervises excavations undertaken with a toothless grading bucket, under licence to the National Monuments Service of the DAHG, thereby ensuring the early identification of archaeological deposits and minimal loss to the archaeological record. Undertaking this work preconstruction will ensure that sufficient time can be allowed within the construction schedule for the excavation of any archaeological deposits discovered. All tower and guarding locations within the Teltown ZAA will be subject to a regime of pre-construction archaeological testing under licence to the National Monuments Service of the DAHG. The National Monuments Service of the DAHG and the National Museum of Ireland will be consulted immediately should archaeology be discovered and allowance will be made for full archaeological resolution; • During the construction phase a suitably qualified archaeologist will monitor site access and construction works. Ensure that where appropriate low ground pressure vehicles or panel tracks are used to minimise ground disturbance. Type 3 temporary access tracks will not be used within the Teltown ZAA. Low ground pressure vehicles and Type 2 temporary access tracks will be used to minimise ground disturbance. The Derrick Pole Methodology (see Volume 3B Section 7.3.4.3.2 of the EIS) will be used for tower construction; mobile cranes will not be used; and • A suitably qualified archaeologist will monitor access and construction of any guarding areas required within the ZAA.	Construction phase	None

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
12.5	Various Locations	To mitigate against potential impacts during the construction phase of tower locations, guarding areas and 110kV line crossings, and associated temporary access tracks.	Refer to summary of mitigation measures as listed in Chapter 14, **Volumes 3C** and **Volume 3D**.	Construction phase	Monitoring required during construction
12.6	Brittas House (RPS No. MH005-105)	To reduce the potential impact on the setting of entrance avenue to Brittas House (RPS No. MH005-105), Co Meath	The clearance of existing vegetation will be minimised in this area and in consultation with the landowner appropriate screening will be planted on either side of the lane to limit the views towards the proposed development.	Construction phase	Monitoring required during construction
Natura Impact Statement Mitigation					
13.1	Various as detailed within mitigation	Protection of Terrestrial Qualifying Fauna Breeding Sites Kingfisher	Riparian areas at the following locations were identified as potential breeding sites for Kingfisher where disturbance of breeding sites associated with woody vegetation trimming / tree lopping may arise. These areas include: Boycetown River between Towers 376 and 377; Stream between Towers 358 and 359; Stream between Towers 350 and 351; Clady River, three crossings between Towers 344 and 347; Small stream between Towers 313 and 314; Small stream between Towers 317 and 318; and	Pre-Construction	Yes

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			Kilmainham River between Towers 251 and 252. Confirmatory pre-construction surveys will be undertaken at watercourses linked to the River Boyne and River Blackwater, where tree felling may lead to potential disturbance to Kingfisher breeding sites, in order to avoid impacts to this species. If tree cutting is required at a breeding Kingfisher site, then this work will only take place once Kingfishers have finished breeding (as confirmed by ECoW) or outside the Kingfisher breeding season (typically March to end August). Thus, tree-cutting will be conducted in a manner which does not damage the breeding site / river bank through careful pollarding of tree limbs and retention of tree root structures and lower vegetation under which this species typically breeds.		
13.2	Various as detailed within mitigation	Protection of Terrestrial Qualifying Fauna Breeding Sites Otter	Riparian areas at the following locations were identified as potential breeding sites for otter where disturbance of breeding sites associated with woody vegetation trimming / tree lopping may arise. • Boycetown River between Towers 376 and 377; • Stream between Towers 358 and 359; • Stream between Towers 350 and 351; • Clady River, three crossings between Towers 344 and 347; • Small stream between Towers 313 and 314; • Small stream between Towers 317 and 318; and • Kilmainham River between Towers 251 and 252. Again, in order to avoid impacts to otter, confirmatory pre-construction surveys will be undertaken at watercourses linked to the River Boyne and River Blackwater where tree felling may lead to potential disturbance to otter breeding or resting sites.	Pre-Construction	Yes

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			If an otter breeding site is determined that may possibly be disturbed, then tree trimming activities will be suspended until such time that the otter breeding site is vacated and breeding activity is finished, as confirmed by ECoW. As stated above, tree trimming will be conducted in a manner which does not damage the breeding site / river bank through careful pollarding of tree limbs and retention of tree root structures and lower vegetation under which this species typically breeds.		
13.3	Various as detailed within mitigation	Protection of Water Quality & Aquatic Fauna	The following mitigation measures will be implemented in respect of specific works locations, including the towers in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA and will include a requirement to implement the following measures: - Silt barrier / silt curtains will be used where towers are to be located and / or works are to be undertaken near watercourses, such as in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA. - Correct installation of silt fences is vital and will be supervised by the construction manager and ECoW. The silt barrier / silt curtain will be shaped and installed so that it will catch runoff, without the water flowing underneath or around the edge. - The silt barrier will be located down-gradient of the works and inspected on a regular basis including during and after rainfall events. For steep slopes, such as in the vicinity of Tower 355, more than one silt curtain will be used. The edges of the silt curtain will be turned upslope to prevent water going around the edges. ii- Grips, sumps, straw bales and sediment traps will be installed to capture silt where applicable. Each of these should be maintained daily by the	Pre-Construction & During	Yes

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			contractor to ensure that they remain effective and do not increase the likelihood of an incident occurring. - It is not anticipated that any localised groundwater dewatering will be required at tower construction locations in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA. However, in the unlikely event that localised groundwater dewatering is required (at tower construction locations) significant impacts on the groundwater level will be realised only in close proximity to the point of abstraction. - Monitoring will be undertaken on the discharge water quality. Treated water discharged is likely to be at a very small scale and can be discharged onto the adjacent field. No discharge will take place directly to water courses linked to European sites. Precautionary measures will be taken to avoid spillages of contaminants including oils / fuels and concrete or cement (at tower construction sites). These include:the use of secondary containment, e.g. bunds around oil storage tanks; o use of drip trays around mobile plant; o supervising all deliveries and refuelling activities; and o designating and using specific impermeable refuelling areas isolated from surface water drains. - With regard to on site storage facilities and activities, any raw materials and fuels, will be stored within bunded areas, to guard against potential accidental spills or leakages entering local watercourses linked to the European sites.		

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			- All equipment and machinery will have regular checking for leakages and quality of performance. No raw materials or fuels will be stored within, or in the vicinity of, the European sites. - All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. Spill kits are retained to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use. - Any servicing of vehicles will be confined to designated and suitably protected areas, and there will be no servicing or refuelling of vehicles within, or in the vicinity of, the European sites. - Any pollution incident or spill will be reported to the site supervisor an appropriate action taken. - Temporary access roads used will be temporary rubber or aluminium road panels at a number of specific locations. Tracks will be routed away from drains in those locations. - All temporary access tracks will be removed at the end of the construction phase and the land will be restored to its original condition. - Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite or at the location where concrete was sourced.		

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			- Water quality monitoring will be undertaken prior to the commencement of construction to confirm baseline data and ensure that, during the construction phase of the proposed development, there is no deterioration in water quality. In particular, such confirmatory monitoring will be targeted at watercourses considered to have a higher potential for pollution (e.g. towers where there are watercourses within 20m of the construction works). At these locations, water quality monitoring will include daily inspection of adjacent watercourses. Regular sampling for pH and conductivity will be undertaken in order to ensure the implementation and effectiveness of the recommended mitigation measures - Daily observations of watercourses close to construction works will be logged and details of observations including photographs will be recorded - . In the unlikely event that any pollution event is suspected to have occurred, samples will be collected upstream and downstream of this point and sent to an appropriately accredited laboratory for analysis. - All works will halt until the source has been identified, controlled and any remediation undertaken.		
13.4	General Operational Phase	Whooper Swans Protection	A clearly defined monitoring programme will be implemented for Whooper Swans to assess the effectiveness of line marking. All locations where flightlines were identified will be surveyed during the pre-construction stage, construction and operation stages (up to 5 years). Confirmatory surveys will be conducted at all sites identified, monthly between October and April when Whooper Swans are present in the area. Throughout the lifetime of the proposed monitoring works, additional areas where flightlines or collisions are recorded will be added	Prior to Construction & Operational	Yes

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
			to the list of areas to be surveyed. Landowners with towers on their land will be engaged with and encouraged to get in touch with the bird surveyor regarding observed Whooper Swan or other bird species collisions.		
13.5	Construction and Operational Monitoring	Whooper Swans Protection	The results of winter monitoring studies and engagement with landowners will inform further actions to minimise risks as highly transient species (in terms of distribution and flightlines) like Whooper Swans require ongoing consideration after the planning stage. Yearly monitoring reports for the construction and operational phases will detail required actions and will be drafted in consultation with NPWS or other relevant experts as appropriate.	Construction & Operational	Yes
13.6	Operational Phase Mitigation	Whooper Swans Protection	'The type of flight diverters recommended for installation are swan flight diverter markers constructed from high impact grey PVC (UV stabilised) fitted approximately 5m apart along each earth wire. This line marking is proposed for the earth wires to increase visibility of the earth wires to flying birds.	Construction & Operational	Yes
13.7	Operational Phase Mitigation	Whooper Swans Protection	'At one location between towers 355 and 357 aviation marker spheres will be installed which serve a dual purpose of acting as a bird flight diverter at this location.	Construction & Operational	Yes
13.8	Operational Phase Mitigation	Whooper Swans Protection	Areas identified as requiring line marking are defined as; “Locations in which the alignment bisects observed relatively regular flight paths by Whooper Swan between feeding and roosting areas”, larger river crossings (including the River Boyne) or nationally important concentrations in close proximity (<1km) i.e. the Yellow River area.	Construction & Operational	Yes

Ref no:	Topic	Sub-Topic	Mitigation Measure	Phase	Monitoring
13.9	Operational Phase Mitigation	Whooper Swans Protection	Areas and lengths of alignment proposed for marking with flight diverters are described as follows: • Between Towers 139 and 147 where the alignment passes to the east of Ballintra it is recommended that approximately 2.8km of the earth wires are marked with swan flight diverters; • Between Towers 160 and 169 where the alignment passes to the west of Lough Egish it is recommended that approximately 3.0km of the earth wires are marked with swan flight diverters; • Between Towers 196 and 203 in the vicinity of Comertagh and Raferagh Loughs, it is recommended that approximately 2.5km of the earth wires are marked with swan flight diverters; • Between Towers 257 to 268 near Cruicetown / Whitewood Lough; it is recommended that approximately 3.3km of the earth wires are marked with swan flight diverters; • Between Towers 279 and 283 west of Clooney Lough; it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters; • West of the Yellow River foraging area between Towers 291 and 295. The main identified flightline does not cross the alignment. However there is potential that Whooper Swan could move towards the area of the alignment. Given that high numbers occur in this area it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters; • Between Towers 307 and 312 at the River Blackwater crossing point it is recommended that approximately 1.6km of the earth wires are marked with swan flight diverters; and • between Towers 355 and 357 (including the River Boyne Crossing), 60cm diameter marker spheres will be added to the earth wire to increase visibility	Construction & Operational	Yes