Pinewoods Wind Farm Substation & Grid Connection

Schedule of Mitigation Measures

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Contents

1.0 Introduction

Galetech Energy Services (GES) has prepared this collated and consolidated Schedule of Mitigation Measures.

The proposed development site is located c. 1.2km north of the county boundary between County Laois and County Kilkenny in the townland of Knockardagur, County Laois; approximately 17km south-west of Portlaoise and 25km north of Kilkenny City, and approximately centred at Irish Transverse Mercator (ITM) Grid Reference 650427, 682395.

The proposed development will include:-

- A 110 kilovolt (kV) 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electrical substation with a 'split level' design, including 2 no. single-storey control buildings (with a Gross Floor Area of 589 square metres), 1 no. transformer bay, 2 no. line bays and all associated electrical equipment, services and lighting within an up to 2.95 metre high fenced compound (with a total footprint of 13,100 square metres);
- 2 no. lattice-type strain towers with a maximum height of up to 21m and approximately 70m of 110kV overhead electricity lines to facilitate connection of the proposed substation to the permitted 110kV Laois-Kilkenny Grid Reinforcement Project electricity transmission line (An Bord Pleanála Reference PL11.VA0015);
- Approximately 0.65km of on-site access track with associated site entrance from local public road (L77951); and
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure and surface water protection measures.

1.1 Purpose of this Report

Article 8(a)(4) of the Environmental Impact Assessment (EIA) Directive 2014/52/EU states:-

> *'...Member States shall ensure that the features of the project and/or measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment are implemented by the developer...'*

This document therefore provides a list of all mitigation measures proposed within **Volume I** of the EIAR which will be implemented during the construction, operational and decommissioning phases of the development.

For completeness, all mitigation measures set out in the Natura Impact Statement (NIS) are also provided at **Section 1.4** below.

1.2 Mitigation Measures

Pinewood Wind Limited ('the Applicant') can confirm that all mitigation measures outlined below will be implemented except as may be required in order to comply with other relevant conditions of consent.

It should be noted that a number of the below measures will be supervised and overseen by personnel who have not yet been appointed. Such personnel include:-

- Project Supervisor for the Construction Stage (PSCS);
- Civil Works Contractor;
- Electrical Works Contractor;

- Environmental Manager;
- Ecological Clerk of Works;
- Geotechnical Clerk of Works; and
- Archaeological Clerk of Works.

Each of the above will be procured prior to the commencement of development and will have ultimate responsibility for the implementation of all mitigation measures.

1.3 EIAR Mitigation Measures

It should be noted that the measures set out in respect of **Chapter 3** (Description of the Proposed Development) are inherent and fundamental to the design of the proposed development; however, have been provided here for completeness.

Topic	Mitigation Measure	Timing of Implementation
Description of the Proposed Development	The site entrance will be constructed in accordance with the requirements of the Local Authority, particularly regarding the provision of appropriate site visibility splays to ensure traffic safety.	Pre-Construction / Construction
Description of the Proposed Development	Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. The reinstatement of the site entrance will also incorporate the replanting of hedgerows with native species. Hedgerows will be appropriately sited to allow for future growth while ensuring, at all times, that visibility splays are maintained during the operational phase.	Construction
Description of the Proposed Development	Due to the sloping nature of the proposed development site, the substation design has incorporated a 'split level' design to substantially reduce the level of excavations which would have been necessary to provide for a single level compound. However, and notwithstanding the split level design, approximately 62,000m^3 of topsoil, subsoil and rock material will be excavated to provide a platform for the proposed substation and to allow for construction of the proposed access track. A cut/fill approach will be implemented to re-use, insofar as possible, material generated through excavations as fill. It is estimated that approximately 21,750m^3 will be re-used as fill in the construction of the substation footing and access track; while c. 7,000m^3 of topsoil material will be used in the reinstatement and landscaping of the proposed development site following the completion of construction activities.	Construction
Description of the Proposed Development	It is estimated that c. 33,250m^3 of excess material (topsoil, subsoil and rock material) will arise which cannot be re-used or accommodated within the proposed development site. Where excess material comprises suitable aggregates (estimated to be c. 5,900m^3), it is proposed to transport this material to the Pinewoods Wind Farm for use in the construction of access tracks and areas of hardstanding. The use of such material in the construction of the Pinewoods Wind Farm is a significant opportunity to utilise locally won material, of similar or identical geological composition, and to reduce the volume of construction traffic on the wider road network and associated vehicular emissions. Where excess material comprises topsoil or subsoil, it is proposed, where appropriate to do so, to re-use this material for reinstatement and landscaping purposes within the Pinewoods Wind Farm site for the purposes of:-	Construction

Topic	Mitigation Measure	Timing of Implementation
	• Resurfacing of hardstanding areas; • Reinstatement of site entrances; and • Trackside berms and landscaping. Appropriate locations for the deposition of this material will be carefully selected in accordance with **Section 2.3.5** and **2.3.6** of the preliminary Construction Environmental Management Plan (CEMP) enclosed at **Annex 3.4** (**Volume II**); in consultation with the on-site Ecological Clerk of Works (ECoW) and Environmental Manager (EM); ensuring that, at all times, water quality/siltation measures are fully implemented in advance and that the receiving site is suitable from a ground stability perspective. Spoil will be transported to these locations where it will be placed in accordance with best-practice methods to ensure the long-term stability of the stored material.	
Description of the Proposed Development	In the event that spoil cannot be reused either within the proposed development site or within the permitted Pinewoods Wind Farm, this material will be disposed of in an environmentally sensitive manner by a licensed waste contractor in consultation with the Planning Authority.	Construction
Description of the Proposed Development	The excavation of material to provide the requisite substation platform will result in the creation of cut faces on the northern and eastern boundaries on the substation footprint. Given the results of the site investigations undertaken to date and the presence of rock, it is possible that these will be retained as exposed rock faces and natural vegetation will, through time, colonise the faces. Due to the presence of rock, it is unlikely that retaining structures will be required, however, should same be deemed necessary by the Geotechnical Clerk of Works (GCoW); slope retention measures including gabion baskets, soil nailing or rock anchoring may be installed.	Construction
Description of the Proposed Development	Where construction materials and aggregates cannot be sourced on-site from construction excavations, they will be obtained from local quarries/suppliers. Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used.	Construction
Description of the Proposed Development	While the final selection of a precise construction material haul route to the site will be dependent on the chosen material supplier(s), all suppliers will be instructed to utilise the extensive national and regional road networks in counties Laois, Kilkenny	Construction

Topic	Mitigation Measure	Timing of Implementation
	and Carlow (as relevant) and to avoid local roads insofar as possible. In accordance with a scoping consultation response received from the Roads Design Office of Kilkenny County Council, the L1828 will not be used for the transportation of materials to the site and all suppliers will be prohibited from utilising this road.	
Description of the Proposed Development	The construction phase of the development will comprise a 6 no. day week with normal working hours from 08:00 to 20:00 Monday to Friday and 08:00 to 18:00 on Saturdays. It may be necessary to undertake occasional works outside of these hours to avail of favourable weather conditions or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.	Construction
Description of the Proposed Development	A preliminary Construction & Environmental Management Plan (CEMP) was prepared in respect of the entire Pinewoods Wind Farm as part of its planning application and is enclosed at **Annex 3.4** (**Volume II**). The methods and measures set out in the CEMP, regarding construction activities, will be implemented as relevant to the subject proposed development. A detailed CEMP, addressing the overall development (i.e. permitted wind farm and proposed development) will also be prepared in advance of all construction activities and will incorporate all mitigation measures proposed in this EIAR and will incorporate targeted Construction Method Statements (CMSs) prepared by the appointed Contractor in respect of each element of the proposed development. The preparation, application and documentation of this CEMP will enable all parties – including contractors, designers and competent authorities – to learn from the systematic implementation and assessment of best practice, particularly through the recording of summary information on performance outcomes.	Construction
Description of the Proposed Development	The construction phase will be supervised by a range of environmental and engineering specialist personnel including, but not limited to, a Project Supervisor for the Construction Stage (PSCS), ECoW and Archaeological Clerk of Works (ACoW) and GCoW who will liaise closely with the appointed Contractor's on-site EM to monitor and to ensure that all applicable measures are implemented. The detailed CEMP, which will incorporate further technical information following the undertaking of post-consent detailed design, will be submitted to the Planning Authority for	Construction

Topic	Mitigation Measure	Timing of Implementation
	approval prior to any works commencing on the proposed development site.	
Description of the Proposed Development	All surface water runoff shall be strictly controlled such that no silt or other pollutants enter water courses and that no artificially elevated levels of downstream siltation or plumes of silt arise when substratum is disturbed in accordance with the Fourth Schedule of the Regulations.	Construction
Description of the Proposed Development	Specific mitigation measures are presented in the relevant chapters of this EIAR in relation to each of these issues. The precise implementation and siting of these measures will be determined, subject to planning permission being granted, following the post-consent detailed design process and will be included within the CEMP to be agreed with the Planning Authority prior to the commencement of construction.	Pre-Construction
Description of the Proposed Development	During the construction phase, temporary stockpiles of excavated materials will be stored appropriately in designated areas of the site, within the catchment of the surface water drainage measures, in order to guarantee that no silt/sediment laden waters or deleterious matter enters surrounding surface water features. All surface water runoff from stockpiles, excavations or from dewatering operations will be passed through an appropriate attenuation train, including silt fences (also known as silt curtains), silt traps (also known as silt/settlement/stilling ponds) and settlement lagoons[1]. Other surface water protection measures which may be implemented, as appropriate, include silt bags and siltbusters. The installation these surface water runoff measures will avoid any discharge of silt or sediment laden waters directly to any surface water features prior to being fully treated. At the point of discharge, buffered outfalls (or level spreaders) will be installed to ensure that erosion or scouring does not occur. Further details of the proposed surface water protection measures are enclosed at **Chapter 7** and within the outline Surface Water Management Plan (SWMP) enclosed at **Annex 3.5** (**Volume II**).	Pre-Construction / Construction
Description of the Proposed Development	The outline SWMP, which will be further developed prior to commencement of development to incorporate any further immaterial design alterations and/or in response to any applicable conditions of consent, referred to above has been	Pre-Construction / Construction

[1] Please note that the titles of surface water protection infrastructure are used interchangeably within this EIAR and accompanying documentation.

Topic	Mitigation Measure	Timing of Implementation
	prepared in accordance with the overall surface water management measures contained within the SWMP prepared for the permitted Pinewoods Wind Farm (see **Volume II**, **Annex 3.4**, **Appendix B**). The Pinewoods Wind Farm SWMP sets out the overarching surface water management framework which will be implemented across the entire development, including the proposed development. The measures set out in the outline SWMP for the proposed development mirror those of the wind farm SWMP (which were assessed to be appropriate by An Bord Pleanála in respect of that development at this general location) but have been adapted to address the specific characteristics of the proposed development site. The outline SWMP has been prepared to provide consistent water protection measures to ensure that no deleterious matter is discharged, from either the permitted wind farm site or proposed development site, to the hydrological environment.	
Description of the Proposed Development	Storage areas for oils, chemicals and fuels will comprise bunded areas of sufficient capacity within the Pinewoods Wind Farm temporary construction compound. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any hydrocarbons that may be present. A 50m buffer will be observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone. From the construction compound, fuel will be transported to the works area by a 4x4 in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity.	Construction
Description of the Proposed Development	Waste disposal measures proposed include:- • On-site segregation of all waste materials into appropriate categories including, for example, topsoil, bedrock, concrete, bricks, tiles, oils /diesels, metals, dry recyclables e.g. cardboard, plastic, timber; • All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound; • Wherever possible, left over materials (e.g. timber off-cuts) shall be re-used on-	Construction

Topic	Mitigation Measure	Timing of Implementation
	site; • Uncontaminated excavated material (rock, topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill; • Based on site investigations, rock is likely to be encountered during excavations and will be utilised during construction; • All waste leaving the site will be transported by approved and licensed contractors and taken to suitably licensed facilities and will be recycled, recovered or reused, where possible; and • All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.	
Description of the Proposed Development	Construction traffic on the local road network will be managed in accordance with a Traffic Management Plan and the requirements of the Local Authority. This may include the installation of temporary road signage and traffic lights, as appropriate.	Construction
Description of the Proposed Development	Waste will be generated during the operational phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best-practice and all regulations in a licensed facility.	Operational
Population & Human Health	Allowing for the implementation of mitigation set out elsewhere within this EIAR, no likely significant adverse effects have been identified in respect of socio-economic receptors arising from construction, operation or decommissioning of the proposed development and therefore no mitigation measures are required to reduce or remedy any effect.	Construction / Operational
Biodiversity	The iterative design process applied to the development has incorporated a series of design principles, good practice environmental and pollution control measures in line with current industry good practice guidance and 'designed-in' mitigation.	Construction / Operational
Biodiversity	An outline Construction Environmental Management Plan (CEMP) has been prepared and incorporates site specific environmental protection and pollution prevention measures.	Construction
Biodiversity	A site specific surface water drainage design, incorporating the principles of Sustainable Drainage Systems (SuDS), has been prepared for the development. The	Construction / Operational

Topic	Mitigation Measure	Timing of Implementation
	design includes surface water drainage infrastructure to ensure that deleterious matter will not be discharged to the Knockardagur Stream.	
Biodiversity	The lighting design for the development has minimised the number of lamp posts/lights in order to minimise light pollution and light intensity. The proposed lamp posts/lights are cowled to ensure that adjacent vegetation is not illuminated. The substation lighting will only be used when maintenance personnel are present.	Operational
Biodiversity	Landscaping measures are incorporated into the design of the proposed development. These are listed in full in **Chapter 9** of this EIAR and include features to minimise loss of biodiversity on-site. Such measures include the following:- • Any hedgerows that are to be retained will be protected from damage during construction; • The hedgerows will be planted atop the embankment along the northern and eastern boundaries of the proposed substation. The hedgerow species will reflect the species composition of hedgerows being removed and those being retained; • The hedgerows along the southern and western boundaries of the proposed substation will be retained and will be supplemented by additional planting as appropriate; and • Hedgerows within the Site will be managed post-construction to maintain a height of approximately 3-4 m.	Operational
Biodiversity	The Surface Water Management Plan (SWMP) and detailed drainage design for the development incorporates a large number of tried and tested measures that are used as standard by industry for protection of water quality. The design and mitigation measures are set out in detail in the SWMP but can be summarised as measures to prevent sediment release to surface water features during the construction phase of the development. The SWMP standard measures also include regulation of flow to prevent scouring and allow settlement of sediment to occur.	Construction / Operational
Biodiversity	Erosion and sediment control will be put in place to protect the Knockardagur stream before commencement of any site clearance and earthworks. Exposed soil is to be kept to a minimum throughout construction to further reduce risk of sediment release during rainfall events. Vegetation cover will be re-established as soon as	Construction / Operational

Topic	Mitigation Measure	Timing of Implementation
	practical on all areas where soil has been exposed. Erosion and sediment controls will be monitored and maintained on a continuous basis throughout the construction phase.	
Biodiversity	Surface water will pass through interception, such as silt traps, to ensure suspended solids will not reach any watercourses.	Construction
Biodiversity	Silt traps/settlement ponds and temporary interceptors and traps will be put in place on site prior to any site clearance/earthworks and will be used until such time as permanent facilities are constructed.	Construction
Biodiversity	All fuels, lubricants and hydraulic fluids will be kept in secure bunded areas, within the permitted Pinewoods Wind Farm construction compound, away from watercourses. The bunded area will accommodate 110% of the total capacity of the containers within it.	Construction
Biodiversity	Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place and spill kits provided with all staff properly briefed and trained.	Construction
Biodiversity	Any waste oils or hydraulic fluids will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.	Construction
Biodiversity	Fuelling and lubrication will not be conducted within 50 m of any surface water feature including the Knockardagur stream.	Construction
Biodiversity	Attenuation ponds have been designed to accommodate Greenfield runoff rates + 20% for climate change.	Construction
Biodiversity	The measures described in Altmüller and Dettmer (2006) to protect water quality within freshwater pearl mussel catchments have been adapted for the proposed development and are incorporated in the SWMP. It is not proposed to adopt the measures in full but, instead, to adapt and implement them in accordance with the characteristics of the Site.	Construction
Biodiversity	Disturbed Sediment Entrainment Mats - SEDIMATS (see http://www.hy-tex.co.uk/ht_bio_sed.html) will be used in the Knockardagur stream. These will be installed according to the manufacturer's instructions at suitable locations along the stream.	Construction

Topic	Mitigation Measure	Timing of Implementation
Biodiversity	In advance of any works taking place, the appointed contractor will be required to finalise the CEMP and provide site-specific. Method Statements detailing specific measures to protect the surface water drainage network. The final CEMP, along with the SWMP, will be submitted to and agreed with the Planning Authority.	Construction
Biodiversity	All storage containers will be labelled appropriately, including hazardous markings.	Operational
Biodiversity	All holding tanks will be constructed of material appropriate for fuel/chemical storage and will be bunded to at least 110% of the maximum tank volume or 25% of the total capacity of all the tanks within the bund, whichever is greatest.	Operational
Biodiversity	Bunds will be to standard specified in CIRIA Report 163 '*Construction of bunds for oil storage tanks*' and CIRIA Report C535 '*Above-ground proprietary prefabricated oil storage tank systems*'.	Operational
Biodiversity	Barrels and bunded containers will be stored upright and internally where appropriate and always on drip trays or sump pallets.	Operational
Biodiversity	Appropriate spill kits will be available at all storage locations.	Operational
Biodiversity	All fuel/chemical storage facilities will be subject to weekly inspection.	Operational
Biodiversity	Leaking or empty drums will be removed from the Site immediately and disposed of via a registered waste disposal contractor.	Operational
Biodiversity	The loss of small sections of hedgerow during the construction phase will be mitigated by the 'designed-in' measures outlined in **Section 5.4.** These measures involve replanting and, where appropriate, the bolstering or reinforcing of existing hedgerows.	Construction / Operational
Biodiversity	The protection of water quality during the construction phase will be addressed by the incorporation of surface water management measures, as outlined in **Sections 5.5.1** and **5.5.1.1**, into the design of the development. These measures are tried and tested and are used as standard by industry for protection of water quality. These measures prevent sediment release to surface water features along with regulation of flow to prevent scouring and allow settlement of sediment to occur.	Construction / Operational
Biodiversity	Bats are highly mobile animals that use a number of roost sites within and between years. Bats use different parts of the tree for different reasons, depending on the time	Pre-Construction / Construction

Topic	Mitigation Measure	Timing of Implementation
	of year and temperature. Trees identified with Potential Roost Features (PRF) during the site visit in April 2020 will be clearly marked and at pre-construction stage these trees be visually inspected from the ground, as a minimum, during the daytime to check for signs of use by bats and to revaluate their suitability for bats. This inspection and evaluation will be informed by the findings of the survey work in April 2020. The trees will be inspected by a suitably qualified and experienced ecologist sufficiently in advance of felling so that there is sufficient time to seek a derogation licence, if required, in advance of felling. The appointed ecologist will also advise on the need, if any, for additional pre-construction bat surveys based on the findings of their daytime inspection. In the event that bats are present, or it is clear that the tree is used by roosting bats, in a tree to be removed, a derogation licence will be obtained from the NPWS prior to tree removal. The licence application would be supported by a Method Statement detailing appropriate measures to ensure no bat is harmed during the felling of the trees. Mitigation measures for the loss of the roost would also be provided. All of the trees will be visually inspected again within 48 hours of tree removal and removal will be carried out under the supervision of the ecologist named on the derogation licence.	
Land & Soils	Excavated soil will be side cast and stored temporarily adjacent to excavation areas for use during reinstatement and landscaping.	Construction
Land & Soils	Silt fences will be installed around all temporary stockpiles to limit movement of entrained sediment in surface water runoff. All slopes will be sealed with the bucket of an excavator.	Construction
Land & Soils	In order to minimise runoff during the construction phase, works will not take place during periods of intense or prolonged rainfall (to prevent increased silt laden runoff). Drainage systems, as outlined in **Chapter 7**, will be implemented to limit runoff effects during the construction phase.	Construction
Land & Soils	Bog mats will be used, as necessary, to support construction plant and machinery on soft ground, thus reducing the likelihood for soil and subsoil erosion and avoiding the formation of rutted areas. This will substantially reduce the likelihood for surface water ponding to occur.	Construction

Topic	Mitigation Measure	Timing of Implementation
Land & Soils	The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compound at the Pinewoods Wind Farm. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor.	Construction
Land & Soils	All bunded areas will have 110% capacity of the volume to be stored.	Construction
Land & Soils	On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations to avoid any accidental leakages.	Construction
Land & Soils	All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose.	Construction
Land & Soils	Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.	Construction
Land & Soils	An emergency plan for the construction phase to deal with accidental spillages is contained within the Outline Construction and Environmental Management Plan (**Annex 3.4**). This emergency plan will be further developed by the contractor prior to the commencement of construction.	Construction
Land & Soils	All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose.	Construction
Land & Soils	Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.	Construction
Land & Soils	Following the completion of construction activities and the reseeding of exposed soil as a result of excavations, it is assessed that due to the absence of likely soil erosion	Operational

Topic	Mitigation Measure	Timing of Implementation
	effects, no mitigation measures are required. Oil used in transformers (and other electrical apparatus) and storage of hydrocarbons could result in leakages during the operational phase and result in effects on soil and subsoils. The transformer and any hydrocarbon storage areas will be located in a roofed concrete bund capable of holding 110% of the stored oil volume. The electrical control buildings will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor.	
Water	The overarching objective of the proposed mitigation measures is to ensure that all surface water runoff is comprehensively attenuated such that no silt or sediment laden waters or deleterious material is discharged into the local drainage system. A Surface Water Management Plan (SWMP), incorporating the surface water drainage design has been prepared, see **Annex 3.5** (**Volume II**), and incorporates the principles of Sustainable Drainage Systems (SuDS) through an arrangement of surface water drainage infrastructure. The SWMP has had regard to greenfield runoff rates and has been designed to mimic same and is sufficient to accommodate a 1-in-100 year rainfall event.	Construction / Operational
Water	While the SuDS, overall, is an amalgamation of a suite of drainage infrastructure; the overall philosophy is straightforward. In summary:- • All surface water runoff will be directed to specially constructed swales surrounding all areas of ground proposed to be disturbed (including areas for the temporary storage of material); • The swales will direct runoff into settlement ponds and, subsequently, lagoon-type sediment ponds where silt/sediment will be allowed to settle; and • Following the settlement of silt/sediment, clean water will be discharged to the local drainage network via buffered outfalls thus ensuring that no scouring occurs.	Construction / Operational
Water	The design criteria implemented as part of the SuDS are as follows:- • To minimise alterations to the ambient site hydrology and hydrogeology;	Construction / Operational

Topic	Mitigation Measure	Timing of Implementation
	• To provide settlement and treatment controls as close to the site footprint as possible and to replicate, where possible, the existing hydrological environment of the site; • To minimise sediment loads resulting from the development run-off during the construction phase; • To preserve greenfield runoff rates and volumes; • To strictly control all surface water runoff such that no silt or other pollutants shall enter watercourses and that no artificially elevated levels of downstream siltation or no plumes of silt arise when substratum is disturbed; • To provide settlement ponds to encourage sedimentation and storm water runoff settlement; • To provide lagoon-type sediment traps which adhere to the design principles outlined by Altmuller and Dettmer (2006). It is not proposed to adopt, in full, the recommendations of Altmuller and Dettmer but to adapt the overall principles as applicable to the proposed development site. These lagoon-type ponds will absorb the fine particles, which may not settle in the primary settlement ponds; • To reduce stormwater runoff velocities throughout the site to prevent scouring and encourage settlement of sediment locally; • To manage erosion and allow for the effective revegetation of bare surfaces; and • To manage and control water within the site and allow for the discharge of runoff from the site within the limits prescribed in the Freshwater Pearl Mussel and Salmonid Regulations.	
Water	Prior to the commencement of construction activities, silt fencing will be placed along the western boundary of the proposed development site and up-gradient of the Knockardagur stream. It is important to note that no construction activities will commence until all necessary preliminary water quality protection measures have been implemented to the satisfaction of the Ecological Clerk of Works (ECoW) and Environmental Manager (EM).	Construction
Water	All necessary preventative measures, set out in this chapter and the Surface Water Management Plan (see **Annex 3.5**) will be implemented to ensure no entrained sediment, or deleterious matter, will enter the Knockardagur stream or other	Construction

Topic	Mitigation Measure	Timing of Implementation
	watercourse/existing drain.	
Water	Disturbed Sediment Entrainment Mats - SEDIMATS (see http://www.hy-tex.co.uk/ht_bio_sed.html) will also be used in the Knockardagur stream. These will be installed according to the manufacturer's instructions at suitable locations on the stream.	Construction
Water	The silt fences will be embedded into the local soils to ensure all site water is captured and directed to the surface water drainage system.	Construction
Water	As construction works progress through the site towards the substation footprint, water protection measures will be implemented.	Construction
Water	Discharge to ground will be via a buffered outfall arrangement e.g. silt bag which will filter any remaining sediment from the pumped water.	Construction
Water	No pumped construction water will be discharged directly into local streams and all surface water runoff will be fully treated prior to discharge.	Construction
Water	Installation of upslope interceptor drainage to keep clean surface water runoff away from works areas.	Construction
Water	Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge area will be completed by the EM throughout the construction phase.	Construction
Water	If high levels of silt or other contamination is noted in the water treatment systems, all construction works will be immediately stopped. No works will recommence until the issue is resolved, to the satisfaction of the EM, and the cause of the elevated source is fully remedied.	Construction
Water	Earth works will be scheduled to take place during periods of low rainfall to reduce run-off and possible siltation of watercourses.	Construction
Water	The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001). The guidance contained within this document will be strictly implemented and enforced on-site which will ensure that surface water	Construction

Topic	Mitigation Measure	Timing of Implementation
	arising during the course of construction activities will contain minimum sediment.	
Water	General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates.	Construction
Water	Meteo Alarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale.	Construction
Water	3 hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events.	Construction
Water	Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3 hour record is given and is updated every 15 minutes. Radar images are not predictive.	Construction
Water	Consultancy Service: Met Eireann provide a 24 hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.	Construction
Water	Works will be suspended if forecasting suggests either of the following is likely to occur:- • >10 mm/hr (i.e. high intensity local rainfall events); • >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, • >half monthly average rainfall in any 7 days.	Construction
Water	Prior to works being suspended, the following control measures should be completed:- • Secure all open excavations; • Provide temporary or emergency drainage to prevent back-up of surface runoff; and, • Avoid working during heavy rainfall and for up to 24 hours after heavy events	Construction

Topic	Mitigation Measure	Timing of Implementation
	to ensure drainage systems are not overloaded.	
Water	Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations, will be put in place.	Construction
Water	The interceptor drainage will be discharged to the site constructed drainage system and not directly to surface waters to ensure that Greenfield runoff rates are mimicked.	Construction
Water	If required, pumping of excavation inflows will prevent build up of water in the excavation.	Construction
Water	All pumped water will be directed to the surface water drainage system for treatment prior to discharge.	Construction
Water	There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur.	Construction
Water	Daily monitoring of site excavations by the EM will occur during the construction phase. If high levels of seepage inflow occur, excavation work at this location will cease immediately and a geotechnical assessment undertaken.	Construction
Water	A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.	Construction
Water	The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compound at the Pinewoods Wind Farm site and will be transported to the proposed development site as required. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor.	Construction
Water	All bunded areas will have 110% capacity of the volume to be stored.	Construction
Water	On site re-fuelling of machinery will be carried out using a mobile double skinned fuel	Construction

Topic	Mitigation Measure	Timing of Implementation
	bowser. The fuel bowser, a double-axel custom-built refuelling trailer, will be re-filled at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations to avoid any accidental leakages.	
Water	All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose.	Construction
Water	Spill kits will be readily available to deal with and accidental spillage.	Construction
Water	All waste tar material arising from road cuttings (as may be required in the construction of the site entrance) will be removed off-site and taken to a licensed waste facility. Due to the possibility of contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works.	Construction
Water	An outline emergency plan for the construction phase to deal with accidental spillages is contained within the preliminary CEMP (**Annex 3.4**). This emergency plan will be further developed prior to the commencement of development, and will be agreed with the Planning Authority as part of the detailed CEMP.	Construction
Water	Self contained port-a-loos (chemical toilets) with an integrated waste holding tank will be installed at the Pinewoods Wind Farm temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works.	Construction
Water	Water supply for the site office and other sanitation will be brought to site and removed after use to be discharged at a suitable off-site treatment location.	Construction
Water	No water will be sourced on the site, nor will any wastewater be discharged to the site.	Construction
Water	No batching of wet-cement products will occur on site. Ready-mixed concrete will be brought to site as required and, where possible, emplacement of pre-cast products, will take utilised.	Construction

Topic	Mitigation Measure	Timing of Implementation
Water	Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. Chute cleaning will be undertaken at lined cement washout ponds within the Pinewoods Wind Farm temporary construction compound with waters being tankered off site and disposed of at an approved licensed facility. There will be no discharge of cement contaminated waters to the construction drainage system or to any drain or watercourse.	Construction
Water	Weather forecasting will be used to ensure that prolonged or intense rainfall is not predicted during concrete pouring activities.	Construction
Water	The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.	Construction
Water	During the operational phase, stormwater from the proposed development site will be discharged to ground via soakaways following attenuation.	Operational
Water	Stormwater discharge from the proposed development site will be limited to greenfield runoff rates, therefore there will be no increase in storm water runoff rates entering the local environment.	Operational
Water	Runoff from the control building areas will be also be passed through an oil interceptor to prevent any discharge of hydrocarbons.	Operational
Water	It is likely that minor volumes of groundwater seepage will arise from the cut slopes. This water will be directed into the surface water management system for appropriate treatment prior to discharge.	Operational
Water	All storage containers will be labelled appropriately, including hazardous markings.	Operational
Water	All holding tanks will be constructed of material appropriate for fuel/chemical storage and will be bunded to at least 110% of the maximum tank volume or 25% of the total capacity of all the tanks within the bund, whichever is greatest.	Operational
Water	All bulk tanks will be located within an impervious bund.	Operational
Water	Bunds will be to standard specified in CIRIA Report 163 'Construction of bunds for oil storage tanks' and CIRIA Report C535 'Above-ground proprietary prefabricated oil storage tank systems.	Operational

Topic	Mitigation Measure	Timing of Implementation
Water	Barrels and bunded containers will be stored upright and internally where appropriate and always on drip trays or sump pallets.	Operational
Water	Appropriate spill kits will be available at all storage locations.	Operational
Water	All fuel/chemical storage facilities will be subject to weekly inspection.	Operational
Water	Leaking or empty drums will be removed from the site immediately and disposed of via a registered waste disposal contractor.	Operational
Air Quality & Climate	A detailed Dust Minimisation Plan will be formulated prior to the construction phase of the project. Measures to be included within the detailed Dust Minimisation Plan include:- • Access tracks and public roads in the vicinity of the site shall be regularly cleaned to remove mud, aggregates and debris and maintained as appropriate. All road sweepers shall be water assisted; • Any access track that may give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions; • Vehicles delivering materials, which could give rise to dust, shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust; • In the event of dust nuisance occurring outside the site boundary, movement of materials will be immediately terminated and satisfactory procedures implemented to rectify the problem before the resumption of operations; • Public roads in the vicinity of the site shall be regularly inspected for cleanliness and cleaned as necessary; • If issues persist and the above measures are not satisfactorily control dust emissions, a wheel washing system with rumble grids to dislodge accumulated dust and mud prior to leaving the site should be installed; and The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.	Construction
Landscape	Aside from standard practice construction stage measures to minimise land and vegetation disturbance (such as clearly delineating the works area) and dust	Construction

Topic	Mitigation Measure	Timing of Implementation
	emissions (through damping down of access tracks if necessary), there are no specific landscape & visual mitigation measures to be implemented. The appropriate management and reinstatement of shallow excavations, in a timely manner, will ensure that any adverse effects caused, for example at the proposed site entrance, are minimised insofar as possible. Similarly, the progressive reinstatement and landscaping of the site will remediate any short term adverse effects on the local landscape. As part of the reinstatement and landscaping process, planting of hedgerows will also be completed at the site entrance. This planting will be located sufficiently behind the visibility splay to allow for future growth and will ensure that extensive views of the proposed development are not afforded from the local road.	
Landscape	Any vegetation which is not required to be removed to facilitate the proposed site entrance and access tracks within the site or at the interface with the local road, will be retained and avoided insofar as possible during construction. In terms of planting, the following is proposed:- • New hedgerows will be planted atop the embankment along the northern and eastern boundaries of the proposed substation. The species to be will, in the first instance, be agreed with the Ecological Clerk of Works and will be selected to reflect the species composition of existing adjacent hedgerows. The species mix is likely to comprise low growing woody species of local provenance including Blackthorn, Hawthorn and Hazel; • The hedgerows along the southern and western boundaries of the proposed substation will be retained and will be supplemented by additional planting where deemed appropriate. Proposed species will be whip species to complement the existing broadleaf hedgerow species mix around the site and will be of local provenance; and • It is intended to manage and maintain proposed hedgerows at c. 3-4m in height. The strategy for the exposed cut faces, exposed while constructing the level platform for the proposed substation, is to encourage natural regeneration. This will mean, by default, the most suitable species for the conditions will colonise and will help the raw cut face to blend into its surroundings. Areas of ground disturbed during the construction phase will be will be seeded with	Operational

Topic	Mitigation Measure	Timing of Implementation
	suitable grass and wildflower seed mix.	
Cultural Heritage	Archaeological monitoring of all excavations associated with the construction of the proposed development shall be carried out. Monitoring will be carried out under licence to the Department of Culture, Heritage and the Gaeltacht and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring.	Construction
Noise & Vibration	It is proposed that various practices will be adopted during construction as required, including the following:- • Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; • Establishing channels of communication between the contractor/developer, local authority and residents; • Appointing a site representative responsible for matters relating to noise and vibration; • Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; and • Keeping site access tracks even to mitigate the likelihood of vibration from HGVs. Furthermore, a variety of practical noise control measures will be employed. These include:- • Selection of plant with low inherent likelihood of generation of noise and/or vibration; • Placing of noisy/vibratory plant as far away from sensitive properties as permitted by site constraints, and; Regular maintenance and servicing of plant items.	Construction
Noise & Vibration	The contractors involved in the construction phase will be obliged, under contract, to undertake specific noise abatement measures and comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*. The following list of measures will be implemented, as relevant, to ensure compliance with the relevant construction noise criteria:-	Construction

Topic	Mitigation Measure	Timing of Implementation
	• No plant or machinery will be permitted to cause a public nuisance due to noise; • The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. • All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract; • Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; • Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use; • Any plant, such as generators or pumps, which may be required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen; • During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in **Table 11.1** using methods outlined in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*; • The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 08:00 and 20:00 Monday to Friday and between 08:00hrs and 18:00hrs on Saturdays, with no operations on Sundays or public holidays.	
Noise & Vibration	Based on assessment of the geological composition of the site, it is concluded that rock-breaking will not be required. In the unlikely event that rock breaking is necessary, the following measures will be implemented to mitigate noise emissions:- • Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency; • Ensure all air lines are sealed; • Use a dampened breaking bit to eliminate a 'ringing' sound; and • Erect an acoustic screen around breaking activities. Where possible, line of sight between top of machine and reception point should be obscured.	Construction

Topic	Mitigation Measure	Timing of Implementation
Noise & Vibration	Noise emissions associated with the proposed development during the operational phase will not be significant and are predicted to be well within the criteria set out in **Section 11.3.2**. Therefore, no mitigation measures are required.	Operational
Shadow Flicker	Mitigation measures proposed by the Applicant in respect of the Pinewoods Wind Farm were accepted by the Board[2]; and given that a significant increase in shadow flicker effects will not occur, it is assessed that these mitigation measures remain an appropriate means to avoid likely significant shadow flicker effects. It can be confirmed, therefore, that all measures proposed and set out in the Board Order[3] will be implemented in full	Operational
Shadow Flicker	Technological mitigation is available, and widely implemented, on wind farm developments where shadow flicker levels are proven to be in excess of the recommended limits. These mitigation measures effectively limit the operation of turbines during the infrequent and rare periods when shadow flicker occurs. In short, if a particular turbine is creating shadow flicker effects at a particular receptor, then that turbine may be temporarily curtailed. This is usually achieved by turning off the turbines at predetermined times, as predicted by the shadow flicker model, when shadow flicker is proven to occur. The wind turbines will each be fitted with shadow flicker curtailment software to facilitate their shut down as required. If the sun is shining, the software will turn off the turbine at the predetermined times when shadow flicker is predicted to occur based on the prediction model. This approach will be implemented, as necessary, to ensure that actual levels of shadow flicker do not exceed either of the relevant limits. In particular, the operation of the permitted wind turbines will be curtailed to ensure that no dwelling experiences shadow flicker in excess of 30 minutes on any given day.	Operational
Material Assets (Transport & Access)	Traffic movements will be limited to 08:00 - 20:00 Monday to Friday and 08:00 – 18:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours to avail of favourable weather conditions or in the event of an emergency. Where construction	Construction

[2] Section 7.5.3 of Inspector's Report pursuant to An Bord Pleanála Reference PL11.248518.

[3] Condition 20 of Board Order pursuant to An Bord Pleanála Reference PL11.248518.

Topic	Mitigation Measure	Timing of Implementation
	activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.	
Material Assets (Transport & Access)	Wheel washing equipment (e.g. dry ramp system) will be used, as necessary, to prevent any debris being transferred from site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the construction site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions.	Construction
Material Assets (Transport & Access)	A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Local Authority prior to the commencement of development.	Pre-Construction
Material Assets (Transport & Access)	All reasonable steps shall be taken to ensure that motorway, national and regional routes are used to transport all materials to/from the site, in so far as is possible. Local roads in the vicinity of the proposed development site, in particular the L77951 between the proposed development site and the Pinewoods Wind Farm, will be regularly inspected to ensure that the structural integrity of the road is not adversely affected due to HGV movements. Should a deterioration in the road condition be identified, remedial measures, in agreement with the local authority, will be implemented.	Construction
Material Assets (Transport & Access)	All reasonable steps shall be taken to ensure that only national and regional routes are used to transport all materials to the site, in so far as is possible.	Construction
Material Assets (Transport & Access)	The L1828 will not be used for the transportation of materials to the site and all suppliers will be prohibited from utilising this road.	Construction
Material Assets (Transport & Access)	The proposed site entrance will be reinstated in a manner which ensures that the requisite visibility splays and road safety are maintained.	Construction
Material Assets (Transport & Access)	Adequate signage shall be provided providing access, safety and warning information.	Construction
Material Assets (Transport & Access)	Traffic disruption shall be kept to minimum duration and extent.	Construction

Topic	Mitigation Measure	Timing of Implementation
Material Assets (Transport & Access)	A designated contact point and coordinator will be put in place to manage all access arrangement and to interface with the public and the Local Authority.	Pre Construction / Construction
Material Assets (Transport & Access)	A designated contact point and coordinator will be put in place to manage all access arrangement and to interface with the public and the Local Authority.	Construction
Material Assets (Transport & Access)	The site shall be closed to the public during the construction phase.	Construction
Material Assets (Aviation)	Due to the absence of tall structures and likely aviation effects, there are no specific mitigation measures during the construction, operation or decommissioning phases.	Construction / Operational
Material Assets (Telecommunications)	While the overall project (proposed development plus permitted Pinewoods Wind Farm) is assessed as unlikely to interfere with any microwave links, all operators will be kept informed of any changes to the precise positioning of infrastructure to ensure that compliance with telecommunication constraints is maintained. If, despite precautions, telecommunication interference in any form is identified and is attributed to the project, appropriate remedial measures will immediately be undertaken. A range of technical measures are available to mitigate any instances of interference including signal amplifiers, active deflectors and relay transmitters, repeater stations, booster units, realignment of domestic aerials, installation of higher quality aerials and the installation of suppression equipment. Remedial works will be promptly undertaken to ensure uninterrupted telecommunication, broadcasting and mobile phone service provision..	Operational
Material Assets (Telecommunications)	There are no specific mitigation measures during the construction, operation or decommissioning phases.	Construction / Operational

1.4 NIS Mitigation Measures

Topic	Mitigation Measure	Timing of Implementation
Water Quality	The Surface Water Management Plan (SWMP) and detailed drainage design for the development incorporates a large number of tried and tested measures that are used as standard by industry for protection of water quality. The design and	Construction

Topic	Mitigation Measure	Timing of Implementation
	mitigation measures are set out in detail in the SWMP but can be summarised as measures to prevent sediment release to surface water features during the construction phase of the development. The SWMP standard measures also include regulation of flow to prevent scouring and allow settlement of sediment to occur.	
Water Quality	Erosion and sediment control will be put in place to protect the Knockardagur stream before commencement of any site clearance and earthworks. Exposed soil is to be kept to a minimum throughout construction to further reduce risk of sediment release during rainfall events. Vegetation cover will be re-established as soon as practical on all areas where soil has been exposed. Erosion and sediment controls will be monitored and maintained on a continuous basis throughout the construction phase.	Construction
Water Quality	Surface water will pass through interception, such as silt traps, to ensure suspended solids will not reach any watercourses.	Construction
Water Quality	Silt traps/settlement ponds and temporary interceptors and traps will be put in place on site prior to any site clearance/earthworks and will be used until such time as permanent facilities are constructed.	Construction
Water Quality	All fuels, lubricants and hydraulic fluids will be kept in secure bunded areas, within the permitted Pinewoods Wind Farm construction compound, away from watercourses. The bunded area will accommodate 110% of the total capacity of the containers within it.	Construction
Water Quality	Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place and spill kits provided with all staff properly briefed and trained.	Construction
Water Quality	Any waste oils or hydraulic fluids will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.	Construction
Water Quality	Fuelling and lubrication will not be conducted within 50 m of any surface water feature including the Knockardagur stream.	Construction
Water Quality	Attenuation ponds have been designed to accommodate Greenfield runoff rates + 20% for climate change.	Construction
Water Quality	The measures described in Altmüller and Dettmer (2006) to protect water quality	Construction

Topic	Mitigation Measure	Timing of Implementation
	within freshwater pearl mussel catchments have been adapted for the proposed development and are incorporated in the SWMP. It is not proposed to adopt the measures in full but, instead, to adapt and implement them in accordance with the characteristics of the Site.	
Water Quality	Disturbed Sediment Entrainment Mats - SEDIMATS (see http://www.hy-tex.co.uk/ht_bio_sed.html) will be used in the Knockardagur stream. These will be installed according to the manufacturer's instructions at suitable locations along the stream	Construction
Water Quality	In advance of any works taking place, the appointed contractor will be required to finalise the CEMP and provide site-specific. Method Statements detailing specific measures to protect the surface water drainage network. The final CEMP, along with the SWMP, will be submitted to and agreed with the Planning Authority.	Construction
Water Quality	All storage containers will be labelled appropriately, including hazardous markings.	Operational
Water Quality	All holding tanks will be constructed of material appropriate for fuel/chemical storage and will be bunded to at least 110% of the maximum tank volume or 25% of the total capacity of all the tanks within the bund, whichever is greatest.	Operational
Water Quality	Bunds will be to standard specified in CIRIA Report 163 'Construction of bunds for oil storage tanks' and CIRIA Report C535 'Above-ground proprietary prefabricated oil storage tank systems'.	Operational
Water Quality	Barrels and bunded containers will be stored upright and internally where appropriate and always on drip trays or sump pallets.	Operational
Water Quality	Appropriate spill kits will be available at all storage locations.	Operational
Water Quality	All fuel/chemical storage facilities will be subject to weekly inspection.	Operational
Water Quality	Leaking or empty drums will be removed from the Site immediately and disposed of via a registered waste disposal contractor.	Operational
Water Quality	Stormwater, arising from car parking areas and the transformer within the completed development, will be discharged to ground via an oil interceptor and soakaways. Stormwater discharge will be limited to greenfield runoff rates, following attenuation through comprehensive sediment control infrastructure ensuring that no deleterious material is discharged, and no adverse water quality effects are experienced. The	Operational

Topic	Mitigation Measure	Timing of Implementation
	mimicking of greenfield runoff rates is a key part of the surface water management system and will ensure that the hydrological regime is not altered by the proposed development particularly in the context of the split-level design.