

Proposed Larger Turbines and Met Masts at Authorised Upperchurch Windfarm

Whole Project Mitigation Measures, Monitoring Arrangements & Planning Conditions

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CHAPTER 14 Whole Project Mitigation Measures, Monitoring Arrangements & Planning Conditions

EIAR 14.1 Proposed Additional Mitigation Measures for the Proposed Larger turbines and Met Masts

The range of construction and operation stage mitigation measures set out in the Upperchurch Windfarm EIS 2013 and RFI 2013 and the environmental protection measures and monitoring arrangements which form part of the planning conditions attached to the Grant of Permission for Upperchurch Windfarm will be implemented for the proposed larger turbines and met masts. The Upperchurch Windfarm mitigation measures, monitoring arrangements and planning conditions are described in Section EIAR 14.2.

With the exception of the additional mitigation measures described below, all of the mitigation measures and monitoring arrangements which were proposed in 2013 as part of the original Upperchurch Windfarm application will be implemented for the Proposed Larger Turbines and Met Masts.

EIAR 14.1.1 Additional mitigation measure for Leisler's bat on Upperchurch Windfarm

2013 EIS/RFI Mitigation Measure: To minimise risk to bat populations a 50 m buffer will be maintained around any feature (trees, hedges) into which no part of the turbine intrudes. No turbine blade tip is within 50m buffer of bat habitat features (trees, hedge). Hedgerows in proximity to be removed to maintain this buffer. Use of white lights on top of the turbines will be avoided, and pre and post construction monitoring of bats along with fatality searches will be carried out.

2021 Additional Mitigation Measures: While the proposed larger turbines will not result in an increased significance of impact to bats (evaluated as slight to moderate in the Upperchurch Windfarm EIS 2013, and remaining slight to moderate significance for the Proposed Larger Turbines), two additional mitigation measures are added to this Proposal in order to alleviate the slightly increased risk to the species of Leisler's bat in the windfarm area:

1. Reduce the rotational speed of the turbine blades when idling so they do not exceed 2RPM, in line with best practice. It is noted that this measure will not result in any loss of energy output produced by the turbine. (SNH, 2019). This mitigation measure has been shown to significantly reduce collision risk to bats (Arnett *et al.* 2011, 2013; SNH, 2019). The implementation of this measure will ensure that the significance of the residual impact to Leisler's bat will not be materially greater than the authorised impact.
2. Adoption of the SNH best practice guidance 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' (2019) during the construction, operation and decommissioning of the Upperchurch Windfarm. This includes post-construction monitoring using dogs to search for bat carcasses around the turbine locations.

EIAR 14.1.2 Additional Mitigation Measure for Shadow Flicker Occurrence

2013 EIS Mitigation Measure: Shadow Flicker occurrence will be logged in real-time, for the first two years of operation, to determine the actual shadow flicker duration at 6 no. neighbouring dwellings (identified in the EIS 2013) to ensure that the effect will not exceed 30 hours per annum. In the unlikely event that it is found that the 30 hours per annum limit will be exceeded, the offending turbine will be shut down during the time that it would cause the effect at the particular dwelling in question for the remaining part of that year.

2021 Additional Mitigation Measure: The promoter commits to the installation of Shadow Flicker Control Modules as a mitigation measure, to ensure that shadow flicker does not exceed the permitted levels of 30 hours per year or 30 minutes per day at dwellings, either from Upperchurch Windfarm alone, or cumulatively with Milestone Windfarm. Additionally, the promoter commits to set the Shadow Flicker Control Modules to eliminate shadow flicker completely at the relevant turbine(s) should a complaint regarding shadow flicker be received from a house within the study area. This will eliminate shadow flicker at the house in question.

EIAR 14.2 Mitigation, Monitoring and Planning Conditions for Upperchurch Windfarm

EIAR 14.2.1 Upperchurch Windfarm Mitigation Measure (WF-MM)

Upperchurch Windfarm Mitigation Measure (WF-MM)	
WF-MM-01	With exception of one stream crossing (250m to north of T4), no roads or turbine foundations occur within 50m of a watercourse. The stream crossing method statement will be designed in consultation with Inland Fisheries Ireland – South Eastern River Basin District and Shannon River Basin District prior to initiation of construction works
WF-MM-02	Where construction activities intercept the 50m hydrological buffer zone, the following mitigation will used to prevent any potential impacts: <ul style="list-style-type: none"> ▪ Construction activities in the hydrological buffer zones will be avoided during or after prolonged rainfall or an exceptional rainfall event. Work will cease entirely near watercourses when it is evident that pollution is likely to occur. ▪ Culverts will be installed at locations where land drains are intercepted and will be diverted into the clean water drains. The culverts will be designed to facilitate the large flows that may occur following intense or prolonged rainfall events.
WF-MM-03	Limestone or similar quality stone will be used to cap the new access road network and the upgraded existing roads.
WF-MM-04	All associated tree felling will be undertaken using good working practices as outlined by the Forest Service in their 'Forestry Harvesting and Environment Guidelines' (2000) and the 'Forestry and Water Quality Guidelines' (2000). Measures will include the protection of the riparian zones, installation of buffered drainage outfalls, installation of drains and silt traps as soon as possible once felling has been completed, and a regime of continued monitoring of silt traps and drainage outfalls will be implemented. All excess felled brush will be removed off site to avoid release and runoff of phosphorous into sensitive watercourses.
WF-MM-05	No construction activities will take place during or after prolonged rainfall or an exceptional rainfall event.
WF-MM-06	Culverts will be installed at locations where land drains are intercepted and designed to facilitate the large flows associated with intense or prolonged rainfall events.
WF-MM-07	Method statements for stream crossing, culverts and drainage will be developed in consultation with Inland Fisheries Ireland prior to initiation of construction works.
WF-MM-08	A continuous silt fence will be installed down slope from the works area where construction shall take place within 100m of a watercourse. This will act as a physical impediment to any material or run-off reaching the stream and will be installed prior to the commencement of site excavations for each section. Effective and adequate temporary silt fences will be erected on the watercourse side to trap sediment particles when work is taking place during a prolonged wet weather period or intense rainfall event. The silt fences will be inspected regularly to ensure that the integrity of the structure remains intact and fit for purpose throughout the construction phase of the proposal.
WF-MM-09	During the construction phase, excavations will be backfilled as soon as is possible to prevent any infiltration of potentially polluting compounds to the subsurface.
WF-MM-10	Any water ingress that may be encountered in the weathered bedrock / mineral subsoils during the construction phase will be intercepted by an interceptor drain and diverted to the constructed drainage system for pollution control attenuation prior to discharge. Any pumping or dewatering of

Upperchurch Windfarm Mitigation Measure (WF-MM)	
	excavations or the drainage system will be well planned and pumped water will be treated in the adequate settlement pond and silt trap. No freshly pumped water will be permitted to enter the existing drainage network directly or be pumped out onto adjacent habitat.
WF-MM-11	<p>A Concrete Control Procedure will be implemented, and will include the following measures:</p> <ul style="list-style-type: none"> ▪ Trucks that deliver concrete to site will be washed out at the supplier's facilities and not on site. ▪ The only cement washing that will need to occur on site is the hand washing of the chutes at the rear of the cement trucks after the cement has been deposited. ▪ A concrete washout area will be designated away from drains and watercourses for washing out the chutes; ▪ A designated trained operator experienced in working with concrete will be employed during the concrete pouring phase; ▪ Run-off from wind turbine foundation concrete pours shall not be permitted to enter the watercourses and shall be contained within the foundation excavations and designated areas that are suitably sited and designed; ▪ Large volumes of concrete water will be pumped into a skip to settle out; settled solids will be appropriately disposed of off-site. The total volume will be reduced by only permitting concrete chutes to be washed on site. ▪ Raw or uncured waste concrete / cementitious material will be disposed of by removal from the site; ▪ The amount of in-situ concreting required will be minimised and ready-mix suppliers will be used in preference to on-site batching;
WF-MM-12	A wheel wash area will be provided and the resultant waste water will be diverted to a siltation pond for settling out of solids.
WF-MM-13	During the construction phase, a self-contained portable toilet with an integrated waste holding tank will be used on site for toilet facilities. This will be maintained by the service contractor on a regular basis and will be removed from the site on completion of the construction phase.
WF-MM-14	Any introduced semi-natural (road building materials) or artificial (PVC piping, cement materials, electrical wiring etc.) will be taken off site at the end of the construction phase. Any accidental spillage of solid state introduced materials will be removed from the site.
WF-MM-15	Temporary facilities will be provided on the proposed site for construction traffic parking, temporary site offices and storage areas
WF-MM-16	<p>Materials, containers, stockpiles and waste, however temporary, will be stored at designated areas, as follows:</p> <ul style="list-style-type: none"> ▪ Away from drains and any watercourses or drains; ▪ Fuel oils etc. will be stored in a sheltered area well removed from aquatic zones • Under cover to prevent damage from the elements • In secure areas • Well away from moving plant, machinery and vehicles ▪ All containers will be stored upright and clearly labelled.
WF-MM-17	During the construction phase, excavation of the soils in the localised area around the turbine locations and new access roads will be kept to a minimum, to ensure minimal disturbance of the natural soil conditions.
WF-MM-18	All excavated earth materials will be either re-used in an environmentally appropriate and safe manner, e.g. used for landscaping, or removed from the development site at the end of the construction phase.
WF-MM-19	Drains will be established to effectively drain grounds prior to excavation or earthworks of each section of road. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability;

Upperchurch Windfarm Mitigation Measure (WF-MM)	
WF-MM-20	All site excavations and construction will be supervised by a suitably qualified engineer. The contractor's method statement will be reviewed and approved by a suitably qualified geotechnical engineer prior to site operations.
WF-MM-21	Vehicular movements will be restricted to the footprint of the development. This implies that machinery will be kept on the site roads and hardstanding areas and aside, from advancing excavations, avoid moving onto areas not delineated on the site drawing.
WF-MM-22	A suitably qualified ecologist will be engaged to oversee the Ecological Management Plan over the life time of the wind farm. All site actions and monitoring measures will be required to be undertaken by the developer and under the supervision of the ecologist to achieve the objectives of the plan.
WF-MM-23	In order to mitigate the loss of potential foraging habitat for hen harrier, due to the construction of the wind farm at Upperchurch, 128 Hectares of habitat will be management adjacent to the area of development to the benefit of hen harrier. The Upperchurch Hen Harrier Scheme will involve the planting, with native species, of approximately 2.8km of new hedgerows. This habitat management will be implemented and management through the Upperchurch Hen Harrier Scheme which will form part of the Ecological Management Plan.
WF-MM-24	The layout of Upperchurch Windfarm has been designed to ensure that there is a sufficient buffer between windfarm infrastructure and the natural watercourses and streams within the study area. The layout of the turbines and the route of the access roads was also based on the results of site investigations, and for the most part the turbines and roads have been located on the least ecologically sensitive areas found during the investigations.
WF-MM-25	Replanting 360m of new hedgerow. Existing hedgerows in poor condition will be planted with native species to increase their ecological value. The location of new hedgerow shall be identified by the project ecologist prior to construction. Native species will be replanted within the proposed new hedgerows. Success of establishment will be monitored in early operational phase. Existing hedgerows in poor condition will be planted with native species to increase their ecological value.
WF-MM-26	As a result of permanent felling works areas surrounding the windfarm infrastructure will be bare - these areas will be incorporated into an Ecological Management Plan for the site.
WF-MM-27	Areas of existing conifer plantation will require permanent felling, in order to accommodate wind farm infrastructure and the erection of turbines. A large part of the felled area will not be required to accommodate the elements of wind farm infrastructure. This area will be allowed to naturally regenerate and be managed for nature conservation purposes. The main aim is to restore the conditions that allow wet heath, upland blanket bog, wet grassland and scrub vegetation to recover on these felled areas, within the site. In the event that the natural establishment of vegetation is slow, it is proposed to harvest seeds from purple-moor grass (<i>Molinia caerulea</i>) and other suitable species from a suitable location outside the site, and plant them within the bare felled areas.
WF-MM-28	Exposed areas of the site that are slow to re-vegetate will be replanted with suitable vegetation. This will be decided by the developer in consultation with the project ecologist near the end of the construction phase
WF-MM-29	The different tree felling methods will have an influence on the success of the restoration, and felling be undertaken, with prior consultation with the project ecologist. Restoration will be achieved by the felling of conifer trees and blocking selected drains, to locally increase the water table.
WF-MM-30	The following measures are designed to reduce the predicted impacts on bird populations: <ul style="list-style-type: none"> ▪ Pre-construction monitoring will be undertaken within the site, and will continue during the construction phase. ▪ Vegetation clearance, including the felling of trees, scrub and hedgerow, will be undertaken outside the breeding bird period (1st March to the 31st of August). ▪ Work will begin before the breeding season begins to ensure that incubating birds or birds with young are not displaced by work commencing during the breeding season. ▪ Damage to or loss of trees will be kept to a minimum, during the construction phase.

Upperchurch Windfarm Mitigation Measure (WF-MM)	
	<ul style="list-style-type: none"> ▪ Machinery will be kept on roads and hardstanding areas, and aside from advancing roads, will not move onto habitats beyond the proposed development footprint, in order to prevent unnecessary damage or disturbance.
WF-MM-31	Intermittent lighting is less likely to cause species to collide with turbines. The use of “white lights” on the turbines will be avoided. Any form of lighting on the turbines or other structures will have to be agreed in advance with the Irish Aviation Authority.
WF-MM-32	To minimise risk to bat populations a 50 m buffer will be maintained around any feature (trees, hedges) into which no part of the turbine intrudes. No turbine blade tip is within 50m buffer of bat habitat features (trees, hedge). Hedgerows in proximity to be removed to maintain this buffer. The amount of hedgerow removal required will be identified by the project ecologist prior to construction.
WF-MM-33	Native species (including hawthorn, blackthorn, hazel and oak) will be planted within new hedgerows to increase their value as foraging habitat to bats. Native species offer higher quality habitat for invertebrates the main prey item for bat species. All planting and hedgerow reinstatement will be carried out following the guidelines and recommended methodology reference in Knowles, (1995) and JNCC, (2001). Gaps within existing hedgerows shall be planted with native species to encourage the use of hedgerows as flight paths.
WF-MM-34	Bat boxes shall be erected within the study area, at suitable locations deemed favourable, as a result of the pre- and post-construction bat surveys.
WF-MM-35	No works to bridges along haulage routes are required. However, the following measure is included in the Ecological Management Plan (2013): If any local bridge is to be strengthened, prior to use for haulage of construction materials for this development, it shall first be surveyed for bat presence, prior to any upgrading or maintenance works. Any maintenance or upgrading works, including pressure grouting or re-pointing of bridges, shall only proceed after an inspection of the structure for potential bat roosts, and will be in accordance with best practice guidelines and statutory procedures, (see National Roads Authority 2006a/2006b).
WF-MM-36	No mature trees require felling along haulage routes. However, the following measure is included in the Ecological Management Plan (2013): Mature trees that require felling should along haulage routes should also be surveyed for potential bat roosts bats. Any mitigation measures carried out to mitigate the potential impact to bats along haulage routes will be conducted under the terms of an appropriate NPWS wildlife derogation licence.
WF-MM-37	<p>Pre and post construction monitoring of badger activity within the site will be carried out as part of the management of the site, implemented through the ecological management plan. Construction shall also be limited to the footprint of the windfarm development and the planning boundary thus maintaining the existing buffer between the windfarm development and the old setts recorded during the survey.</p> <p>If a new badger sett is discovered during construction works particularly vegetation clearance. Works shall be suspending within 50m of any newly discovered badger sett during the breeding season (December to June inclusive) and 30m outside the breeding season (July to November inclusive) pending an activity survey, consultation with the local NPWS Wildlife Ranger and receipt of a badger derogation licence.</p>
WF-MM-38	A number of number of suitable settlement ponds are kept in situ once construction has been completed. These ponds will be modified to provide optimum habitat for dragonfly and damselfly species and other insects, birds and amphibians. Health and safety issues will have to be taken into consideration with fencing and signs recommended to alert people to potential dangers. The settlement ponds will be modified to have very gently sloping sides, providing extensive areas of very shallow water. If the pond is large enough, it will have a deep central area at least 1-1.5 m deep.
WF-MM-39	An Environmental Monitoring Committee will be established for the construction phase of the Upperchurch Windfarm. The Committee shall include representatives of the developer, North Tipperary County Council, Inland Fisheries Ireland, the project Ecologist, and representatives of the local community. Monthly meetings will be held and issues such as project progress, works planned

Upperchurch Windfarm Mitigation Measure (WF-MM)	
	for the month ahead, e.g. scheduled concrete pours of bases, results of construction noise monitoring, traffic or haulage schedules and any community issues or queries will be discussed.
WF-MM-40	To minimise the concentration of dust generated during construction of the development, the following measures will be implemented: the selection of construction materials for the onsite road network so as to ensure that particles are not blown around the site, this includes the use of aggregate of not less than 5mm grade and to also ensure that surface dressing be compressed quickly. In addition to reduce impacts on air quality concrete brought to the site will be poured directly, haulage trucks will not be over filled and also that site machinery and vehicles onsite will not be left running unnecessarily.
WF-MM-41	Construction phase noise: Best practice in the form of BS5228 –1&2:2009, Code of Practice for the Control of Noise and Vibration on Construction and Open Sites should be adopted during the construction phase in order to minimise the noise generated by construction activities and nuisance to neighbours.
WF-MM-42	No blasting will occur during the construction of the Upperchurch Wind Farm
WF-MM-43	Noise reduced control modules will be installed in the turbines and will be used where necessary to reduce noise emissions in order to ensure that the permitted noise levels are not exceeded during the operation of the windfarm.
WF-MM-44	Shadow Flicker occurrence will be logged in real-time, for the first two years of operation, to determine the actual shadow flicker duration at 6 no. neighbouring dwellings (<i>identified in the EIS 2013</i>) to ensure that the effect will not exceed 30 hours per annum. In the unlikely event that it is found that the 30 hours per annum limit will be exceeded, the offending turbine will be shut down during the time that it would cause the effect at the particular dwelling in question for the remaining part of that year.
WF-MM-45	Cultural Heritage: Due to the possibility of the survival of sub-surface archaeological deposits or finds within the development area, it is recommended that all groundworks associated with the proposed development be archaeologically monitored under licence to the National Monuments Service.
WF-MM-46	Cultural Heritage: It is recommended that a buffer-zone where development is precluded, be instituted around the Recorded Monument in the proposed development area. This should measure a minimum of 30m around the site. In addition no site offices, depots or storage facilities should be placed within these buffer zone.
WF-MM-47	Detailed pre-construction condition survey with county council engineer - Identify those sections of road which may require strengthening or realignment and as a basis for agreeing remedial works to be carried out by the developer with North Tipperary County Council on completion of the project.
WF-MM-48	Site Entrance No. 1 will be designed so that the component delivery trucks will be able to completely clear the R503 before they reach the gates of the construction site. This entrance will be closed on completion of the construction phase and will only be used during the operational phase in the case of a necessary replacement of a major component or for decommissioning the windfarm. The other entrances from the local roads throughout the site will be used for operation and maintenance traffic, which will mainly be four wheel drive vehicles and vans.
WF-MM-49	In the interest of road safety during the construction stage, measures regarding traffic control will be implemented. In order to mitigate for increased road usage, deliveries of heavy equipment or oversized loads to the site will be timed to cause minimal disturbances to the residents and users of the local roads. Road authorities will also be informed of the planned road use, and transportation of oversized loads will be co-ordinated with the local authorities and Garda.
WF-MM-50	The promoter will at all times ensure that inconvenience to local people is minimised and will schedule traffic flow to achieve this.
WF-MM-51	Provision of a Relay Site at the windfarm to realign any affected telecommunication links around the wind turbines. (<i>Note: this mitigation measures was later developed as the UWF Related Works Telecoms Relay Pole</i>).
WF-MM-52	Landscape & Visual Impact - turbines: Matt non-reflective finishes will be used on all turbine components;

Upperchurch Windfarm Mitigation Measure (WF-MM)	
	<ul style="list-style-type: none"> ▪ Transmission lines between individual turbines and the substation will be placed underground; ▪ Counter rotation of blade sets will be avoided; ▪ The number and extent of new access tracks will be kept to a minimum and properly landscaped immediately following completion of works. Such landscaping will include reinstating original vegetation along verges and repairing any wheel ruts; ▪ Special care will be taken to preserve any features, which contribute to the landscape character of the study area. Any damage to existing hedgerows from transporting the turbines will be rectified; and ▪ Turbines will be the same size as existing turbines in the area
WF-MM-53	Landscape & Visual Impact – windfarm substation: A high standard of design will be applied to all structures associated with the substation considering not only its function but also the aesthetic quality, in order to minimise any sense of intrusion. The proposed development will provide colour harmony and adequate screening of the substation using berms covered with scrub and ground vegetation in order to mitigate its impact.

EIAR 14.2.2 Upperchurch Windfarm Management Plans (WF-Plan)

Upperchurch Windfarm Management Plans (WF-Plan)	
WF-Plan	<p>Upperchurch Windfarm Environmental Management Plan 2021: An updated Environmental Management Plan (EMP) which includes the Proposed larger Turbines and Met Masts amendment accompanies this planning application.</p> <p>The updated <i>Upperchurch Windfarm Environmental Management Plan 2021</i> is based on the original Preliminary Environmental Management Plan for Upperchurch Windfarm (Malachy Walsh & Partners, 2013) and describes the approach to environmental management during the construction and operational stages of the windfarm. The purpose of the EMP is to communicate environmental protection measures that apply to the development of the Upperchurch Windfarm to those with responsibility for carrying out works on site so that any likely significant adverse effects of the development on the receiving environment can be prevented.</p> <p>An Environmental Clerk of Works will be appointed and it will be their responsibility to ensure that the EMP is implemented through liaising with the Construction Site Manager and the Project Manager and by carrying out weekly audits on EMP compliance. The EMP will be an important contract document for the main construction contractor (Contractor) who will be contractually obliged to comply with the EMP and the requirements of the Environmental Clerk of Works.</p>
WF-Plan	<p>Fuel Management Plan: This plan will incorporate the following elements:</p> <ul style="list-style-type: none"> ▪ Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from drains and open water; ▪ Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores; ▪ Ancillary equipment such as hoses and 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; ▪ Fuelling and lubrication of equipment will be carried out in bunded areas.

Upperchurch Windfarm Management Plans (WF-Plan)	
	<ul style="list-style-type: none"> ▪ Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling ▪ Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of. ▪ Procedures and contingency plans will be set up to deal with emergency accidents or spills; ▪ An emergency spill kit with oil boom, absorbers etc. is to be kept on site for use in the event of an accidental spill. ▪ Prior to any work it will be ensured that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease. ▪ Overnight parking of vehicles away from watercourses
WF-Plan	<p>Sediment and Erosion Control Plan will be implemented to prevent sediment and pollutant runoff into the local watercourses during the construction phase. The plan includes the following elements:</p> <ul style="list-style-type: none"> ▪ The plan will effectively consist of restoring and maintaining the existing drainage network and upgrading it as per new drainage details as required on site along the existing access tracks and roads where it exists and integrating it with newly constructed drainage required for upgraded and new roads. ▪ The Plan will implement sediment control measures that ensure the separation of clean and 'dirty' water. ▪ Constructed Drainage will be designed in accordance with the Sediment and Erosion Control Drawings. ▪ No work will take place within 50m buffer zones of live watercourses, except at crossings. ▪ All construction method statements will be prepared in consultation with Inland Fisheries Ireland – South Eastern River Basin District and Shannon River Basin District. ▪ The area of exposed ground will be kept to a minimum by maintaining, where possible, existing vegetation. ▪ Temporary deposition areas will be designated and designed to hold temporary stockpiles and will be located away from drains and watercourses. ▪ Stockpiles that are at risk of erosion will be protected by silt trapping apparatus such as a geo-textile silt fence to prevent contaminated runoff. ▪ Appropriate silt control measures, such as silt fences, silt traps, check dams and sedimentation ponds, will be installed where there is a risk of erosion runoff to watercourses from construction related activity, particularly during prolonged wet weather periods or following an intense rainfall event. ▪ Controls will be regularly inspected and maintained. Controls must work well until the vegetation has re-established; inspect and maintenance is critical after prolonged or intense rainfall. ▪ Run-off from wind turbine foundations will not be permitted to enter the drainage system and will be contained within the foundation excavations and designated areas that are suitably sited and designed; ▪ The silt retention measures where they are installed will be inspected and maintained on a regular basis throughout the construction and operation phases of the wind farm. ▪ All associated tree felling will be undertaken using good working practices as outlined by the Forest Service in their 'Forestry Harvesting and Environment Guidelines' (Forest Service, 2000a) and the 'Forestry and Water Quality Guidelines' (Forest Service, 2000b). The latter guidelines deal with sensitive areas, erosion, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. ▪ Drainage ditches or other suitable measures will be adopted alongside access roads, turbines and other disturbed areas to prevent silt or contamination from construction water runoff entering watercourses. ▪ Check dams will be placed at regular intervals based on slope gradient along all drains to slow down runoff so as to encourage settlement and to reduce scour and ditch erosion.

Upperchurch Windfarm Management Plans (WF-Plan)	
	<ul style="list-style-type: none"> ▪ Drains carrying construction site runoff will be diverted into silt traps. ▪ Wheel washes will be provided for exiting heavy vehicles to ensure roads outside of the site boundary are clean. ▪ Pumped or tremmied concrete will be monitored carefully to ensure no accidental discharge into local watercourses. ▪ Public road cleaning will be carried out, particularly in the vicinity of drains. ▪ A programme of inspection and maintenance of drainage and sediment control measures during construction will be designed and dedicated construction personnel assigned to manage this programme. ▪ Water quality monitoring will be carried out in years 1 and 2 of operation to determine whether water quality has been impacted. Monitoring of water quality parameters will be conducted monthly in Year 1. If thresholds are not exceeded in Year 1, then the effort may be reduced in Year 2.
WF-PLAN	<p>Traffic Management Plan which will describe measures for the management of all traffic, including construction traffic and oversized loads, for the minimisation of disturbance and nuisance to the local community. This Plan will include:</p> <ul style="list-style-type: none"> ▪ Provision for communicating with the community, the Gardaí and the Local Authority. ▪ Details of site access and any site traffic rules, including security, parking, loading and unloading, required speed or other relevant details. ▪ Details of the turbine component delivery and any road closures etc. ▪ Programme of maintenance and upkeep of public roads. ▪ Site operating hours (including delivery).
WF-PLAN	<p>Waste Management Plan: The Contractor will prepare a Waste Management Plan, and will engage a waste company to deal with all its wastes during construction, so all waste streams should be identified at the outset and a selection of skips and bins are delivered to the contractor's compound at the outset and the waste is then managed throughout the construction phase.</p>
WF-PLAN	<p>Post Construction Site Reinstatement Plan will describe measures for the reinstatement of the site upon completion of the construction works (not the decommissioning and aftercare at end of project life), and will include:</p> <ul style="list-style-type: none"> ▪ Removal of the two temporary compounds ▪ Reinstatement and landscaping of the two temporary compound hardstands ▪ Details of landscaping and use of spoil ▪ Reinstatement of road verges (use of soil) ▪ Reinstatement of any temporary construction hardstands ▪ Reinstatement of the site borrow pits ▪ Natural re-vegetation policy ▪ Monitoring and assessment of re-vegetation and recovery success ▪ planting of new hedgerows is included in the Ecological Management Plan and may also be included as part of the post-construction reinstatement works, and ▪ Exposed areas of the site that are slow to re-vegetate will be replanted with suitable vegetation – in consultation with the Project Ecologist ▪ Monitoring and assessment of re-vegetation and recovery success (Project Ecologist).
WF-PLAN	<p>An Ecological Management Plan (EMP) will be developed prior to construction to provide a framework for the conservation and enhancement of valuable features within the site. The main emphasis of the programme of works will be on monitoring the impacts, if any, to the local aquatic ecology. Hence, the mitigation outlined above will be co-ordinated as part of the EMP. These are:</p> <ul style="list-style-type: none"> ▪ Water Quality Measures ▪ Routine inspection and maintenance of sediment and erosion measures

Upperchurch Windfarm Management Plans (WF-Plan)	
	<ul style="list-style-type: none"> ▪ Water quality monitoring for years 1 and 2 of operation. Monitoring of water quality parameters will be conducted monthly in Year 1. If thresholds are not exceeded in Year 1, then the effort may be reduced in Year 2. ▪ A number of suitable sediment ponds will be retained in situ and may require modification to enhance the suitability of the site for invertebrates. ▪ The removal of excess brash and trees off site and disposal at an appropriate location to minimise nutrient leaching to the soil. ▪ The allowance for the natural establishment of wet grassland, scrub and possibly wet heath vegetation within the proposed site. ▪ Where natural establishment of vegetation is slow, purple-moor grass (<i>Molinia caerulea</i>) and other suitable species should be planted within the bare felled areas.
WF-PLAN	<p>Invasive Species Management Plan</p> <p>It is important to note that there are currently no invasive plant infestations within the Upperchurch Windfarm boundary and as such construction or operational stage risks from Invasive plant infestations are not present. However, the Promoter, Ecopower Developments Ltd, is committed to implementing best practice Biosecurity Measures for all works and activities relating to the Upperchurch Windfarm project.</p>

EIA 14.2.3 Upperchurch Windfarm Monitoring Arrangement (WF-MA)

Upperchurch Windfarm Monitoring Arrangement (WF-MA)	
WF-MA-01	Pre-construction public road condition survey
WF-MA-02	Pre-felling bird survey to be carried out to ensure that potential nesting birds are not impacted if felling is carried out within the breeding bird season (April to July).
WF-MA-03	Pre-Construction Breeding Bird Surveys.
WF-MA-04	Pre-construction Bat Surveys
WF-MA-05	Pre-construction terrestrial mammal surveys, particularly, for badger, to determine whether the sett layout that was encountered, has altered
WF-MA-06	Water quality monitoring will take place during the construction phase of the Upperchurch Windfarm. Water quality in the streams and outflow from end points of the drainage system will be monitored by sampling and testing on a regular basis during different weather conditions. This monitoring along with the visual monitoring outlined below will help to ensure that the mitigation measures that are in place to protect water quality are working. The scope of this monitoring will be developed in consultation with Inland Fisheries Ireland.
WF-MA-07	Daily Checks of Sediment & Erosion Controls during the construction phase
WF-MA-08	Weekly Site Audit - Fuel & Oil Storage inspection
WF-MA-09	Weekly Site Audit - Material and Waste Storage
WF-MA-10	Archaeological Monitoring during construction
WF-MA-11	Construction Noise Monitoring - Noise monitoring will be undertaken during the construction phase to ensure any limits set down by the planning authority are complied with.
WF-MA-12	Water Quality - Q-Sampling during Years 1 and 2
WF-MA-13	Monitoring Concrete Pours
WF-MA-14	Routine inspection and maintenance of constructed drainage and of the sediment and erosion control measures will take place regularly during the operational life of the project.
WF-MA-15	A Water Quality Monitoring Programme will be implemented. Monitoring will be carried out in years 1 and 2 of operation to determine if water quality has been impacted. Monitoring of water quality parameters will be conducted monthly in Year 1. If thresholds are not exceeded in Year 1, then the effort may be reduced in Year 2. The scope of this monitoring will be developed in consultation with Inland Fisheries Ireland. Water sampling will include biological water quality analysis - Q sampling; and physio-chemical water quality analysis.
WF-MA-16	<p>Post-Construction Bird Surveys for 3 years – comprising</p> <ul style="list-style-type: none"> ▪ Vantage point surveys ▪ Use of the hen harrier habitat area (Upperchurch Hen Harrier Scheme area) ▪ Transect surveys, and ▪ Fatality searches. <p>The full scope and timing of these surveys will be in consultation with NPWS prior to the completion of the construction phase</p>
WF-MA-17	Post-Construction Badger Surveys Years 1 to 3
WF-MA-18	Post-Construction Bat Surveys Years 1 to 3, including fatality searches
WF-MA-19	Post-Construction Fatality Survey
WF-MA-20	Hen Harrier Habitat Monitoring – Annually Years 1 to 5
WF-MA-21	Vegetation Monitoring: The process of blanket bog and wet heath establishment, as well as the establishment of wet grassland, scrub and wet heath areas within the felled areas, will be monitored by setting up a number of permanent vegetation monitoring quadrats. These will be surveyed during years 1, 2, 3 and 5. At the end of the 5-year vegetation monitoring, the data will be analysed and long-term monitoring or management will be proposed, if necessary.

Upperchurch Windfarm Monitoring Arrangement (WF-MA)

WF-MA-22	Habitat Monitoring: Site visits by an appointed ecologist will be made to Upperchurch Wind Farm during the same years as the vegetation monitoring, in order to assess the status of the habitats at the site and whether any adjustment of the management plan is necessary
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EIAR 14.2.4 Authorised Upperchurch Windfarm Conditions of Planning (Ref. 22.243040)

Condition 1: The development shall be carried out and completed in accordance with the plans and particulars lodged with the application, as amended by the further plans and particulars lodged with the application, as amended by the further plans and particulars submitted to the planning authority on the 27th day of November, 2013, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development and the development shall be carried out and completed in accordance with the agreed particulars.

Condition 2: All environmental mitigation measures set out in the Environmental Impact Statement, Natura Impact Statement and associated documentation submitted by the applicant to the planning authority and An Bord Pleanála, shall be implemented in full, except as may otherwise be required in order to comply with the following conditions.

Condition 3: The period during which the development hereby permitted may be carried out shall be ten years from the date of this Order

Condition 4: The permission shall be for a period of 25 years from the date of the commissioning of the wind turbines. The wind turbines and related ancillary structures shall then be decommissioned and removed unless, prior to the end of the period, planning permission shall have been granted for their retention for a further period.

Condition 5: This permission shall not be construed as any form of consent or agreement to a connection to the national grid or to the routing or nature of any such connection

Condition 6: Prior to commencement of construction, details of the phasing of the construction works shall be agreed in writing with the planning authority, following consultation with the National Parks and Wildlife Service.

Condition 7: (a) The wind turbines including masts and blades, and the wind monitoring mast, shall be finished externally in a light grey colour.

(b) Cables within the site shall be laid underground

(c) The wind turbines shall be geared to ensure that the blades rotate in the same direction

(d) No advertising material shall be placed on, or otherwise be affixed to, any structure on the site without a prior grant of planning permission.

Condition 8: Details of the materials, colours and textures of all the external finishes to the proposed building shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 9: The proposed wind turbines erected on the site shall not exceed an overall height to 126.6 metres and a hub height of 81.6 metres.

Condition 10: The proposed construction works on the site shall be carried out in accordance with construction details submitted to the planning authority on the 7th day of January, 2013 and as further

amended on the 27th day of November, 2013, including the Construction Management Plan, and the mitigation measures contained therein.

Condition 11: Wind turbine noise arising from the proposed development, by itself or in combination with other existing or permitted wind energy development in the vicinity, shall not exceed the greater of:-

(a) 5 dB(A) above background noise levels or

(b) 43 dB(A)L90, 10 min when measured externally at dwellings or other sensitive receptors.

Prior to commencement of development, the developer shall submit to and agree in writing with the planning authority a noise compliance monitoring programme for the subject development. All noise measurements shall be carried out in accordance with ISO Recommendation R 1996 "Assessment of Noise with Respect to Community Response," as amended by ISO Recommendations R 1996-1. The results of the initial noise compliance monitoring shall be submitted to, and agreed in writing with, the planning authority within six months of commissioning of the wind farm.

Condition 12: (a) The proposed development shall be fitted with appropriate equipment and software to suitably control shadow flicker at nearby dwellings, in accordance with details which shall be submitted to, and agreed in writing with, the planning authority prior to the commencement of development.

(b) Shadow flicker arising from the proposed development, by itself or in combination with other existing or permitted wind energy development in the vicinity, shall not exceed 30 hours per year or 30 minutes per day at dwellings that are existing or permitted or at other sensitive receptors.

(c) A report shall be prepared by a suitably qualified person in accordance with the requirements of the planning authority, indicating compliance with the above shadow flicker requirements at dwellings. Within 12 months of commissioning of the proposed wind farm, this report shall be submitted to, and agreed in writing with, the planning authority.

Condition 13: In the event that the proposed development causes interference with telecommunications signals, effective measures shall be introduced to minimise interference with telecommunications signals in the area. Details of these measures, which shall be at the developer's expense, shall be submitted to, and agreed in writing with, the planning authority following consultation with the relevant authorities.

Condition 14: Details of aeronautical requirements shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development, following consultation with the Irish Aviation Authority. Prior to commissioning of the turbines, the developer shall inform the planning authority and the Irish Aviation Authority of the as-constructed tip heights and co-ordinates of the turbines and wind monitoring mast.

Condition 15: The management of drainage and surface water during the construction stage of the development shall be in accordance with the details submitted in the Construction Management Plan, the Ecological Management Plan and Environmental Management Plan. Furthermore:

- (a) all oils and fuels shall be stored in an area bunded to 110% of the total volume of stored oils and fuels
- (b) re-fuelling or machine servicing shall take place only within designated impermeable bunded areas, which shall be drained through an oil interceptor,
- (c) a wheel wash shall be provided within the site, near the entrance to the public road, and
- (d) an appropriately sized facility shall be provided on site for concrete washings.

(e) Revised drawings showing compliance with these requirements shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 16: There shall be no new provision for discharge of foul effluent on site without a prior grant of planning permission

Condition 17: Prior to the carrying out of any construction works between mid-march and mid-August, a survey for breeding hen harriers shall be carried out by a competent, experienced ornithologist. The survey will cover the area within 500 metres of the works to be carried out during the above period. It will be the responsibility of the ornithologist to ensure that the survey methodology is sufficient to ensure that a hen harrier breeding site is not overlooked. Taking into account the results of this survey, no construction works shall be carried out within the above period within 500 metres of a pre-nesting breeding site and/or nest, except with the written approval of the National Parks and Wildlife Service.

Condition 18: (a) the Ecological Management Plan submitted to the planning authority on the 27th day of November, 2013, shall be implemented in full. Details including timescale, and monitoring shall be agreed with the planning authority following consultation with the National parks and Wildlife service.

(b) A timescale for the provision of the enhanced foraging areas including rush managements, the provision of additional hedgerows enclosures for native scrub and trees and measures by landowners in relation to spreading, burning, interference with drainage, retention of hedgerows, restrictions on use of poisons and new forestry plantation shall be agreed with the planning authority following consultation with the National parks and Wildlife service.

(c) a programme of ongoing surveys and monitoring of the species in years 2 and 3 after the commencement of the operation of the turbines shall be submitted to, and agreed in writing with the planning authority, following consultation with the National parks, and prior to the commencement of development works on the site.

Condition 19: Details relating to the protection of other species including bats and badgers as outlined in the Ecological Management Plan submitted to the planning authority on the 27th day of November, 2013, shall be implemented. A timescale for the implementation of the measures outlined shall be submitted to, and agreed in writing with, the planning authority prior to the commencement of development works on the site and following consultation with the National Parks and Wildlife Service.

Condition 20: The developer shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the developer shall:

(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and

(b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works. The assessment shall address the following issues:

(i) the nature and location of archaeological material on the site, and

(ii) the impact of the proposed development on such archaeological material. A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority

details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works. In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination

Condition 21: (a) Mitigation measures outlined in the Environmental Impact Statement, Natura Impact Statement and other documentation submitted to the planning authority for the protection of water quality shall be implemented in full and according to best practice guidelines. The works shall be supervised as set out in the Construction Management Plan. In the event of a water pollution incident or damage to a receiving watercourse, the relevant statutory authorities shall be immediately notified and works cease until authorized to continue by the planning authority.

(b) A programme of hydrographic monitoring after rainfall events shall be carried out at the applicant's expense over a period commencing pre-construction and concluding in year 3 of the operational phase of the proposed development. The results of the monitoring and reports arising shall be made available to the planning authority, Fisheries Ireland and the National Parks and wildlife Service.

Condition 22: On full or partial decommissioning of the wind farm, or if the wind farm ceases operation for a period of more than one year, the wind monitoring mast, the turbines concerned and all decommissioned structures and equipment shall be removed, and foundations removed or covered with soil to facilitate re-vegetation, all to be completed to the written satisfaction of the planning authority within three months of decommissioning or cessation of operation

Condition 23: Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the reinstatement of public roads that may be damaged by the transport of materials to the site, coupled with an agreement empowering the planning authority to apply such security or part thereof to the satisfactory reinstatement of the public road. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Condition 24: Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the satisfactory reinstatement of the site upon cessation of the project, coupled with an agreement empowering the planning authority to apply such security or part thereof to such reinstatement. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Condition 25: The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefitting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to An Bord Pleanála to determine the proper application of the terms of the Scheme.

EIAR 14.2.5 Authorised amendments to the Upperchurch Windfarm Electrical Substation (Ref. 20/1048)

Condition 1: Save where modified by the following conditions, the proposed development shall be carried out and completed in accordance with the permission granted under PL Ref. 13/510003 (ABP Ref. PL.22.243040) save as modified by the drawings and documentation submitted with the planning application on 16/09/2020

Condition 2: During development works, the developer shall ensure that material from the site is not spread or deposited on the public roadway and shall maintain the roadway in a clean, tidy and safe condition. In addition, appropriate advance warning signs shall be erected, in accordance with proposals, which shall have the prior written consent of the Planning Authority.

EIAR 14.3 Mitigation, Monitoring and Planning Conditions for UWF Related Works

EIAR 14.3.1 UWF Related Works Project Design Measure (RW-PD)

UWF Related Works Project Design Measure (RW-PD)	
RW-PD-01	All construction works will be carried out during daylight hours.
RW-PD-02	Flag-men will be used at temporary site entrances rather than creating sightlines by the removal of roadside boundaries. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the local road network in a safe and efficient manner.
RW-PD-03	Construction works in Knocknabansha, Knockmaroe, Knockcurraghbola Crownlands and Knockcurraghbola Commons townlands, which are within 350m of local residences, will not take place at the same time as either the UWF Grid Connection or Upperchurch Windfarm.
RW-PD-04	Confirmatory consultations with Irish Water, Eir and ESB and confirmatory ground surveys at service locations will be carried out ahead of works; 'Goal Posts' will be used to identify and highlight the height of nearby overhead lines; and a foreman will look out for underground pipes during excavations near services.
RW-PD-05	Land reinstatement will not be carried out during very wet weather or when the soil is waterlogged.
RW-PD-06	If any compaction has occurred along the construction works area, these areas will be ploughed with a sub-soiler to loosen the subsoil layer
RW-PD-07	Construction traffic will be restricted to the construction works area and tracking across adjacent ground will not be permitted
RW-PD-08	All initial groundworks will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works. Where excavations occur in areas of archaeological potential such as fording points and associated marsh lands and watercourses all excavated material will be spread out and metal detected (under licence to National Monuments Service) as part of the finds retrieval strategy.
RW-PD-09	New permanent access roads (Realigned Windfarm Roads) will have a permanent surface water drainage network in place which will include check dams. These check dams will settle suspended solids in water runoff while also slowing down the rate of water run-off from these areas.
RW-PD-10	Only precast concrete culverts or structures will be used at watercourse crossing locations. No batching of wet cement will take place on-site.
RW-PD-11	Instream construction works will be followed by site-specific reinstatement measures to ensure the restoration of flow character and morphology within the affected reach. Measures will include: bank stabilisation using boulder armour or willow/brush bank protection; reinstatement of bank slope and character, creation of compound channels where necessary; reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and planting along the riparian margin to stabilise banks, add flood protection and provide riparian buffer.
RW-PD-12	A phased approach will be undertaken in relation to watercourse crossing works, earthworks, forestry felling and excavation dewatering, where these works occur within 50m of a Class 1 or Class 2 watercourse. The phased approach will only permit one of main potential sediment producing activities, listed above, to be carried out within 50m of a Class 1 or Class 2 watercourse, at any one time.
RW-PD-13	All excavated material will be removed for temporary or permanent storage at a suitable location more than 50m away from all other Class 1 and Class 2 watercourses. Spoil excavations from public roads being transported to landfill will be covered during transport.
RW-PD-14	Temporary silt control methods such as silt fencing or containment berms will be placed around all overburden storage areas.
RW-PD-15	Permanent overburden storage berms will be graded and seeded immediately after emplacement.

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RW-PD-16	For works within 50m of a Class 1 or Class 2 watercourse, additional mitigation measures include double silt fencing, temporary drain blocking, placement of straw bale arrangements along preferential surface water flowpaths and, where necessary, the use of matting to prevent ground erosion and rutting.
RW-PD-17	Where dewatering of trenches or excavations is required, there will be no direct discharge of treated water into any watercourse or drain. Rather all pumped water will be treated prior to discharge using an infiltration trench or settlement pond or suitable water treatment train such as a Siltbuster, as appropriate.
RW-PD-18	There will be no refuelling of vehicles or plant permitted within 100m of a watercourse
RW-PD-19	The main fuel stocks for, and chemical wastes arising from, construction activities will be stored in a designated location, away from main traffic activity, within the temporary compound (Consented Upperchurch Windfarm Site Compound No.1). All fuel will be stored in bunded, locked storage containers.
RW-PD-20	Overnight parking of plant and machinery will only be permitted at locations which are greater than 50m from watercourses and where there is an existing hard-core surface in place.
RW-PD-21	No refuelling of plant or equipment will be permitted within 100m of identified wells
RW-PD-22	In-stream works at Class 1 and Class 2 watercourses will only be undertaken during the IFI specified period (July, August and September) and will be carried out to best practice (IFI, 2016).
RW-PD-23	In-stream works will not be undertaken without isolation of flow within the watercourse, any fish within the isolated section will be removed using electrofishing and, following collection of biometrics, transferred immediately downstream of the crossing point and placed back in the water. The water will then be isolated from the works by over pumping, flume (pipe) or channel diversion methods.
RW-PD-24	All new permanent watercourse culverts will be sized to cope with a minimum 100-year flood event. All pipe culverts will be a minimum of 900mm in diameter regardless of the anticipated flood flow.
RW-PD-25	All new permanent culverts on Class 1 and Class 2 type watercourses will be bottomless or clear spanning.
RW-PD-26	Confirmatory hen harrier breeding surveys will be completed, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the construction works area boundary. These surveys will be completed prior to the start-up of all construction activities, until construction is complete and for 3 years thereafter. No construction works for UWF Related Works will take place during the hen harrier breeding season (March to August).
RW-PD-27	During the hen harrier roosting season (October to February inclusive), construction works within 1000m of a roost will be limited to the period between one hour after sunrise to one hour before sunset.
RW-PD-28	Hedgerow removal and clearance of any other breeding bird vegetation will take place outside of the bird breeding season i.e. not during the period of March to August inclusive. This includes hedgerow and scrub removal in addition to hedgerow trimming.
RW-PD-29	Confirmatory surveys for active Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
RW-PD-30	All construction works within 150m of an active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer/outside of 1 hours after sunrise or before sunset during winter.
RW-PD-31	If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken while cubs are present in the holt and NPWS will be notified immediately
RW-PD-32	No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under license.

RW-PD-33	The prohibited working area associated with otter holts will, where appropriate, be fenced with temporary fencing prior to any possibly invasive works and declared as 'out of bounds'. Fencing will be in accordance with Clause 303 of the NRA's Specification for Roadworks (National Roads Authority). Appropriate awareness of the purpose of the enclosure will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each exclusion fence. All contractors or operators on site will be made fully aware of the procedures pertaining to each affected holt (NRA, 2006) and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to Local Authorities and relevant Statutory Consultees.
RW-PD-34	Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary of identified badger setts to determine the current status of known badger setts (i.e. active or inactive) and to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 10-12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced. NWPS will be notified immediately if the sett previously identified is confirmed as active or if a further active sett is located within 50 meters of the footprint of the development. If sett exclusion is required, this will be undertaken by an experienced ecologist under the necessary license and following best practice guidance (NRA, 2005).
RW-PD-35	No construction works will be carried within 50m of an active sett during the main breeding season (December 1st to June 30th).
RW-PD-36	Construction activity in the environs of a known active badger sett outside of the breeding period will follow NRA (2005) guidelines, i.e. no heavy machinery will be used within 30m of badger setts (unless carried out under license); lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances.
RW-PD-37	All construction works will be carried out during daylight hours. Security lighting will be used at the Consented Upperchurch Windfarm Site Compound No.1. All lighting will be cowled in order to prevent light spill and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.
RW-PD-38	Confirmatory surveys will be carried out at all trees with bat suitability that will require felling or other major modifications (e.g. removal of rotten branches). These trees will be subject to a ground-level visual inspection by the Project Ecologist (or a bat specialist acting on their behalf) prior to site clearance works in order to confirm the findings of the 2016 / 2017 surveys.
RW-PD-39	Where a tree with moderate or high bat suitability is to be felled, a presence/absence bat surveys will be carried out. (Note. It is not expected that any trees with moderate or high suitability will be felled).
RW-PD-40	Felling of trees with bat roost suitability will be undertaken in the period late-August to late-October/early-November. Trees with low suitability for bats will be felled carefully and slowly in order to avoid impact-related injuries to any bats that may be roosting inside them. Sections of the tree with potential roost features for bats (e.g. crevices, damaged branches) will be cut in sections, lowered carefully to the ground and left undisturbed for 48 hours before removal. (Note. It is not expected that any trees with moderate or high suitability will be felled).
RW-PD-41	Where the felling of trees with bat suitability is carried out, robust, weather-proof bat-boxes, for example Schwegler type 1FF and 2F models, will be placed in each of the affected sections to compensate for the loss of potential tree roosts. The number of bat boxes will match the number of trees with bat suitability to be felled. Bat boxes will be placed on an exposed section of tree trunk at a minimum height of 4-5m, providing a clear space in front of the box for bats to enter and exit. Boxes will be placed in locations that will receive at least 6-7 hours of sunlight during summer months, and will typically be placed on the southern side of the tree. The Project Ecologist will supervise the installation of bat boxes in order to ensure that they are sited appropriately.
RW-PD-42	Installation of bat crossing structures at severed hedgerows, proximate to areas of high bat activity or roost locations. And following the completion of construction works, the replanting of these severed hedgerows with at least the same number of semi-mature Irish-sourced, native trees and no temporary construction works area lighting near hedgerows.

RW-PD-43	Pre-construction survey of the distribution of Devil's-bit Scabious (larval food plant of Marsh Fritillary) during the last available April prior to the commencement of construction works. This requires that any areas of Devil's-bit Scabious that are located within the construction works area boundary, will be trimmed/cut to ground level in the last available late April / early May period prior to the commencement of construction.
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EIAR 14.3.2 UWF Related Works Monitoring Arrangements

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
RW-PD-04	Confirmatory consultations with Irish Water, Eir and ESB and confirmatory ground surveys at service locations will be carried out ahead of works; 'Goal Posts' will be used to identify and highlight the height of nearby overhead lines; and a foreman will look out for underground pipes during excavations near services.
RW-PD-08	All initial groundworks will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works. Where excavations occur in areas of archaeological potential such as fording points and associated marsh lands and watercourses all excavated material will be spread out and metal detected (under licence to National Monuments Service) as part of the finds retrieval strategy.
RW-PD-26	Confirmatory hen harrier breeding surveys will be completed, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the construction works area boundary. These surveys will be completed prior to the start-up of all construction activities, until construction is complete and for 3 years thereafter. No construction works for UWF Related Works will take place during the hen harrier breeding season (March to August).
RW-PD-29	Confirmatory surveys for active Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
RW-PD-34	Confirmatory surveys will be carried out within 50m of either side of the construction works area boundary of identified badger setts to determine the current status of known badger setts (i.e. active or inactive) and to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 10-12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced. NWPS will be notified immediately if the sett previously identified is confirmed as active or if a further active sett is located within 50 meters of the footprint of the development. If sett exclusion is required, this will be undertaken by an experienced ecologist under the necessary license and following best practice guidance (NRA, 2005).
RW-PD-38	Confirmatory surveys will be carried out at all trees with bat suitability that will require felling or other major modifications (e.g. removal of rotten branches). These trees will be subject to a ground-level visual inspection by the Project Ecologist (or a bat specialist acting on their behalf) prior to site clearance works in order to confirm the findings of the 2016 / 2017 surveys.
RW-PD-39	Where a tree with moderate or high bat suitability is to be felled, a presence/absence bat surveys will be carried out. (Note. It is not expected that any trees with moderate or high suitability will be felled).

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
RW-PD-40	Felling of trees with bat roost suitability will be undertaken in the period late-August to late-October/early-November. Trees with low suitability for bats will be felled carefully and slowly in order to avoid impact-related injuries to any bats that may be roosting inside them. Sections of the tree with potential roost features for bats (e.g. crevices, damaged branches) will be cut in sections, lowered carefully to the ground and left undisturbed for 48 hours before removal. <i>Note. It is not expected that any trees with moderate or high suitability will be felled).</i>
RW-PD-43	Pre-construction survey of the distribution of Devil's-bit Scabious (larval food plant of Marsh Fritillary) during the last available April prior to the commencement of construction works. This requires that any areas of Devil's-bit Scabious that are located within the construction works area boundary, will be strimmed/cut to ground level in the last available late April / early May period prior to the commencement of construction.
Traffic Management Plan	<ul style="list-style-type: none"> ▪ Along construction materials haulage routes, confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and falling weight deflectometer (FWD) surveys will be undertaken along the routes of concentrated construction traffic between the R503 and the site access points. ▪ Whilst it is not expected to occur, any damage to structures or road pavements will be repaired to at least as good a condition as pre-works, and on damaged sections of roads where the Surface Curvature Index (SCI), measured during FWD testing, is greater than 250, full-width surface overlay will be carried out.
Surface Water Management Plan	<ul style="list-style-type: none"> ▪ Water quality monitoring will be undertaken visually, and the contractor will have informed the Environmental Clerk of Works of any observed issues ▪ Work will not continue again until the source of the pollution is identified and eliminated <ul style="list-style-type: none"> ▪ Daily general visual inspections by Environmental Clerk of Works; ▪ Weekly (existing & new drains) inspections by site Construction Manager; ▪ All inspection to include all elements of drainage systems; ▪ Inspections required to ensure that drainage systems are operating correctly and to identify any maintenance that is required; ▪ Any changes, such as discolouration, odour, oily sheen or litter should be noted and corrective action should be implemented immediately. ▪ High risk locations such as settlement ponds will be inspected on a daily basis by the Construction Manager; ▪ Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; ▪ Event based inspections by the Environmental Clerk of Works as follows: <ul style="list-style-type: none"> ▪ >10 mm/hr (<i>i.e.</i> high intensity localised rainfall event); ▪ >25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or, ▪ Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). ▪ Monthly site inspections by the Project Hydrologist during construction phase; and, ▪ Quarterly site inspections by independent hydrologist during the construction phase and for a period of 6 months following construction.
Surface Water	Field monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Clerk of Works. He/she will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used.

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
Management Plan	<p>Surface water quality will be monitored during the construction phase and this monitoring will also extend into the post construction phase. Proposed monitoring locations downstream of the works areas (no. 6 in total) within the local surface water bodies (i.e. Clodiagh River, Owenbeg River, Turraheen River and Bilboa River) are shown on Figure SWMP 3.</p> <p>Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory.</p> <p>Monitoring frequency will be specified and finalised following consultation with Inland Fisheries Ireland and Tipperary County Council prior to commencement of construction. As a minimum, the monitoring programme will include:</p> <ul style="list-style-type: none"> ▪ Daily visual checks; ▪ Weekly sampling for suspended solids and turbidity in catchments where tree felling, earthworks or watercourse crossing work is on-going and monthly monitoring for all other parameters; ▪ Event based sampling, e.g. after heavy rainfall; ▪ Additional sampling in the event of trigger level exceedance, after heavy rainfall, etc., ▪ Post construction sampling programme (monthly sampling) for a period of six months. <p>The plant, machinery and tools used during construction will be regularly inspected for leaks and fitness for purpose.</p>
Invasive Species Management Plan	A full time invasive species specialist will be appointed to monitor key stages in construction, particularly when soil excavation begins near infested areas. The invasive species specialist will have a 'stop works' authority;
Waste Management Plan	The measured waste quantities will be used to quantify the costs of management and disposal in a Waste Audit Report, which will also record lessons learned from these experiences which can be applied to future projects. This report will be produced by the PSCS using inputs from the Waste Audit. The total cost of construction waste management will be measured and will take account of the purchase cost of materials, handling costs, storage costs, transportation costs, revenue from sales, disposal costs etc.
RW-BPM-03	All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.
RW-BPM-06	<ul style="list-style-type: none"> ▪ Inspection of main drainage ditches and outfalls will be completed during wet periods, and well in advance of the proposed felling works; ▪ Another full inspection of the proposed felling area will be completed by the Construction Manager one day in advance of the proposed felling works; ▪ Inspection of all areas reported as having unusual ground conditions, ▪ Pre-felling surface water sampling will be undertaken at the main watercourse downstream of the works area (sampling will be completed during a wet period). ▪ Surveying of drainage and ground conditions before and during tree felling activities.
RW-BPM-07	Regular pH monitoring of the construction drainage water will be completed. When there is an increase of pH above the natural baseline in the local stream, pH adjustment will be undertaken prior to the release of the surface water drainage.
RW-BPM-12	<ul style="list-style-type: none"> ▪ Monthly surveys following (SNH) guidance will be undertaken by a suitably qualified Ornithologist ▪ Confirmatory hen harrier breeding surveys will be completed, before construction works initiate, such that all pre breeding nuptial activity, nesting activity and active nests are recorded

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
	<p>within 2km of the construction works area boundary (Project Design Measure). Breeding Surveys will take place monthly between February and August of the construction year and will be targeted at confirming breeding attempts and/or nest locations within the 2km buffer area utilized to establish baseline conditions.</p> <ul style="list-style-type: none"> ▪ Confirmatory hen harrier roosting surveys will be completed, within 1000m of the construction works boundary. Roosting surveys will take place monthly between October and February of the construction year and will be targeted at confirming roosting locations within the 1km buffer area utilized to establish baseline conditions. ▪ These surveys (both breeding and roosting) will be completed prior to the start-up of all construction activities, until construction is complete and for 4 years thereafter (Years 1-3 and Year 5) (Project Design Measure). ▪ Surveys will also be undertaken in years coinciding with any National Surveys of Hen Harrier to fully inform future trends in respect of the Slievefelim to Silvermines Mountains SPA. ▪ The Project Ecologist will keep NPWS informed of the real-time status of nesting Hen Harrier as a result of the monitoring associated with this project.
RW-BPM-13	<ul style="list-style-type: none"> ▪ All known bat roosts within 150m of the construction works areas will be subject to confirmatory survey prior to the onset of construction works in order to identify any changes in the interim period since baseline establishment. Surveys will be carried out at a time of year that is appropriate to the type of roost e.g. June to August for maternity roosts, or November to February for hibernation roosts. This will ensure that the Project Ecologist has accurate information regarding the location and status of roosts, and that the lighting proposals can be adapted accordingly, if required. ▪ The Project Ecologist will communicate all bat survey results and information to the Project Team. This information will also be issued to the Local Authority and relevant statutory consultees, as agreed at the consenting stage.
RW-BPM-14	All bridges which were previously identified <u>as having evidence of bats or suitable crevices for bats</u> (Grade 1 to 3; Billington and Norman, 1997) will have a visual inspection (using lights, fiberscope, etc.) and bat detector surveys (to be undertaken throughout the duration of the night and include dusk emergence and dawn swarming periods) will be undertaken prior to the commencement of bridge maintenance/upgrade works to determine if bats are using the structure at the time of any works.
RW-BPM-15	<ul style="list-style-type: none"> ▪ Operational monitoring of bat roosts and sensitive severed hedgerow locations post construction to monitor effects (if any) from the construction of the UWF Related Works ▪ Post-construction activity surveys will be carried out annually by the Project Ecologist Roost surveys on roosts identified as part of baseline evaluation will be carried out under Licence within the suitable survey season as per Best Practice, ▪ All hedgerow locations subject to Bat Crossing Structures and reinstatement measures will also be surveyed by a suitably qualified Bat expert within the suitable survey season as per Best Practice. ▪ Surveys will be carried out annually during the early operational years and will continue until all revegetation has reached maturity and bat habitat severance effects are closed out. i.e. 6 years ▪ At the end of this period, if necessary, recommendations will be made on further survey requirements following consultation with NPWS.
RW-BPM-16	<ul style="list-style-type: none"> ▪ Monitoring in the form of confirmatory surveys will be carried out by the Project Ecologist to accurately determine the current status of invasive species locations identified during baseline studies.

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). (in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)	
	<ul style="list-style-type: none"> ▪ Surveying will be carried out each year of operation and this survey information will be used to inform any operational stage maintenance activities. Surveys will focus always on the works area plus 7m. Surveying of municipal areas – i.e. public road haulage routes, will not be included in surveys.
RW-BPM-17	Where clearance is required within the closed season, a survey will be carried out by the Project Ecologist for the presence of active birds' nests (i.e. nests with eggs or young birds).
RW-BPM-18	All works within a Root Protection Area (RPA) (see NRA guidance (2006) for calculation of the RPA) will be supervised by the Project Ecologist.
RW-BPM-19	<p>Kingfisher:</p> <ul style="list-style-type: none"> ▪ Confirmatory surveys will be carried out by a suitably qualified Ornithologist and will follow standard methodology (Cummins <i>et al</i>, 2010), ▪ Surveys will be undertaken between March and April (early visit) and again between May and June (late visit) of the construction year and will be targeted at confirming breeding attempts and/or nest locations along rivers within 300m of works area boundary (No nests were located within 300m during baseline surveys). ▪ All crossing locations will be also be surveyed to confirm Kingfisher suitability both in terms of nest banks and suitable bankside vegetation at the time of construction. ▪ No construction activities will be permitted within the temporal construction exclusion zone (500m) around identified nest locations during the bird breeding season (March – August inclusive or until nesting is confirmed as complete following supervision by a suitably qualified Ornithologist). ▪ During Kingfisher surveys, all crossing locations will also be surveyed to confirm the presence or absence of other aquatic/riparian species such as Dipper, Grey Wagtail.
RW-BPM-20	<ul style="list-style-type: none"> ▪ Surveying of identified badger setts within 50 m of either side of the construction works area boundary to determine the current status of known badger setts (i.e. active or inactive) and to determine if any new setts have been established in the period following the completion of construction. ▪ Surveys will be undertaken annually in Operational Years 1, 2, 3, 4 and 5. ▪ These surveys can be undertaken at any time of the year, but are most effective between November and April when vegetation cover is reduced. However, until mid-January, badgers are less active during colder weather and setts can appear less well-used (NRA, 2008).
RW-BPM-21	<p>Other Mammals:</p> <ul style="list-style-type: none"> ▪ Monitor the construction activities to ensure that mitigation measures are strictly adhered to at all times. ▪ Confirmatory surveys (of suitable habitat) for the presence/absence of other mammals or their breeding/resting places within 50m of the construction works area will be undertaken prior to the commencement of vegetation and/or hedgerow clearance and excavations. ▪ Confirmatory surveys to check for any new dens/dreys that may have arisen between the time of the original survey and start of works will be carried out by the Project Ecologist; ▪ The Project Ecologist will communicate all confirmatory survey results and information to the Project Team. This information will also be issued to the Local Authority and relevant statutory consultees, as agreed at the consenting stage. ▪ On-going survey of any dreys within 50m of works areas to monitor the breeding status of the drey, (red squirrels can move dreys during the breeding season, so a non-breeding drey could change status).

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
RW-BPM-22	Visual inspections will be carried out on all machinery and equipment (particularly for machinery and equipment exiting the site and which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris. Any attached or adherent material will be removed before entering or leaving the site of operation, securely stored away from traffic for removal to the waste storage area in the Temporary Compound at the end of the work day.
RW-BPM-23	<ul style="list-style-type: none"> ▪ Monitor the construction activities when working adjacent to amphibian breeding habitat to ensure that mitigation measures are strictly adhered to at all times. ▪ Should construction activities be scheduled for areas proximal to previously identified habitat suitable for breeding common frog or smooth newt during the species' respective breeding seasons (frogs: January-March and newts: March-May), confirmatory surveys following standardised methodologies will be carried out at those locations to confirm the presence/absence of breeding adults and/or spawn.
RW-BPM-24	<ul style="list-style-type: none"> ▪ Monitor the construction activities to ensure that mitigation measures are strictly adhered to at all times. ▪ As Viviparous lizards are widespread in Ireland and can be found in a range of habitat types such as in bog, heath, the margins of coniferous woodlands, in addition to being common in a range of grassland habitats, particularly those not subject to heavy grazing pressure, a spot-check confirmatory survey by the Project Ecologist will be required within these habitats prior to the commencement of the construction stage to confirm the presence/absence of individuals.
RW-BPM-25	<ul style="list-style-type: none"> ▪ March Fritillary: Carrying out of Confirmatory Survey of suitable habitat ▪ Monitor the construction works when working adjacent to Marsh Fritillary habitat to ensure that mitigation measures are strictly adhered to at all times. ▪ Confirmatory survey of the distribution of Devil's-bit Scabious (larval food plant of Marsh Fritillary) (project design measure) ▪ The survey will be carried out during the last available April prior to the commencement of construction in suitable habitat within 50m of the construction works area ▪ Surveys will be completed within 12 months prior to the commencement of the construction stage, within the correct seasonal period as per Best Practice. ▪ Survey all areas with identified Marsh Fritillary colonies within the correct seasonal period annually, in years 1, 2, 3 of operation as per Best Practice, ▪ Surveying will monitor the status of Marsh Fritillary colonies and record any change to baseline trends as a result of the development of the UWF Related Works.
RW-BPM-26	Monitor the recruitment and training of local employees in line with Policy
RW-BPM-29	During movement of materials both on and off-site, trucks will be covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected by a visual inspection by a competent person to ensure no potential for dust emissions. If dust potential exists it will be mitigated using the appropriate measures such as wheel washing or covering of materials.
RW-BPM-30	Public Roads: Along construction materials haulage routes, confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and FWD surveys will be undertaken along the routes of concentrated construction traffic between the R503 and the site entrances on the local road network. Whilst it is not expected to occur, any damage to structures or road pavements will be repaired to at least as good a condition as pre-

UWF Related Works Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
	works, and on damaged sections of roads where the Surface Curvature Index (SCI), measured during FWD testing, is greater than 250, full-width surface overlay will be carried out.
RW-BPM- 31	<ul style="list-style-type: none"> ▪ A confirmatory survey of Electromagnetic Field emissions from locations along the Internal Windfarm Cabling will be carried out by a competent engineer. The locations along the Internal Windfarm Cabling will include the following 9 No. local road crossings in Knockmaroe/Knockcurraghbola Crownlands, Knockcurraghbola Commons and Foilnaman. ▪ Reporting by the competent engineer of the compliance of operational EMF emission levels with the levels predicted in the 2019 Revised EIA Report.
RW-BPM-32	Recording and reporting of the annual renewable electricity production of the operational UWF.
Outline Construction Methods	<p>Pre-Construction Windfarm Monitoring Activities</p> <ul style="list-style-type: none"> ▪ Road condition monitoring surveys, the first of which will take place prior to the commencement of construction activities. ▪ Pre-construction water quality monitoring surveys, will be carried out ▪ Pre-construction ecological confirmatory surveys.

EIAR 14.3.3 Authorised UWF Related Works Conditions of Planning (Ref. 303634-19)

Condition 1: The development shall be carried out and completed in accordance with the plans and particulars lodged with the application, as amended by the further plans and particulars submitted on the 9th day of November 2018, and by the further plans and particulars received by An Bard Pleanála on the 6th day of February 2019, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development and the development shall be carried out and completed in accordance with the agreed particulars.

Condition 2: Apart from any departures specifically authorised by this permission, the development shall be carried out and completed in accordance with the terms and conditions of the permission granted on under An Bard Pleanála appeal PL22.243040 (planning authority register reference 13/510003) and any agreements entered into thereunder.

Condition 3: This permission shall not be construed as any form of consent or agreement to a connection to the national grid or to the routing or nature of any such connection.

Condition 4: The mitigation measures contained in the Natura Impact Statement which was submitted with the appeal shall be implemented in full.

Condition 5: The mitigation and monitoring measures contained in the Environmental Impact Assessment Report and associated documentation submitted with the appeal shall be implemented in full.

Condition 6: The developer shall retain the services of a suitably qualified and experienced bird specialist to undertake appropriate surveys of this site for the Hen Harrier. Details of the surveys to be undertaken shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 7: Details of landscaping alongside the proposed access roadways, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 8: In the event that the proposed development causes interference with telecommunications signals, effective measures shall be introduced to minimise such interference. Details of these measures, which shall be at the developer's expense, shall be submitted to, and agreed in writing with, the planning authority prior to commissioning of the turbines and following consultation with the relevant authorities.

Condition 9: Details of aeronautical requirements shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Subsequently the developer shall inform the planning authority and the Irish Aviation Authority of the co-ordinates of the 'as constructed' positions and highest point of the telecoms pole and turbines (to the top of the blade spin).

Condition 10: Prior to commencement of development, a detailed Construction Management Plan for the construction stage shall be submitted to, and agreed in writing with, the planning authority generally in accordance with the proposals set out in the Revised Environmental Impact Assessment Report. The Construction Management Plan shall incorporate the following:

- (a) a detailed plan for the construction phase incorporating, inter alia, construction programme, supervisory measures, noise management measures, construction hours and the management of construction waste,
- (b) a comprehensive programme for the implementation of all monitoring commitments made in the application and supporting documentation during the construction period,

- (c) details of a pre-construction survey to identify/confirm the absence of any Hen Harrier nests within the subject site, and including a work cessation protocol including appropriate buffer in the vicinity of any identified nest, until the nest has been vacated at the end of the breeding season,
- (d) an emergency response plan, and
- (e) proposals in relation to public information and communication. A record of daily checks that the works are being undertaken in accordance with the Construction Management Plan shall be available for public inspection by the planning authority.

Condition 11: Details of the road network to be used by construction traffic and by the long-term maintenance traffic including detailed arrangements for the protection of bridges to be traversed shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 12: (a) The applicant shall engage with the services of a suitably qualified archaeologist to monitor all topsoil stripping and groundworks associated with the development, licenced under the National Monuments Acts, 1930-1994. No sub-surface work shall be undertaken in the absence of an archaeologist without his/her express consent.

(b) The archaeologist is required to notify the Heritage Division of the Department of Arts, Heritage and the Gaeltacht in writing at least four weeks prior to the commencement of site preparations. This will allow the archaeologist sufficient time to obtain a licence to carry out the work.

(c) Should archaeological material be found during the course of monitoring, the archaeologist may have work on the site stopped, pending a decision as to how best to deal with the archaeology. The applicant shall be prepared to be advised by the Heritage Division of the Department of Arts, Heritage and the Gaeltacht with regards to any necessary mitigating action (e.g. preservation in situ, or excavation) and shall facilitate the archaeologist in recording any material found.

(d) A buffer zone measuring at least 30 metres in width shall be established around Recorded Monument TN039-046 Ring- Barrow, which is located within the development area, as identified in the archaeological assessment included in the Environmental Impact Assessment Report. No groundworks, landscaping, site offices, compound/depot or storage facilities shall be established within this buffer zone.

(e) The planning authority and the Department of Arts, Heritage and the Gaeltacht shall be furnished with a report describing the results of the archaeological monitoring, and including any necessary specialist reports, following the completion of all archaeological work on site.

Condition 13: Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the relevant planning authority, to secure the reinstatement of public roads which may be damaged by the transport of materials to the site, coupled with an agreement empowering the relevant planning authority to apply such security or part thereof to the satisfactory reinstatement of the public road. The form and amount of the security shall be as agreed between the relevant planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Condition 14: Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the satisfactory reinstatement of the site upon cessation of the project coupled with an agreement empowering the planning authority to apply such security or part thereof to such reinstatement. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Condition 15: The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The

contribution shall be paid prior to commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to An Bord Pleanála to determine the proper application of the terms of the Scheme.

EIAR 14.4 Mitigation, Monitoring and Planning Conditions for UWF Grid Connection

EIAR 14.4.1 UWF Grid Connection Project Design Measure (GC-PD)

UWF Grid Connection Project Design Measure (GC-PD)	
GC-PD-01	UWF Grid Connection construction works during the Hen Harrier breeding season (March to August inclusive) will only take place at the Mountphilips Substation Site; construction of the 110kV UGC between the Mountphilips Substation site and the Consented UWF Substation compound will be carried out during the months of September to February inclusive.
GC-PD-02	If works at Mountphilips Substation site are programmed to begin in the Hen Harrier breeding season (March to August) confirmatory Hen Harrier breeding surveys will be completed, before such works initiate, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the entire construction works area boundary. These surveys will be completed prior to the start-up of all construction activities. No works will take place within 2 km of any identified active Hen Harrier nest during the hen harrier breeding season.
GC-PD-03	Although no hen harrier roosts are currently known to occur within 1km of UWF Grid Connection, confirmatory surveys will be completed to record any roosting locations within 1km of UWF Grid Connection. Should a hen harrier roost occur within 1km of UWF Grid Connection works, then construction works within 1km of a roost will be limited to the period between 'one hour after sunrise' to 'one hour before sunset' during the Hen Harrier roosting season (October to February inclusive).
GC-PD-04	All construction works will be carried out during daylight hours.
GC-PD-05	At the Mountphilips Substation site, construction traffic will be restricted to the construction works area and tracking across adjacent ground will not be permitted. A speed limit of 25km/hr for all traffic/machinery will be implemented at the Mountphilips Substation site. Outside of Mountphilips Substation site, all construction will be restricted to the paved road surfaces or built surfaces along the 110kV UGC. A speed limit of 50km/hr for all delivery and construction traffic will be implemented on Local Roads ('L' roads).
GC-PD-06	Construction works will not be carried out within 150m of Rear Cross National School or Lackamore National School, during school hours. In addition, the project Community Liaison Officer will keep each school informed of construction timetables and scheduling.
GC-PD-07	110kV UGC construction works along the local roads L2264-50 and L6188-0, will not take place at the same time as the UWF Related Works Haul Route Works on these roads. The 110kV UGC construction works will also be scheduled so that the works do not occur on the same days as concrete deliveries for Consented UWF Turbines along these local roads.
GC-PD-08	Confirmatory consultations with Irish Water, Eir and ESB and review of all relevant infrastructure mapping before works, along with confirmatory ground surveys at service locations will be carried out ahead of works; 'Goal Posts' will be used to identify and highlight the height of nearby overhead lines; and a banksman will accompany each excavator to oversee all excavation works.
GC-PD-09	Close contact with the local Newport Regional Supply office at Newross will be maintained by the Environmental Clerk of Works throughout the construction of the 110kV UGC. The Environmental Clerk of Works will keep the Newport Regional Water Supply office up-to-date with the location and schedule of works. To reduce risk of damaging water mains; pre-construction confirmatory surveys will be carried out, and excavations will be hand dug within 500mm of pipes. So that any damage (should it occur) can be fixed immediately, a supply of water mains repair materials will be kept at the Mountphilips Substation compound and at each works location on the public road network.

UWF Grid Connection Project Design Measure (GC-PD)	
GC-PD-10	Flag-men will be used at 110kV UGC works locations on the public roads subject to one lane closures. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the public road network in a safe and efficient manner. The works will be carried out according to the Traffic Management Plan for UWF Grid Connection. The Traffic Management Plan forms part of the Environmental Management Plan.
GC-PD-11	Construction works for the 110kV UGC in Knocknabansha, Knockmaroe, Knockcurraghbola Crownlands and Knockcurraghbola Commons townlands, which are within 350m of local residences, will not take place at the same time as either the UWF Related Works or Upperchurch Windfarm where those works also occur within 350m.
GC-PD-12	As requested by the Roads Department of Tipperary County Council, during pre-planning consultations, the works along the public road network will be scheduled to minimise impacts on schools and local businesses. The works will be scheduled so that they do not disrupt or interfere with Tipperary County Council's road works programme on the R503 through Newport town.
GC-PD-13	As requested by the Roads Department of Tipperary County Council, during pre-planning consultations, the Promoter will fund the costs of Tipperary County Council engaging a chartered Civil Engineer to oversee quality control and compliance with drawings, specifications and road opening conditions for the duration of the works
GC-PD-14	All initial groundworks within 500m of an RMP or NIAH site, will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works.
GC-PD-15	Where excavations occur at culvert replacement locations along the 110kV UGC, and at the 3 No. new watercourse crossing at the Mountphilips Substation site, excavations will be monitored by an appropriately qualified archaeologist under license from the National Monuments Service, the excavated material will be examined for any evidence of archaeological material and metal detected as part of a finds retrieval strategy.
GC-PD-16	No refuelling of plant or equipment will be permitted within 100m of identified water supply wells
GC-PD-17	At Mountphilips Substation, water for operational stage welfare facilities will be obtained from a Rain Water Harvesting system. Waste water will be collected in tanks and removed from site by an appropriately licensed operator, for treatment in a licensed water treatment plant. These two measures will avoid the need for a new well or mains water connection and will avoid the need to treat waste water on-site.
GC-PD-18	The new substation compound and the new permanent access road at the Mountphilips Substation site will have a permanent surface water drainage network in place which will include check dams. These check dams will allow the settlement of suspended solids in water runoff while also slowing down the rate of water run-off from these areas.
GC-PD-19	At Mountphilips Substation location, where dewatering of trenches or excavations is required, there will be no direct discharge of untreated water into any watercourse or drain. Rather all pumped water will be treated prior to discharge using an infiltration trench or settlement pond or suitable water treatment train such as a Siltbuster, as appropriate to the volume of water requiring treatment (if any) to ensure there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009.
GC-PD-20	At Mountphilips Substation site, all excavated material will be removed for temporary or permanent storage at designated berms, which will be located more than 25m away from the watercourses on Mountphilips Substation site. All storage berms will be graded and sealed following emplacement. The berms will be covered if there is a risk of erosion. Temporary silt control methods such as silt fencing will be placed around all overburden storage areas. The existing vegetative buffer between the berms and the nearest watercourses will be maintained and no works will occur in the buffer zone.
GC-PD-21	At Mountphilips Substation site, the permanent storage berms will be along the new access road and around the substation compound will be planted with local provenance native fruiting hedge species, with grasses and native flower species common to the surrounding vegetation sown along the sides of the berms. Local provenance native wildflower seed of flowering plants like clovers,

UWF Grid Connection Project Design Measure (GC-PD)	
	vetches and knapweed will be included. Revegetation works will take place at the soonest practicable opportunity after emplacement.
GC-PD-22	Outside of the Mountphilips Substation site, there will be no storage of overburden and all excavations from road trenches will be removed to licensed waste facilities in accordance with the UWF Grid Connection Waste Management Plan. Loads of excavated material will be covered during transportation to prevent spillages of excavated material.
GC-PD-23	All Joint Bays for the 110kV UGC will be located at least 50m from a Class 1 or Class 2 watercourse and at least 25m from Class 3 or Class 4 watercourses.
GC-PD-24	Outside of the Mountphilips Substation site, where dewatering of trenches or excavations is required for the 110kV UGC, there will be no direct discharge of treated water into any watercourse or drain. Rather all pumped water will be treated using a mobile water treatment train and then discharged via a silt bag to ensure there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009.
GC-PD-25	Construction works along the 110kV UGC route will cease during heavy or prolonged rainfall events, and any open trenches or excavations will be covered. Use of weather forecasting will be undertaken in advance of works.
GC-PD-26	A phased approach will be undertaken in relation to excavations, excavation dewatering and any culvert replacement works, where these works occur within 50m of a watercourse. The phased approach will only permit one of main potential sediment producing activities (i.e. excavations, excavation dewatering or culvert replacement works), to be carried out within 50m of a watercourse, at any one time.
GC-PD-27	At Mountphilips Substation site, works within 50m of watercourses, additional mitigation measures include double silt fencing, temporary drain blocking, placement of straw bale arrangements along preferential surface water flowpaths and, where necessary, the use of matting to prevent ground erosion and rutting.
GC-PD-28	Along the 110kV UGC on the public road, where works will take place within 50m of a watercourse, additional mitigation measures will be implemented which include silt fencing and placement of sandbag arrangements along preferential surface water flowpaths on the road pavement. Following works on any particular section, any works debris will be removed from the road before the sandbags and silt fences are removed.
GC-PD-29	Cable trenching works, joint bay chamber installation and culvert replacement works on the section of 110kV UGC between W13 and W20 (inclusive) and the culvert replacement works at W32 and W34 will only be completed during dry weather in the dryer months of the year – i.e. February to September inclusive. This will minimise/avoid the requirement for any excavation dewatering as a result of waterlogged soils or surface water runoff. None of these 110kV UGC sections are within the Lower River Shannon SAC.
GC-PD-30	Lines of silt fencing and sandbags will be erected along the edge of the road so that surface water runoff from adjacent construction works areas is captured and directed to the excavated trench, where it can be pumped and treated before being released, as per PD24.
GC-PD-31	Works to bridge parapet walls at watercourse crossings W7, W36, W53 will be carried out during dry weather, and debris netting will be fixed to the outside of the walls in order to prevent any debris falling into the watercourse below.
GC-PD-32	At Mountphilips Substation site, instream construction works at the watercourse crossings W1, W2 and W3 will be followed by site-specific reinstatement measures to ensure the equilibrated restoration of flow character and morphology within the affected reach to achieve baseline character and avoid any deterioration in morphology as required under the Water Framework Directive (WFD). Measures will include: bank stabilisation using boulder armour or willow/brush bank protection; reinstatement of bank slope and character, creation of compound channels where necessary; reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and planting along the riparian margins to stabilise banks, add flood protection and provide riparian buffer; and the use of deflector plates during the restoration of flow. Instream works at W1, W2 and W3 at the Mountphilips Substation site will be undertaken during dry weather within the IFI instream works window (July – September inclusive). As per PD41,

UWF Grid Connection Project Design Measure (GC-PD)	
	instream works at W1, W2 and W3 will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice are followed. Although intended for the purpose of the WFD, this measure will also indirectly contribute to downstream water quality protection in the SAC.
GC-PD-33	All new permanent watercourse culverts at the Mountphilips Substation site and any replacement culverts along the public road for the 110kV UGC will be sized to cope with a minimum 100-year flood event.
GC-PD-34	Only precast concrete culverts or structures will be used at the watercourse crossing locations at Mountphilips Substation site and for any culvert replacements along the 110kV UGC. Only precast concrete chambers will be used at Joint Bay locations. No batching of wet cement will take place on-site.
GC-PD-35	Concrete pours will be required for the 110kV UGC cables trench. Only chutes will be washed out at the works locations into the cable trench, with the washout of the tank taking place at the concrete supplier depot. Concrete chute washouts within the SAC boundary will take place into designated bins for removal to the designated concrete wash settlement pond at the Mountphilips Substation site.
GC-PD-36	The sections of 110kV UGC trenches that overlap the Lower River Shannon SAC will be lined with an impermeable geotextile material to prevent potential migration of cement from the trench base or sides into the SAC.
GC-PD-37	In addition to PD22, there will be no storage of overburden within the Lower River Shannon SAC.
GC-PD-38	110kV UGC works outside of Mountphilips Substation site will be carried out entirely on paved roads and where the 110kV UGC crosses watercourses, the works will be carried out over the existing bridges and over/under existing culverts. No in-streams works are proposed at any watercourse crossing points (including the Newport River and Bilboa River crossings) within the boundary of the Lower River Shannon SAC and therefore there will be no placement of cement or other materials within the river channels or on the river banks within the SAC.
GC-PD-39	In addition to PD42, there will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within 100m of the boundary of the Lower River Shannon SAC.
GC-PD-40	In addition to PD29, all 110kV UGC works within the boundary of the Lower River Shannon SAC will only be completed during dry weather in the dryer months of the year – i.e. February to September included.
GC-PD-41	The instream works at W1, W2 and W3 at Mountphilips Substation site, and the culvert replacement works at the 13 existing culverts on the public road, and all works (including concrete placement) within the boundary of the Lower River Shannon SAC, will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice Measures are followed.
GC-PD-42	There will be no refuelling of vehicles or plant permitted within 100m of a watercourse. Spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment. The Environmental Emergency Response Procedure will be implemented immediately in the event of any spills. The Environmental Emergency Response Procedure is part of the UWF Grid Connection Environmental Management Plan.
GC-PD-43	The main fuel stocks for, and chemical wastes arising from, construction activities will be stored in a designated location, away from main traffic activity, within the temporary compound at the Mountphilips Substation site. All fuel will be stored in bunded, locked storage containers. The designated storage location will be greater than 100m from a watercourse. Spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored at the designated location in the temporary compound and all operators will be fully trained in the use of this equipment. The Environmental Emergency Response Procedure will be implemented immediately in the event of any spills. The Environmental Emergency Response Procedure is part of the UWF Grid Connection Environmental Management Plan.
GC-PD-44	Overnight parking of plant and machinery will only be permitted at the temporary compound at the Mountphilips Substation site and at a distance greater than 50m from watercourses.
GC-PD-45	The horizontal directional drilling works at W8 and W9 will be carried out by an experienced Drilling Contractor and supervised and managed by a competent and experienced Mud Engineer who

UWF Grid Connection Project Design Measure (GC-PD)	
	understands the technicalities and challenges of drilling works. The Mud Engineer will advise the Construction Manager on the selection of competent drillers for the HDD works; monitor the watercourse bed during drilling works, and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures. From a surface water quality protection perspective, the area around the launch/reception pit, bentonite batching, pumping and recycling plant will be bunded using appropriate terram geotextile and/or sandbags in order to contain any spillages. Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized water tight skip before being taken off-site to a suitably licensed waste facility. In the event of a break-out occurring, the Environmental Emergency Response Procedure for Frac-Out will be implemented which includes the following contingency measures; In the event of break-out occurring in the river bed, the rig will immediately shut off the pumps and the drilling assembly will be pulled off to reduce annular pressures; In the event of break-out on the road an excavator will be available to dig a pit to contain fluid with vacuum trucks/pumps available to transfer drill fluid from the containment point back to the recycling point; and in either scenario, drilling fluid additives designed to plug the formation will be introduced to the circulation system and let set. Environmental Emergency Response Procedures are included in the UWF Grid Connection Environmental Management Plan.
GC-PD-46	All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments, which include the Project Design Measures, as per the UWF Grid Connection Environmental Management Plan.
GC-PD-47	Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained and that there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009. Where non-compliance in water quality is measured or recorded, works will stop until the issue is resolved. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection. The Surface Water Management Plan is part of the UWF Grid Connection Environmental Management Plan.
GC-PD-48	The new permanent cross structures at the Mountphilips Substation site and the replacement culvert at W14 along the R503 will be bottomless or clear spanning.
GC-PD-49	In-stream works at Mountphilips Substation site and culvert replacement works at W14 along the R503 Regional Road will only be undertaken during the IFI specified period (July, August and September) and will be carried out to best practice (IFI, 2016).
GC-PD-50	Culvert replacement works along the 110kV UGC will not be undertaken without isolation of flow within the watercourse. Isolation of flow will be achieved through the use of sandbags filled with clean, washed sand. Any fish within the isolated section will be removed prior to works commencing. This will require the engagement of licensed fisheries personnel to deplete the works area using electrofishing and, following collection of biometrics, transferred immediately downstream of the crossing point and placed back in the water. The water will then be isolated from the works by over pumping using a flume (pipe), with deflector plates used on the downstream side of the flume to reduce the hydraulic power of the water. Construction works at the crossing will be followed by site-specific reinstatement measures to ensure the equilibrated restoration of flow character and morphology within the affected reach to achieve baseline character and avoid any deterioration in morphology as required under the Water Framework Directive (WFD). Measures will include: bank stabilization measures, reinstatement of bank slope and character; and reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and the use of deflector plates during the restoration of flow. As per PD41, culvert replacement works will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice are followed. These measures will ensure that the baseline character is maintained and will ensure that a deterioration in morphology is avoided, as required under the Water Framework Directive. This in turn will protect Aquatic Ecology.

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GC-PD-51	The sections of the 110kV UGC trench within the R503, in the central part of the 110kV UGC where the adjacent lands comprise predominantly peaty soils, will be lined with a geotextile membrane which will provide support to the cables trench and the road structure.
GC-PD-52	Confirmatory surveys for active Otter holts and breeding activity will be carried out 150m upstream and downstream of watercourse crossing locations including those watercourses evaluated as unsuitable for Otter in the current appraisal.
GC-PD-53	All construction works within 150m of an active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer and outside of 1 hour after sunrise or before sunset during winter.
GC-PD-54	If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken while breeding females or cubs are present in the holt and NPWS will be notified immediately
GC-PD-55	No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand will not take place within 15m of such holts, except under license.
GC-PD-56	The prohibited area associated with otter holts, should they be located in confirmatory surveys, will, where appropriate, be protected from any inadvertent disturbance from any works or personnel occurring nearby such as at a bridge and declared as 'Ecology Restriction Zone' with no mention of otters to any onsite staff. Appropriate awareness of the purpose of the excluded area will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each possible access point. All contractors or operators on site will be made fully aware of the procedures pertaining to Ecology Restriction Zones and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to Local Authorities and relevant Statutory Consultees.
GC-PD-57	All excavation works will take place in line with protective measures required to avoid damage to trees during the construction phase of road projects, as stipulated in the NRA document 'Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post construction of National Road Schemes'. This will include consultation with a qualified arborist, where appropriate to ensure works within the Root Protection Area (RPA) avoid any significant damage to tree roots. Exposed tree roots will be protected where required and excavation methods will be appropriately undertaken so as to avoid damage to RPA's. All excavation works in the RPA will be overseen by the Project Ecologist.
GC-PD-58	Hedgerow removal and clearance of any other breeding bird vegetation will take place outside of the bird breeding season <i>i.e.</i> not during the period of March to August inclusive. This includes hedgerow and scrub removal in addition to hedgerow trimming.
GC-PD-59	Works will not take place at any bridge during the Dipper breeding season (Feb-June inclusive) without a confirmatory survey to determine Dipper presence or absence. If Dippers are present, where possible works will not proceed until breeding has completed. All works at these and other bridges will be overseen by a project ecologist to ensure the requirements of the Wildlife Acts are being met. During culvert replacement works at W13, a Dipper nest box will be fitted to the new crossing structure. Additional nest boxes (c.10) will be provided for Dipper at suitable bridges to provide a net gain for this species.
GC-PD-60	Where works will be carried out at parapet walls, no works will take place between the period April-August without confirmatory survey as to the presence or absence of breeding Grey Wagtail. If breeding Grey Wagtail is present, then works will be overseen by a suitably qualified ecologist to ensure no effects occur to Grey Wagtail present in adherence to the requirements of the Wildlife Act. Works at all bridges will be overseen by the project Ecologist. Nest boxes (c.10) will be provided for Grey Wagtail at suitable bridges to provide a net gain for this species.
GC-PD-61	Works will not take place at any bridge during the Kingfisher breeding season (March to July inclusive) without a confirmatory survey to determine the presence of nesting Kingfisher within 150m upstream or downstream of the bridge. If nesting Kingfishers are present, works will not proceed until breeding has completed.
GC-PD-62	All bridges/structures where works are proposed will be subject to confirmatory surveys for General breeding birds prior to works commencing. All works will be supervised by the project Ecologist.

UWF Grid Connection Project Design Measure (GC-PD)	
GC-PD-63	All construction works will be carried out during daylight hours. Security lighting will be used at the temporary compound at Mountphilips Substation site. All lighting will be cowled in order to prevent light spill and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.
GC-PD-64	Tree felling only pertains to the Mountphilips Substation site. Confirmatory surveys will be carried out at all trees that will require felling or other major modifications (e.g. removal of rotten branches) in order to confirm the findings of the 2016 / 2017 surveys regarding the suitability of the trees for roosting bats. These trees will be subject to a ground-level visual inspection by the Project Ecologist (or a bat specialist acting on their behalf) prior to site clearance works.
GC-PD-65	While it is not expected that any trees with high suitability for roosting bats will be felled, the following measures will be implemented where a tree with moderate or high bat suitability is to be felled: a presence/absence bat surveys will be carried out; Felling of trees with bat roost suitability will be undertaken in the period late-August to late-October/early-November. Trees with low suitability for bats will be felled carefully and slowly in order to avoid impact-related injuries to any bats that may be roosting inside them. Sections of the tree with potential roost features for bats (e.g. crevices, damaged branches) will be cut in sections, lowered carefully to the ground and left undisturbed for 48 hours before removal; and Where the felling of trees with bat suitability is carried out, robust, weather-proof bat-boxes, for example Schwegler type 1FF and 2F models, will be placed in each of the affected sections to compensate for the loss of potential tree roosts. The number of bat boxes will match the number of trees with bat suitability to be felled. Bat boxes will be placed on an exposed section of tree trunk at a minimum height of 4-5m, providing a clear space in front of the box for bats to enter and exit. Boxes will be placed in locations that will receive at least 6-7 hours of sunlight during summer months, and will be placed on the southern side of the tree. The Project Ecologist will supervise the installation of bat boxes in order to ensure that they are sited appropriately.
GC-PD-66	All bridges of moderate suitability for bats will be subject to a confirmatory survey prior to the commencement of construction works. Bridges of negligible or low suitability do not need to be surveyed, but this will be reviewed by the Environmental Clerk of Works and Project Ecologist. If a bat roost is found, the Project Ecologist will review the proposed works at that bridge, and determine whether there could be a risk of impacts on the roost. If there is a risk of impact on a bat roost in a bridge, the Project Ecologist will develop a case-specific mitigation strategy and apply to the NPWS for a derogation licence. Bats will be excluded from the bridge for the duration of construction works (typically only a few days), and replacement roosting opportunities (i.e. wall-mounted bat 'tubes' or boxes) will be provided at a suitable location nearby. When construction work is complete, bats will be able to return to their former roosting site.
GC-PD-67	No badger setts were recorded within 50m of the UWF Grid Connection during pre-planning surveys. Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced. Should a badger sett be confirmed, the following measures will be implemented: NWPS will be notified immediately of any new active setts which are located within 50 meters of the footprint of the development; If sett exclusion is required, this will be undertaken by an experienced ecologist under the necessary license and following best practice guidance (NRA, 2005); No construction works will be carried within 50m of an active badger sett during the main breeding season (December 1st to June 30th); and Construction activity in the environs of an active badger sett outside of the breeding period will follow NRA (2005) guidelines, i.e. no heavy machinery will be used within 30m of badger setts (unless carried out under license); lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand will not take place within 10m of sett entrances.
GC-PD-68	As amphibians and reptiles will use brash piles for refuge and hibernation, all logs/brash created from hedgerow/tree removal at the Mountphilips Substation site will be removed off site immediately to prevent disturbance to amphibians/reptiles which may use brash piles if left in situ.
GC-PD-69	All covering of vegetative invasive knotweed infestations with high density polyethylene grass carpet terram will take place, at all identified locations prior to any works commencing on UWF

UWF Grid Connection Project Design Measure (GC-PD)	
	Grid Connection or any other element of the Whole UWF Project. The covering of infestations will be completed on sections seven days in advance of works occurring on those sections. The infestations will be covered so that their full extent plus 1 metre is covered entirely and no vegetation is visible. The covering of these infestations will only be carried out under the direct supervision of an ecologist with prior experience of this type of work i.e. this work cannot be carried out by any general construction staff. No posts will be used to secure the coverings i.e. there will be no ground interference during any of these operations.

EIAR 14.4.2 UWF Grid Connection Monitoring Arrangements

UWF Grid Connection Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
GC-PD-02	If works at Mountphilips Substation site are programmed to begin in the Hen Harrier breeding season (March to August) confirmatory Hen Harrier breeding surveys will be completed, before such works initiate, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the entire construction works area boundary. These surveys will be completed prior to the start-up of all construction activities. A report including nesting activity and levels of usage will be provided to the Competent Authority and NPWS following the completion of each survey season. The Project Ecologist will keep NPWS informed of the real-time status of nesting Hen Harrier as a result of the monitoring associated with this project.
GC – PD-03	Although no hen harrier roosts are currently known to occur within 1km of UWF Grid Connection, confirmatory surveys will be completed to record any roosting locations within 1km of UWF Grid Connection. A report including roosting activity and levels of usage, will be provided to the Competent Authority and NPWS following the completion of each survey season.
GC-PD-08	Confirmatory consultations with Irish Water, Eir and ESB and review of all relevant infrastructure mapping before works, along with confirmatory ground surveys at service locations will be carried out ahead of works.
GC-PD-14	All initial groundworks within 500m of an RMP or NIAH site, will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works.
GC-PD-16	Where excavations occur at culvert replacement locations along the 110kV UGC, and at the 3 No. new watercourse crossing at the Mountphilips Substation site, excavations will be monitored by an appropriately qualified archaeologist under license from the National Monuments Service, the excavated material will be examined for any evidence of archaeological material and metal detected as part of a finds retrieval strategy.
GC-PD-32, #GC-PD-41	The instream works at W1, W2 and W3 at Mountphilips Substation site, and the culvert replacement works at the 13 existing culverts on the public road, and all works (including concrete placement) within the boundary of the Lower River Shannon SAC, will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice Measures are followed.
GC-PD-45	The horizontal directional drilling works at W8 and W9 will be supervised and managed by a competent and experienced Mud Engineer who understands the technicalities and challenges of drilling works. The Mud Engineer will monitor the watercourse bed during drilling works, and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures.

UWF Grid Connection Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). <i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i>	
GC-PD-46	All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments, which include the Project Design Measures, as per the Environmental Management Plan for UWF Grid Connection.
GC-PD-47	Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection.
GC-PD-52	Confirmatory surveys for active Otter holts and breeding activity will be carried out 150m upstream and downstream of watercourse crossing locations including those watercourses evaluated as unsuitable for Otter in the current appraisal.
GC-PD-59	Works will not take place at any bridge during the Dipper breeding season (Feb-June inclusive) without a confirmatory survey to determine Dipper presence or absence.
GC-PD-60	Where works will be carried out at parapet walls, no works will take place between the period April-August without confirmatory survey as to the presence or absence of breeding Grey Wagtail.
GC-PD-61	Works will not take place at any bridge during the Kingfisher breeding season (March to July inclusive) without a confirmatory survey to determine nesting/breeding Kingfisher presence or absence within 150m upstream or downstream of the bridge.
GC-PD-62	All bridges/structures where works are proposed will be subject to confirmatory surveys for General breeding birds prior to works commencing.
GC-PD-64	Tree felling only pertains to the Mountphilips Substation site. Confirmatory surveys will be carried out at all trees that will require felling or other major modifications (e.g. removal of rotten branches) in order to confirm the findings of the 2016 / 2017 surveys regarding the suitability of the trees for roosting bats. These trees will be subject to a ground-level visual inspection by the Project Ecologist (or a bat specialist acting on their behalf) prior to site clearance works.
GC-PD-65	While it is not expected that any trees with high suitability for roosting bats will be felled, the following measures will be implemented where a tree with moderate or high bat suitability is to be felled: a presence/absence bat surveys will be carried out; The Project Ecologist will supervise the installation of bat boxes in order to ensure that they are sited appropriately.
GC-PD-66	All bridges of moderate suitability for bats will be subject to a confirmatory survey prior to the commencement of construction works. Bridges of negligible or low suitability do not need to be surveyed, but this will be reviewed by the Environmental Clerk of Works and Project Ecologist.
GC-PD-67	No badger setts were recorded within 50m of the UWF Grid Connection during pre-planning surveys. Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced.
GC-PD-69	All covering of vegetative invasive knotweed infestations with high density polyethylene grass carpet terram will take place, at all identified locations prior to any works commencing on UWF Grid Connection or any other element of the Whole UWF Project. The covering of these infestations will only be carried out under the direct supervision of an ecologist with prior experience of this type of work i.e. this work cannot be carried out by any general construction staff.

UWF Grid Connection Monitoring Arrangements	
<p>Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM).</p> <p><i>(in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)</i></p>	
Traffic Management Plan	<ul style="list-style-type: none"> ▪ Along the 110kV UGC route on the public road, confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and FWD surveys will be undertaken ▪ Along the additional local road L5337-1 at Tullow, which will be used for construction materials haulage only (i.e. no trenching works), confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and FWD surveys will be undertaken along the routes of concentrated construction traffic between the R503 and the works locations on the local road network.
Surface Water Management Plan	<ul style="list-style-type: none"> ▪ Daily general visual inspections by Environmental Clerk of Works; ▪ Weekly (existing & new drains) inspections by site Construction Manager; ▪ All inspection to include all elements of drainage systems; ▪ Inspections required to ensure that drainage systems are operating correctly and to identify any maintenance that is required; ▪ Any changes, such as discolouration, odour, oily sheen or litter should be noted and corrective action should be implemented immediately. ▪ High risk locations such as settlement ponds will be inspected on a daily basis by the Construction Manager; ▪ Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; ▪ Event based inspections by the Environmental Clerk of Works as follows: <ul style="list-style-type: none"> ▪ >10 mm/hr (i.e. high intensity localised rainfall event); ▪ >25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or, ▪ Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). ▪ Weekly, Fortnightly and Monthly (depending on weather conditions and the nature of on-going construction works) site inspections by the Project Hydrologist during construction phase ▪ Water Quality Monitoring <ul style="list-style-type: none"> ▪ Daily field monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Clerk of Works. He/she will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. ▪ Regular (i.e. weekly or fortnightly depending on weather conditions) field monitoring will be carried out by the Project Hydrologist. ▪ Surface water quality will be monitored during the construction phase and this monitoring will also extend into the post construction phase. Proposed monitoring locations downstream of the works areas. The locations of the surface water monitoring points will be agreed with Inland Fisheries Ireland and Tipperary County Council in advance of the construction phase. ▪ Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory. ▪ Frequency of Water Quality Monitoring <ul style="list-style-type: none"> ▪ Daily visual checks at watercourse crossing locations where works are taking place; ▪ Weekly sampling for suspended solids and turbidity in catchments where earthworks or watercourse crossing work is on-going; ▪ Fortnightly sampling for the full suite of parameters in catchments where works are on-going; ▪ Event based sampling, e.g. after heavy rainfall; ▪ Additional sampling in the event of trigger level exceedance, after heavy rainfall, etc.; and,

UWF Grid Connection Monitoring Arrangements	
Environmental Survey requirements included as Project Design Measures, or as part of Management Plans or Best Practice Measures (BPM). (in some instances, only those parts of a PD/Management Plan/BPM relevant to monitoring is included below)	
	<ul style="list-style-type: none"> ▪ Post construction sampling programme (monthly sampling) for a period of six months
Invasive Species Management Plan	<ul style="list-style-type: none"> ▪ Pre-Construction confirmatory surveys will be completed by an invasive species specialist, 3 – 4 weeks before construction begins. Mapping, showing the most up to date distribution and extent of each infestation, will be distributed to the Client, Owners Engineer and the Contractor; ▪ The covering of vegetative knotweed infestations with high density polyethylene grass carpet terram at all identified locations prior to any works commencing on that section and the monitoring of construction works at that section when it happens; ▪ To ensure the effective implementation of the biosecurity measures, an invasive species specialist will monitor each infestation location during all critical stages of construction works; ▪ Visual inspections will be carried out on all machinery and equipment (particularly for machinery and equipment exiting the site and which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris.
Invasive Species Management Plan	<ul style="list-style-type: none"> ▪ During the operational phase: Before planned maintenance or unplanned repair works commence, an ecology or invasive species specialist will survey the works locations for invasive plant species infestations in proximity to the works location(s), ... the ecologist/invasive species specialist will supervise any works in proximity (5m) to infestations to ensure that construction machinery and operatives do not come into contact with these infestations;
GC-BPM-01 GC-BPM-02 GC-BPM-04 GC-BPM-05 GC-BPM-06 GC-BPM-07	<ul style="list-style-type: none"> ▪ The Construction Manager will be responsible for monitoring weather conditions ▪ All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments ▪ Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection ▪ Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase ▪ All permanent overburden storages areas will be checked / monitored daily until stabilised to ensure no drainage issues of surface water quality impacts are occurring
GC-BPM-08	<ul style="list-style-type: none"> ▪ Public roads works areas will be regularly inspected for cleanliness, and swept to remove mud and aggregate materials from their surface, as necessary; ▪ The private paved road in Knockcurraghbola Commons will also be regularly inspected for cleanliness, and swept to remove mud and aggregate materials from its surface, as necessary;
GC-BPM-09	Monitor the recruitment and training of local employees in line with Local Employment & Local Sourcing Policy
GC-BPM-10 GC-BPM-11	<ul style="list-style-type: none"> ▪ A confirmatory survey of Electromagnetic Field emissions from the Mountphilips 110kV Substation and from locations along the 110kV UGC will be carried out by a competent engineer following commissioning of the UWF Grid Connection ▪ Recording and reporting of the annual renewable electricity production of the operational Upperchurch Windfarm.

EIAR 14.4.3 Authorised UWF Grid Connection Conditions of Planning (Ref. 306204-19)

Condition 1: The development shall be carried out and completed in accordance with the plans and particulars lodged with the application, including the mitigation measures specified in the Environmental Impact Assessment Report, except as may otherwise be required in order to comply with the following conditions. Where such conditions require points of detail to be agreed with the planning authority, these matters shall be the subject of written agreement and shall be implemented in accordance with the agreed particulars. In default of agreement, the matter(s) in dispute shall be referred to An Bard Pleanála for determination.

Condition 2: The mitigation measures contained in the Natura impact statement which was submitted with the application shall be implemented in full.

Condition 3: The mitigation and monitoring measures and environmental commitments contained in Chapter 19 of the Environmental Impact Assessment Report which was submitted with the application shall be implemented in full.

Condition 4 (a): No additional artificial lighting shall be installed or operated on site unless authorised by a prior grant of planning permission.

(b); The substation and all related ancillary structures shall be dark green in colour.

Condition 5 (a): During the operational phase of the proposed development, the noise level arising from the development, as measured at the nearest noise sensitive location shall not exceed:

- (i) An LAeqT value of 55 dB(A) during the period 0800 to 2200 hours from Monday to Saturday inclusive. [The T value shall be one hour.
- (ii) An LAeqT value of 45 dB(A) at any other time. [The T value shall be 15 minutes]. The noise at such time shall not contain a tonal component.

At no time shall the noise generated on site result in an increase in noise level of more than 10 dB(A) above background levels at the boundary of the site.

(b): All sound measurement shall be carried out in accordance with ISO Recommendation R 1996 "Assessment of Noise with respect of Community Response" as amended by ISO Recommendations R 1996 1, 2 or 3 "Description and Measurement of Environmental Noise" as applicable.

Condition 6: The undertaker shall retain the services of a suitably qualified and experienced bird specialist to undertake appropriate surveys of this site for the Hen Harrier. Details of the surveys to be undertaken shall be submitted to, and agreed in writing with the planning authority prior to commencement of development.

Condition 7: The undertaker shall appoint a suitably qualified ecologist to monitor and ensure that all avoidance/mitigation measures relating to the protection of flora and fauna are carried out in accordance with best ecological practice and to liaise with consultants, the site contractor, the National Parks and Wildlife Service and Inland Fisheries Ireland. A report on the implementation of these measures shall be submitted to the planning authority and retained on file as a matter of public record.

Condition 8: Details of landscaping around the proposed Mountphilips substation and alongside the proposed access roadway to the substation, shall be submitted to and agreed in writing with, the planning authority, prior to commencement of development.

Condition 9: All works to protected structures, their curtilage and within their setting shall be supervised on an ongoing basis by a Grade I or II Conservation Architect and undertaken in accordance with the

conservation principles contained in the Architectural Heritage Protection Guidelines for Planning Authorities, October, 2011.

Condition 10: The undertaker shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the developer shall:

- (a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and
- (b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:

- the nature and location of archaeological material on the site, and
- the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works. In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Condition 11: Detailed measures in relation to the protection of bats at bridge crossings shall be submitted to and agreed in writing with the planning authority, prior to commencement of development. These measures shall be implemented as part of the development. Any envisaged destruction of structures that support bat populations shall be carried out only under licence from the National Parks and Wildlife Service and details of any such licence shall be submitted to the planning authority.

Condition 12: All proposed entrance or access points with the public road network shall comply with the detailed standards of the planning authority for such road works.

Condition 13: Water supply and drainage arrangements, including the disposal of surface water and wastewater, shall comply with the requirements of the planning authority for such works and services.

Condition 14: Prior to commencement of development, a detailed Construction Management Plan for the construction stage shall be submitted to, and agreed in writing with, the planning authority generally in accordance with the proposals set out in the Environmental Impact Assessment Report. The Construction Management Plan shall incorporate the following:

- (a) a detailed plan for the construction phase incorporating, inter alia, construction programme, supervisory measures, noise management measures, traffic management and road restoration measures, construction hours and the management of construction waste,
- (b) a comprehensive programme for the implementation of all monitoring commitments made in the application and supporting documentation during the construction period,
- (c) details of a pre-construction survey to identify/confirm the absence of any Hen Harrier nests within the subject site, and including a work cessation protocol including appropriate buffer in the vicinity of any identified nest, until the nest has been vacated at the end of the breeding season,
- (d) a Japanese Knotweed Management Plan,
- (e) an emergency response plan, and
- (f) proposals in relation to public information and communication.

A record of daily checks that the works are being undertaken in accordance with the Construction Management Plan shall be available for public inspection by the planning authority.

Condition 15: All road surfaces, culverts, bridges, watercourses, verges and public lands shall be protected during construction and, in the case of any damage occurring, shall be reinstated to the satisfaction of the planning authority. Prior to commencement of development, a road condition survey shall be taken to provide a basis for reinstatement works. Details in this regard shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Condition 16: Prior to commencement of development, the undertaker shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the relevant planning authority, to secure the reinstatement of public roads which may be damaged by the transport of materials to the site, coupled with an agreement empowering the relevant planning authority to apply such security or part thereof to the satisfactory reinstatement of the public road. The form and amount of the security shall be as agreed between the relevant planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination

EIAR 14.5 Mitigation, Monitoring and Licence Conditions for UWF Replacement Forestry

EIAR 14.5.1 UWF Replacement Forestry Project Design Measure (RF-PD)

UWF Replacement Forestry Project Design Measure (RF-PD)	
RF-PD 01	All planting and maintenance activities will be carried out during daylight hours
RF-PD 02	The lands will be planted by hand, using spades and hand tools.
RF-PD 03	No pesticide or fertilizer will be used at the UWF Replacement Forestry site.
RF-PD 04	There will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within the site.
RF-PD 05	A water setback from the watercourse which flows through the site will be established during planting works. The setback will be 10m from the edge of the watercourse. No planting or other works will be carried out in this 10m wide buffer area. Native woodland will be planted beyond this distance in accordance with Silvicultural Standards for Native Woodland Establishment GP9 & GP10 (Department of Agriculture, Food and the Marine, 2015).
RF-PD 06	No planting works will take place within 500m of an active hen harrier nest, or active nesting activity, during the months of March to August. Additionally, during the winter season, October to February, planting works will only be carried out during the period between one hour after sunrise and one hour before sunset in areas within 1000m of an active winter roost.
RF-PD 07	The lands will be protected from livestock by the perimeter fence.
RF-PD 08	Confirmatory surveys for active Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
RF-PD 09	All planting works within 150m of an active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer/outside of 1 hours after sunrise or before sunset during winter.
RF-PD 10	If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken <u>while cubs are present in the holt</u> and NPWS will be notified immediately
RF-PD 11	No wheeled vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under license.
RF-PD 12	The prohibited working area associated with otter holts will, where appropriate, be fenced with temporary fencing prior to any possibly invasive works and declared as 'out of bounds'. Fencing will be in accordance with Clause 303 of the NRA's Specification for Roadworks (National Roads Authority). Appropriate awareness of the purpose of the enclosure will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each exclusion fence. All contractors or operators on site will be made fully aware of the procedures pertaining to each affected holt (NRA, 2006) and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to Local Authorities and relevant Statutory Consultees.
RF-PD 13	Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary of identified badger setts to determine the current status of known badger setts (i.e. active or inactive) and to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced. NWPS will be notified immediately if the sett previously identified is confirmed as active or if a further active sett is located within 50 meters of the footprint of the development. If sett exclusion is required, this will be undertaken by an experienced ecologist under the necessary license and following best practice guidance (NRA, 2005).
RF-PD 14	No construction works will be carried within 50m of an active sett during the main breeding season (December 1 st to June 30 th).

UWF Replacement Forestry Project Design Measure (RF-PD)	
RF-PD 15	Planting works in the environs of a known active badger sett outside of the breeding period will follow NRA (2005) guidelines, i.e. wheeled vehicles will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances.

EIAR 14.5.2 UWF Replacement Forestry Monitoring Arrangements

An Environmental Clerk of Works will be employed during the planting stage to monitor the implementation of the environmental protection measures, listed above.

EIAR 14.5.3 Authorised UWF Replacement Forestry Licence Conditions

Technical Approval for an afforestation licence was granted approval subject to the following environmental conditions:

1. Compliance with Operational Proposals and Specifications enclosed (*with the application*).
2. Compliance with Departmental guidelines and requirements for Landscape, Water Quality, Harvesting, Biodiversity and Archaeology.
3. Compliance with Ecological Survey and Management Plan as submitted (if applicable).
4. This licence is issued subject to the terms and conditions of the Forestry Standards and Procedures Manual.
5. Additional Environmental & Silvicultural Considerations
 - Adhere to forestry & water quality guidelines,
 - All guidelines to apply

EIAR 14.6 Mitigation and Monitoring for UWF Other Activities

EIAR 14.6.1 UWF Other Activities Environmental Protection Measures

UWF Other Activities Environmental Protection Measures (OA-EM)	
OA-EM-01	Except with the approval of the National Parks and Wildlife Service: no activities will be carried out within 500 metres of an active hen harrier nest or nesting attempt; no activities will be carried out within 30m of an active main badger set or within 150m of an active otter holt.
OA-EM-02	In order to prevent disturbance to breeding birds, tree trimming for Haul Route Activities will be conducted outside of the bird breeding season.
OA-EM-03	Invasive Species monitoring in the form of confirmatory surveys will be carried out during the construction stage of the UWF Grid Connection, UWF Related Works and Upperchurch Windfarm to identify any infestations within or close to the relevant UWF Other Activity locations. Surveys will focus always on the activity location plus 7m and will be carried out ahead of any activities taking place. The measures included in the Invasive Species Management Plan for UWF Grid Connection and UWF Related Works will be implemented.
OA-EM-04	To minimise disturbance or displacement to lands, landowners will be contacted ahead of activities taking place on their lands and personnel involved in Overhead Line Activities or the Upperchurch Hen Harrier Scheme will ensure that the lands are left in at least as good condition than before the activity began. Activities will be carried out with minimum interference to land or livestock.
OA-EM-05	In order to protect water quality, Overhead Line Activities, Haul Route Activities and Upperchurch Hen Harrier Scheme activities which occur within 50m of a watercourse will be carried out during a dry spell of weather; a minimum buffer of 5m will be maintained between the activity and the watercourse where possible; straw bales will be placed between the activity location and the watercourse if there is a risk of sediment runoff from the activity (such as tree planting); all machinery or equipment used will be steam-cleaned before use at the location and checked for oil leaks prior to use; no refuelling of machinery or equipment will take place with 100m of a watercourse; access matting such as bog mats will be used in wet/boggy areas to provide access to vehicles, and any ground rutted by vehicles associated with UWF Other Activities will be repaired through loosening the compacted soil under any ruts with fork; any disturbed ground will be re-seeded immediately following the completion of the activity at a location.
OA-EM-06	In order to avoid the spread of invasive species, any infestation of invasive species will be dealt with, throughout the construction stage, with comprehensive Best Practice measures as outlined in the Invasive Species Management Plan (see Tab 4 of the UWF Grid Connection Environmental Management Plan). The Promoter of the UWF Grid Connection, Ecopower Developments Ltd, is also the Promoter of the Whole UWF Project, and as such will have full control over all construction practices for the works as the Promoter. Ecopower Developments is committed to implementing the Biosecurity Measures, which are described in the Invasive Species Management Plan, for all works and activities relating to the Whole UWF Project. These measures will also apply to any UWF Other Activities carried out during the operational or decommissioning stages.

EIAR 14.6.2 UWF Other Activities Monitoring Arrangements

These environmental protection measures (OA-EM-01 to OA-EM-06) will be implemented as part of the Upperchurch Windfarm, UWF Related Works and UWF Grid Connection and will be incorporated into their respective Environmental Management Plans. For example, measures listed above which are relevant to Haul Route Activities will be monitored through the UWF Related Works Environmental Management Plan.