Technical Appendix 14.1

Schedule of Commitments

SCOTTISHPOWER RENEWABLES

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14 Schedule of Commitments

14.1 Introduction

1. The Schedule of Commitments provides a summary of good practice, mitigation measures and commitments that have been proposed throughout the Environmental Impact Assessment (EIA) Report to prevent, reduce or offset the effects of the Proposed Development on the environment.

2. The mitigation measures and commitments in **Table 14.1** are those which would be applied prior to construction, during construction and during operation of the Proposed Development. A number of these measures are embedded mitigation, undertaken through good practice and to adhere to relevant legislation during all stages of the Proposed Development.

14.2 Schedule of Commitments

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Chapter 4: Development Description	Micrositing	Pre-Construction	During the construction process there may be a requirement to microsite elements of the Proposed Development infrastructure (e.g. due to unsuitable ground conditions or environmental constraints). A 50m micrositing tolerance of turbines and all other infrastructure is proposed for the Proposed Development. Within this micrositing distance any changes from the consented locations would be subject to approval of the Environmental Clerk of Works (ECoW) as required and in consideration of other known constraints.
	Construction Environmental Management Plan (CEMP)	Construction	The Principal Contractor (PC) responsible for undertaking the construction works would produce a CEMP in line with guidance on Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2019). An Outline CEMP is provided in **Appendix 4.1**. The CEMP would describe how the PC would ensure suitable management of, but not limited to, the following environmental issues during construction of the Proposed Development: • noise and vibration; • dust and air pollution; • surface and groundwater; • ecology and ornithology (including protection of habitats and species); • agriculture (including protection of livestock and land); • cultural heritage; • waste (construction and domestic); • details of the size, location and volumes to be extracted from borrow pits; • pollution incidence response (for both land and water); and • Site operations (including maintenance of the construction compound, working hours and safety of the public). The CEMP will form an overarching document for all Site management requirements, including: • Traffic Management Plan; • Construction Methodology Statement; • Pollution Prevention Plan (including monitoring, as appropriate); • Site Waste Management Plan; • Peat Management Plan; • Water Management Plan; and • Access Management Plan.
	Environmental Clerk of Works	Construction	An ECoW would be engaged onsite during the construction phase. The services of other specialist environmental advisors, such as an Archaeological Advisor, would be procured to support on specific environmental issues as required. The ECoW would ensure that the construction activities undertaken by PC are carried out in accordance with the mitigation measures contained within the CEMP and any planning conditions relating to environmental matters
	Construction hours	Construction	Working hours will be agreed by the appointed Principal Contractor and the Applicant (ScottishPower Renewables (UK) Ltd) prior to works commencing. However, normal construction hours would be between 07:00 and 19:00 Monday to Friday and 07:00 to 16:00 on weekends, or as agreed with the Dumfries and Galloway Council's Environmental Health Officer.
	Temporary peat storage	Construction	Where possible, progressive restoration techniques would be used to place excavated peat material in its final destination rather than in temporary stockpiles. In some circumstances this may not be possible and there may be a requirement to temporarily store excavated peat onsite. It is important both for the peat itself and for the surrounding environment that the peat is not allowed to substantially erode or become dry, while it is stored. Procedures to control the hydrology of stored peat would be covered by the CEMP and are outlined in the Soil and Peat Management Plan (**Appendix 6.2**).
	Drainage	Construction	Measures will be taken to help prevent surface water entering excavations during construction of the turbine foundations. Should surface water run-off or groundwater enter the excavation appropriate pumping measures away from watercourses would be implemented to ensure the works are safely carried out and the excavation is sufficiently dry to allow concrete placement. Once the concrete is cast, the excavated material would be used for backfill and compacted to the required design density. Once this backfill is completed, the crane hardstanding areas would be constructed. Surface or sub-surface water flow within the vicinity of the access tracks and hardstanding areas would be routed into drainage channels. The drainage channels would be situated on the upstream side of the infrastructure and run in parallel with them. These channels would pass under the hard areas, via small diameter carrier drains, to the downstream side where the run-off would percolate to the riparian zone.

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			Where ground conditions permit, channels may connect with infiltration trenches on the downhill side of the hard areas, with a small sump at the inlet to collect silt and treat run-off prior to infiltration to the surrounding soils. Silt traps would also be located along trenches to further facilitate the collection of silts. These would be cleaned out periodically, as required. The edges of the access tracks would be flush to allow the surface water from the road to route directly into the collection channels or infiltration trenches. On steeper sections of track, regular cross drains, connected to infiltration trenches, would be installed to collect surface run-off and ensure longitudinal flow is intercepted, thus avoiding rutting and subsequent breakup of the track surface. Trenches would maintain linear flows to downstream areas avoiding point discharge of large flows. Where the access tracks follow contours, earthworks may be required. Where earthworks are required a collection ditch would be installed at the head of the cutting, with appropriate dams and sumps, to collect silt and prevent sediment transfer to watercourses. A detailed drainage design would be undertaken and submitted to the Scottish Ministers, in consultation with the Scottish Environment Protection Agency (SEPA), for approval prior to construction.
	Forestry (felling/compensatory planting)	Construction	The Proposed Development would use a 'keyhole' approach to the siting of turbines within the forest, to retain as much forestry as possible. The requirements and undertaking of felling would be in close consultation with Forestry and Land Scotland, Scottish Forestry and documented in the Forestry Report which is contained in **Appendix 13.1**. As a result of the construction of the Proposed Development, there would be a net loss of woodland area. In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, offsite compensation planting would be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting would be agreed with Scottish Forestry, and would take into consideration any revision to the felling and restocking plans prior to the commencement of operation of the Proposed Development (see Forestry section below)
	Lighting	Operation	Aviation lighting would be installed as soon as practicable on erected turbines with the hub to be lit by 2000 candela steady red lights, with a single set of intermediate steady red lights halfway down the tower at a reduced intensity of 32 candela. This is in line with the Civil Aviation Authority's (CAA) Policy Statement on Lighting of Onshore Wind Turbine Generators in the United Kingdom with a Maximum Blade Tip Height at or In Excess of 150m Above Ground Level (AGL) (CAA, June 2017)[1]. It is proposed that visibility sensors are installed on the Proposed Development turbines in line with the 2017 CAA Policy Statement so that where visibility is restricted to 5km or less from all the turbines in the Proposed Development, the lights would operate at 2000 candela and where visibility is greater than 5km from all the turbines, the nacelle obstruction lights would be dimmed to 200 candela. The Applicant commits to the implementation of aviation lighting mitigation as discussed in **Appendix 13.3 Indicative Aviation Lighting Landscape and Visual Impact Mitigation Plan,** and subject to agreement with key stakeholders.
	Site Restoration	Construction	As soon as practical once installation is complete, the immediate construction area would be restored to a profile to be agreed with Dumfries and Galloway Council. Crane hardstandings would be retained for future maintenance. The soil would be replaced where appropriate and as advised by an onsite Environmental Clerk of Works (ECoW). Any surplus soil would be used to restore track edges after construction. This progressive reinstatement has been found to assist with re-establishment of the local habitats, as it minimises the time soil is stored. The upper vegetated turfs would be used to dress infrastructure edges and to reinstate the surface of restoration areas. It is anticipated that most of the soil resources within areas directly affected by construction activities would be able to be stored and reinstated as close as possible to where they were excavated in accordance with good practice; so that the Site would be restored with minimal movement of material from its original location. It is not anticipated that any excavated material would leave the Site. Further detail on restoration would be provided within the Construction Environmental Management Plan (CEMP), an outline of which is provided in Appendix 4.1 Outline CEMP.

[1] CAA (2017). Policy Statement on Lighting of Onshore Wind Turbine Generators in the United Kingdom with a Maximum Blade Tip Height at or In Excess of 150m Above Ground Level.

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Chapter 5: Landscape and Visual	Landscape character	Pre-Construction	The Proposed Development would lie within the Foothills with Forest Landscape Character Type (LCT) which has a large scale, simple landform and uniform character, characteristics which are suited to accommodate larger scale turbines. The edge of this area with the upland fringe and Middle Dale LCTs is more sensitive and the design of the Proposed Development takes this into account by ensuring turbines are not positioned on the exterior of the foothills, and are located as far as possible within the interior of the less sensitive foothills.
Chapter 6: Hydrology, Hydrogeology, Geology and Soils	Access tracks	Pre-Construction / Construction	During the detailed design and construction phases, sections of track would be surveyed and microsited, within 50m, to optimise the distances from the waterbodies, taking into account local topography and local characteristics.
	Natural groundwater systems	Construction	A sustainable drainage strategy that minimises disturbance of natural groundwater systems to reduce adverse effect on groundwater levels and flows would be implemented.
	Sub-surface flows and groundwater levels	Pre-Construction	A number of additional, smaller watercourse crossings have been identified during fieldwork, which comprise crossings of flush zones and small headwater channels. These crossings would have structures installed appropriate to local conditions and would be anticipated to be designed as over-sized circular culverts or layers of pipes for flush zones. The following mitigation measures are proposed to reduce potential alterations to sub-surface flows and groundwater levels by the works and, as result, reduce potential effects on Groundwater Dependent Terrestrial Ecosystems (GWDTE): • Development and implementation of a drainage system, encouraging the infiltration of surface water runoff via SuDS arising from the infrastructure. • The tracks will be micro-sited, where possible, to avoid areas of potential GWDTE. • Use of permeable fill in the construction of the access tracks to maintain flow and inclusion of cross-formation drains to maintain groundwater flows, where practicable. • Consideration shall be given to peat storage and reuse in areas of GWDTE, to avoid causing long-term alterations in local hydrological conditions.
	Pollution incidents	Construction	The adoption of the applicable good practice measures as summarised in the Outline CEMP (provided in **Appendix 4.1**) would reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good site environmental management procedures, including minimised storage volumes, staff training, contingency equipment and emergency plans. Key measures identified to reduce potential for pollution include: • application of a 50m buffer zone from OS 1:10,000 watercourses, except where access is required; • secure oil and chemical storage in over-ground bunded areas, limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas; • emergency spill kits retained onsite at sensitive locations; • special measures at concrete batching plants with pre-cast structures used where appropriate; • cessation of work and development of measures to contain and/or remove pollutant should an incident be identified; and • a surface water quality monitoring programme is recommended, to commence 12 months prior to construction and continue into early operational period. During construction, this would include an adaptive monitoring system enabling early investigation of parameters outwith expected ranges, with prompt alerts to the construction team to amend any work activities causing an adverse effect.
	Erosion and sedimentation	Construction	The adoption of the applicable good practice measures as summarised in the **Appendix 4.1 Outline CEMP** and **Appendix 6.5 Borrow Pit Assessment** would reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good site environmental management procedures, including additional precautions when operating machinery close to watercourses, soil management, staff training, contingency equipment and emergency plans. Key measures identified to reduce erosion and sedimentation include: • existing tracks would be used where applicable to reduce earthworks; • vegetation clearance would be scheduled only as needed, buffer strips would be retained as vegetated features and revegetation encouraged with native species; • silt traps would be employed and maintained in appropriate locations; • temporary interception bunds and drainage ditches would be constructed upslope of excavations such as borrow pits to minimise surface runoff ingress and in advance of excavation activities; • borrow pits would have appropriate and specific drainage, likely to include a series of settlement lagoons to reduce sediment load and would be monitored prior to discharge; • excavation and earthworks would be suspended during and immediately following periods of heavy rainfall in order to minimise sediment generation and soil damage; and

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			• a surface water quality monitoring programme is recommended, to commence 12 months prior to construction and continue into early operational period. During construction, this would include an adaptive monitoring system enabling early investigation of parameters outwith expected ranges, with prompt alerts to the construction team to amend any work activities causing an adverse effect.
	Surface water drainage	Construction	The adoption of the applicable good practice measures summarised in the **Appendix 4.1 Outline CEMP** would reduce the impact of modification to surface water drainage patterns, with artificial drainage installed only where necessary and would, wherever practical, be installed in advance of ground being cleared of vegetation. All structures would be designed and constructed following good practice techniques and would be of sufficient capacity to receive storm flows with an allowance for increased flows due to climate change. Key measures identified to minimise alterations to surface water drainage patterns include: • minimising the number of watercourse crossings, using and upgrading existing structures where applicable; • application of sustainable drainage techniques to increase peak lag time and implementation of cross-drains at appropriate intervals and frequent discharge points to reduce scour potential; • minimising the size and duration of in-channel works; and • appropriate design of crossing structures to ensure sufficient capacity to convey 1:200-year storm flows and enable mammal and fish passage.
	Modification of groundwater levels and flows	Construction	The adoption of the applicable good practice measures as summarised in the **Appendix 4.1 Outline CEMP** would reduce potential for lowering effects upon groundwater systems, with the effects of dewatering likely to be local and temporary, with groundwater expected to return to former levels quickly following cessation of construction activities. The key concerns for good groundwater management involve careful decisions involving locations of drainage and dewatering activity and ensuring such activities are undertaken sympathetically and minimised in terms of extent and time to avoid excessive influence on groundwater levels and flows. Key measures identified to minimise alterations to groundwater levels and flows include: • drainage systems, typically consisting of french drains (using a gravel layer as water conduit, rather than pipework, running downhill to a soakaway zone designed to enable water to percolate back into soil), would be installed at hardstanding locations where applicable; • dewatering activity would be limited to the minimum necessary duration; and • tracks crossing GWDTE would have appropriate drainage measures applied to maintain current groundwater conditions.
		Operation	The adoption of the applicable good practice measures would incorporate a sustainable drainage strategy that minimises disturbance of natural groundwater systems to reduce adverse effect on groundwater levels and flows. Good practice sustainable drainage measures would minimise any effect upon GWDTE.
	Loss and compaction of soils and peat	Construction	The design principles and adoption of the applicable good practice measures summarised in the **Appendix 4.1 Outline CEMP** would reduce the soil losses and compaction of soil effects, with the combination of planning infrastructure on very shallow soils, minimising excavation, promoting local reuse of suitable material, identifying catotelmic/amorphous peat in-situ and the majority of vehicle movements being restricted to existing or new site tracks or clearly demarcated construction areas. This combination of measures resulting in any notable effect being very localised and temporary in nature. Site monitoring would identify any areas where soil effects are noted and enable a fast response to minimise effect. Key measures identified to minimise loss and compaction of soils and peat include: • limiting movements to specific corridors avoiding sensitive receptors such as deep peat; • reducing excavation depth for site infrastructure by careful placement; and • limiting storage and restoration of soil and peat to a maximum height of 2m.
	Peat stability	Construction	The inherent design principles and adoption of the applicable good practice measures summarised in the **Appendix 4.1 Outline CEMP** would reduce the effect of peat instability. Key measures identified to minimise peat stability risk include: • avoidance of removal of slope support; • avoidance of heavy loading on slopes; • forestry clearance activities to follow good practice and take account of slope stability; • good drainage practice to ensure flows not concentrated onto slopes or into excavations; • restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and • creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases.
	Peat stability	Construction	Two locations were identified as at initial Moderate risk **in Appendix 6.1 Peat Stability Assessment**, which required further investigation, known as 'Detailed Assessment'. Following a visit and interpretation of the additional site data, location-specific peat stability measures were identified, including:

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			• additional site investigation pre-construction, including post-felling surveys, with any additional areas of concern identified and assessed (and specific mitigation implemented, as applicable); • slope management measures for particular slopes; and • specific drainage designs including routes, scour prevention and discharge locations to be implemented to reduce potential adverse effect on slope stability during construction.
Chapter 7: Ecology and Biodiversity	Construction Environmental Management Plan	Pre-Construction / Construction	A CEMP would be produced and implemented by the Principal Contractor building upon the outline principles set out in **Appendix 4.1 Outline Construction Environmental Management Plan**. The CEMP and associated documents would be subject to written approval from NatureScot, Dumfries and Galloway Council and SEPA
	Environmental Clerk of Works (ECoW)	Pre-Construction / Construction	A suitably qualified experienced Environmental Clerk of Works would be appointed by the Principal Contractor prior to and for the duration of the construction period. The Applicant's ECoW will observe that the Contractors ECoW/s are suitably qualified to undertake their role and would audit the contractual obligations with regards to the environmental safeguarding and mitigation requirements. Tool Box Talks would be delivered to all construction staff by the Principal Contractor's ECoW. The ECoW would be qualified and experienced with regard to environmental and ecological construction issues and ideally be an AECOW[2] member (or equivalent).
	General construction measures	Construction	Construction compounds and on-site working areas would be sited away from ancient woodlands, fen, bog and mire habitat, running and standing water; to minimise the risk of polluted run-off/ waste water or chemicals entering these habitats and dust deposition. Appropriate signage will be used to clearly identify these areas to avoid accidental encroachment. Construction methods will follow relevant best environmental practice to eliminate or reduce the potential for adverse effects on the water environment through a Pollution Prevention Plan (PPP). Construction will comply with the best practice construction methodologies outlined by SEPA in 'Engineering in the Water Environment Good Practice Guide: temporary construction methods' (SEPA, 2009)[3] and in CIRIA, 2015. The PPP will include water protection measures specified in **Chapter 6: Hydrology, Hydrogeology, Geology and Soils.** These include implementation of pollution prevention measures, dust control, and buffer zones around sensitive features; use of check dams, silt fencing etc.
	Working Hours	Construction	These will be agreed by the appointed Principal Contractor, the Applicant and Dumfries and Galloway Council prior to works commencing. However, standard construction working hours are assumed to be Monday to Friday 07:00 to 19:00 and weekends 07:00 to 16:00; or as agreed with the Dumfries and Galloway Council's Environmental Health Officer, reducing the level of disturbance to nocturnal and crepuscular species, such as badgers, bats and otters.
	Air Quality Management and Dust Deposition	Construction	Measures for the control of air quality and emissions (including dust management measures) will be included within the CEMP and will include protection measures specified in **Appendix: 4.1 Outline Construction Environmental Management Plan**.
	Noise and vibration	Construction	Measures for the control of noise and vibration will be included within the CEMP to manage noise and vibration impacts on sensitive ecological features. This will include selection of appropriate quiet plant to reduce noise emissions; noisy plant will be kept as far away as possible from any sensitive features recorded during pre-construction surveys (i.e.bat roosts, badger setts, bird nesting areas, brown trout spawning habitat, as directed by the ECoW).
	Site Species Protection Plan (SPP)	Pre-Construction / Construction	A Site SPP will cover the following species/species groups as a minimum: fish, herpetofauna (amphibians and reptiles), bats, birds, badger, otter, pine marten, red squirrel. Pre-construction surveys will be conducted according to standard guidance. Pre-construction surveys include densely forested areas (e.g. thicket stage) that were inaccessible in the surveys reported herein, due to close nature of planting; if these are inaccessible for pre-construction survey, an ECoW with will directly supervise all felling within these inaccessible areas. The results will be interpreted and used to provide the specifics within the SPP. Requirements for buffer zones will be identified within the SPP (complying with legal and guidance requirements) and will be enforced by on Site by the ECoW and informed to the workforce via Tool Box Talks and appropriate fencing and signage. Where it is identified that construction works will result in the loss of badger setts, red squirrel dreys, pine marten dens, otter holts, water vole burrows etc; these will be excluded according to the terms of any derogation licenses. The SPP will also specify measures to be put in place to ensure works will minimise the risk of disturbance, killing, or injuring of species, such as: avoiding working at night where possible to minimise disturbance to nocturnal / crepuscular species; pre-checking of stored materials prior to use; covering and capping excavations or pipes when not in use; providing a means of escape from excavations; direction of site lighting away from sensitive features for protected species; site speed limit of no greater that 15mph.
	Additional bat mitigation for SPP	Pre-Construction / Construction	Pre-construction bat surveys will be conducted by licensed bat specialists for any trees to be affected by the development and results will be interpreted and used to update the specifics within the Site SPP. Licensing requirements will be included within the Site SPP. If evidence of a bat roost(s), or a roosting bat(s) is identified, a NatureScot derogation licence will be secured in advance of felling the tree(s). Conditions of any such licence may include the provision of compensatory roost features prior to felling the tree. Opportunities for re-use of PRFs after tree-felling will be explored and implemented where possible by attaching to neighbouring trees. Where trees identified as suitable for roosting bats are to be retained,

[2] AECoW is the qualifying body for Environmental Clerks of Works (ECoW). AECoW has been developed to raise professional standards amongst those providing ECoW services.
[3] Scottish Environment Protection Agency (2009) Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods.

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			suitable buffer zones will be established around such features during construction where works are not to take place to avoid disturbance to any bats roosts. These will be a minimum of 30m, increasing to 100m for pile driving works.
	Fish / aquatic ecology SPP	Pre-Construction / Construction	This would include for timing of instream construction works within watercourses confirmed to support fish (or potentially support fish), i.e. Deer Burn, Blenoch Burn, Glenkiln Burn, Rough Cleugh, Clachanbirnie Burn, Yellowtree Grain, Castletrough Burn, Killyminshaw Burn and Garrel Water, to be planned to avoid the sensitive lifecycle stages of the fish present, i.e. to avoid November to April inclusive (brown trout spawning takes place between November and January with eggs likely to remaining in April). The Aquatic Ecology SPP will address sensitivity (including to noise and vibration) of those fish species present (brown trout) and ensure that appropriate construction methods will be implemented to minimise and avoid disturbance or avoidance behaviour during critical life stages. Should any part of a watercourse containing fish need to be impounded during the works, a fish translocation would be carried out to remove fish from the impoundment. Fish translocation operations require authorisation from Marine Scotland, Annan District Salmon Fisheries Board (ADSFB) and the relevant landowner, therefore, such operations would be planned well in advance. In order to help maintain baseline fish populations a Fish Monitoring Programme will be implemented that compares changes in densities pre-construction, during construction and post-wind farm construction with the baseline.
	Herpetofauna SPP	Pre-Construction / Construction	The herpetofauna section of the SPP will set out measures to reduce potential for injury or killing, where appropriate. For example, the ECoW will check existing piles of spoil (brash, logs or rocks) for resting/hibernating reptiles prior to clearance and any excavations which are left open overnight will be inspected for reptiles prior to in-filling, if dug during the reptiles' active period (generally accepted as being late March until the end of October). Any reptiles found will be removed and placed in suitable reptile habitat away from the Proposed Development.
	Habitat Management Plan	Construction / Operation	An Outline Habitat Management Plan (OHMP) has been included as **Appendix 7.6**. A detailed HMP will be prepared, building upon the outline principles set out in the OHMP, detailing areas of habitat creation/restoration, management, and monitoring required as part of the Proposed Development, in consultation with NatureScot and other key consultees.
	Curtailment Strategy for bats	Operation	Curtailment of the operation of all wind turbines during certain weather conditions. The curtailment would apply between 30 minutes post-sunset and 40 minutes pre-sunrise between 1 April until 31 October each year for the lifetime of the Proposed Development. The curtailment strategy would be complemented by a monitoring programme to determine whether the curtailment was effective or whether the timings could be modified at all. These measures are further detailed in **Appendix 7.6 Bat Mitigation Plan**.
	Access tracks	Construction	The main site access would utilise the existing access from the A701 to the operational Harestanes Windfarm, thus minimising the amount of new track required.
	Watercourse crossings	Pre-Construction	All crossings of watercourses which have been confirmed to support fish (or potentially support fish) would be designed to ensure the free movement of fish past them (WC in brackets relates to reference numbers within Chapter 6: Hydrology, Hydrogeology, Geology and Soils), i.e. Kilyminshaw Burn, Deer Burn (WC10), Rough Cleugh (WC05), Clachanbirnie Burn (WC06) and Yellowtree Grain (WC07), in accordance with 'River Crossings & Migratory Fish: Design Guidance' (Scottish Executive, 2012)[4]. Where provision is required for fish, the priority is that natural channel substrate is retained, which may be accomplished using depressed invert culverts.
	Boundary features	Construction	Built structures and boundary features would be retained where possible.
	Operational lighting	Operation	Operational lighting would be limited to aircraft warning thus minimising light-related impacts on nocturnal or crepuscular species such as, bats, badgers and otters.
	Ancient Woodland Loss	Pre-Construction / Construction	Prior to felling any trees in this area, an arboricultural survey will be carried out to ensure tree felling is minimised and appropriate tree root protection areas are protected. In order to compensate specifically for the loss of this ancient woodland, new areas of tree planting will be incorporated into the Compensatory Planting proposals as set out in **Chapter 4: Development Description.** In addition, this area of ancient woodland will be subject to positive management measures to improve or maintain its current value. The specifics of such management measures will be agreed post-consent.
	Enhancement	Construction	Alongside measures described within the OHMP, there is the opportunity to secure a number of biodiversity enhancements across the Site. Measures such as installation of bat boxes, pine marten boxes, native woodland planting and provision of pollinator habitat would all serve to improve biodiversity. Relevant stakeholders such as Buglife should be consulted where possible so that any enhancement measures can align with wider projects (e.g. such as Buglife's B-Lines project). Likewise, all enhancement initiatives should seek to align with conservation measures currently being undertaken by FLS at the Site.

[4] Scottish Executive (2012) River Crossings & Migratory Fish: Design Guidance.

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Chapter 8: Ornithology	Raptor / Goshawk	Pre-Construction	Prior to the commencement of felling and construction works, pre-construction raptor/goshawk surveys of the Application Boundary and a surrounding buffer of at least 1km would be carried out. The surveys would broadly follow the methods detailed in Hardey et al. (2013)[5] and would involve a combination of vantage point surveys followed by more intensive forest checks to identify active nest site locations. The vantage point surveys would include the late winter/early spring months when goshawks engage in display flight activity and observations at this time may help to target certain areas during the forest searches. A detailed survey protocol would be prepared and agreed with NatureScot prior to the commencement of surveys to ensure appropriate intensity and coverage by the survey. The survey programme should be undertaken in the breeding season immediately preceding the commencement of construction works. For example, if construction works were programmed to commence in the autumn, surveys should be undertaken in the preceding breeding season of that year. The purpose of these surveys would be to confirm the continued presence of goshawks (and identify the presence of any other specially protected raptor species) in the vicinity of the Proposed Development, and establish whether any breeding pairs are present and where the current nest sites are located (i.e. in relation to the Proposed Development). The surveys would be supplemented by consultation with Dumfries and Galloway Raptor Study Group and FLS who may hold information on goshawk (or other raptor) nesting activity which may have taken place in the intervening years between the submission of this EIA Report and the commencement of construction works. These surveys would identify whether there are any other nest sites in the vicinity of the windfarm site which could pose a constraint to the construction works and help to inform the scheduling of works.
	Raptor / Goshawk	Construction	The pre-construction goshawk surveys would be repeated during the construction phase in order to identify the requirement for any associated works exclusion zones and assist the contractor to schedule the works more appropriately to avoid disturbance impacts on nesting goshawks. Site clearance and construction activities should be timed to take place outside the main bird breeding season to avoid nest destruction and disturbance to all nesting birds. With regards to goshawk specifically, young recently fledged birds may still be present around the nest into August and the presence and potential disturbance of these dependent young must be taken into consideration given the species Schedule 1 protection status. SNH (2016)[6] recognises that avoiding construction work within the breeding season for birds may not be possible, as the season coincides with the best weather for construction and recommends precautionary measures would to be taken in relation to breeding birds. For instance, if works would coincide with the breeding season it is considered advantageous to start before mid-March. This would allow birds the opportunity to take potential disturbance into account in the process of selecting a nest site. Goshawks often have widely spaced, alternative nest sites within their home range (Forrester et al, 2007)[7] and the data discussed here indicates that is the case for pairs relevant to the Proposed Development footprint. Those birds with a choice of nest sites may select an alternative area where disturbance is less intrusive in which to nest for that season. During the breeding season, pre-works nest checks of felling areas would be undertaken for goshawk, as for all birds, using the approach outlined in **Chapter 8: Ornithology**. The nest checks and any subsequent buffer zones would take account of disturbance distances discussed for goshawk in **Chapter 8: Ornithology** if goshawk nests are located.
Chapter 9: Noise	Construction Noise and Vibration	Construction	Adoption of Best Practicable Means (BPM) as defined in the Control of Pollution Act 1974 is usually the most effective means of controlling noise and vibration from construction sites. BPM would be employed including the following measures: • Staff would receive appropriate environmental training at the beginning of the contract and throughout the construction. • Silenced or sound reduced compressors, would be used where necessary. • Silencers or mufflers would be fitted to pneumatic tools where required. • Deliveries would be programmed to arrive during daytime hours only, with care being taken to minimise noise when unloading vehicles. • Delivery vehicles would be prohibited from waiting within the site construction compound with their engines running.

[5] Hardey, J., Crick, H.Q.P., Wernham, C., Riley, H., Etheridge, B., Thompson, D. (2013). Scottish Natural Heritage Raptors a field guide for surveys and monitoring (3rd Edition). The Stationery Office Edinburgh.

[6] SNH (2016). Dealing with construction and birds; Guidance Note. Available online at: https://www.nature.scot/sites/default/files/2017-09/Guidance%20note%20-%20Dealing%20with%20construction%20and%20birds.pdf.
[7] Forrester, R. W., Andrews, I. J., McInerny. C. J., Murray, R. D., McGowan, R. Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. and Grundy, D.S. (eds) (2007). The Birds of Scotland. The Scottish Ornithologists' Club, Aberlady.

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			• Plant items would be properly maintained and operated according to manufacturers' recommendations, in such a manner as to avoid causing excessive noise. • Access to the site would be along agreed access routes only. • There would be compliance with agreed working hours, e.g. construction activities audible beyond the site boundary would only be undertaken during the daytime between 07:00 to 19:00 hours Monday to Friday and 07:00 to 16:00 hours on weekends, or as agreed with the Dumfries and Galloway Council's Environmental Health Officer. • Effective liaison with the local community would be established and maintained throughout the construction period. This would include provision of information on the on-going activities (including blasting where required) and provision of contact telephone numbers for the site to obtain information during operational hours, a representative being identified with appropriate authority to resolve any problems and a log of complaints and actions taken to remedy these being maintained. • The good practice advice detailed in both BS5228-1 and BS5228-2 would be complied with. Compliance with the above measures would be ensured through inclusion within a Construction Environmental Management Plan (CEMP) which the appointed contractor would be required to comply with (**Appendix 4.1** presents an Outline CEMP). The final CEMP would be subject to agreement with Dumfries and Galloway Council and the Scottish Environment Protection Agency (SEPA) and a planning condition could be used to ensure that it was followed in practice.
	Blast-induced vibration and air overpressure	Construction	The following good practice measures would be included within a blasting management programme, compliance with which can be ensured through the CEMP as to be agreed with Dumfries and Galloway Council and the Scottish Environment Protection Agency (SEPA): • care would be taken with the development of faces, and with trial blasts, as anomalous vibration levels might be produced when there is no free face to relieve the energy produced; • appropriate burden would be ensured to avoid over- or under-confinement of the charge; • accurate drilling and setting out would be undertaken; • charge levels would be appropriate; • exposed detonating cords would not be used; • stemming with appropriate material such as sized gravel or stone chippings would be undertaken; • decking charges/in hole delays/delay detonation would be used to ensure smaller maximum instantaneous charges (MICs); • a series of groundborne vibration measurements and air overpressure measurements would be undertaken to check compliance with appropriate criteria (adopted from BS5228-2). • each charge would be individually designed to maximise efficiency and reduce energy loss through vibration and air overpressure; • the use of surface detonating cords and secondary blasting will be avoided wherever possible; • the areas of heave and the total charges will be minimised; and • blasting in adverse weather conditions will be avoided (i.e. wind in the direction of sensitive receptors). • Local residents will be informed in advance of the proposed times of blasting works, along with details of the good practice mitigation measures that are in place, to ensure good relations and appropriate reassurance.
	Blast-induced vibration and air overpressure	Construction	The assessment has identified that, with the embedded mitigation measures in place, a significant effect would not arise. An appropriate planning condition can be used to ensure that the content of the CEMP, including the listed mitigation measures, are agreed with Dumfries and Galloway Council as well as SEPA, and that the appointed contractor is required to comply with the CEMP.
	Operational turbine noise	Operation	As the assessment has been undertaken on the basis of a candidate turbine type. It would be appropriate to control noise from the proposed development by use of a noise related planning condition, stipulating the noise level limits to which the Proposed Development must comply. Appropriate noise level limits for the Proposed Development are Presented in **Appendix 9.10 Proposed Planning Condition Limits**.
Chapter 10: Archaeology and Cultural Heritage	Turbine and Constrol Building appearance	Pre-construction	Further 'embedded mitigation' that helps to reduce the visual impact on heritage assets is the consideration given to the appearance, finish and colour of the wind turbines and the control building in accordance with NatureScot guidance (Scottish Natural Heritage,2017) Siting and Designing Wind Farms in the Landscape, allowing for a reduction in the indirect impacts on the setting of heritage assets within the Study Area.
	Site demarcation and avoidance	Construction	Surviving heritage assets that are within 50m of any proposed turbine base, access track, borrow pit, or crane hardstanding would be demarcated prior to the commencement of construction to ensure visibility of the heritage asset location to all members of the construction crew. Demarcation would be

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			achieved using high visibility marker posts set 5m from the edge of the heritage asset, with the markers retained throughout the construction phase. Demarcation of heritage assets would be the responsibility of the Principal Contractor, with identification of the heritage assets made on the ground by a qualified archaeologist using the baseline information provided in **Appendix 10.5 Archaeology and Cultural Heritage Gazetteer**. The heritage assets to be demarcated include: • Whitefaulds Shepherd's Cairn (HA45) • Donken's Cottage Enclosure (HA49) • Donken's Cottage (HA50) • Clachanbirnie Sheepfold (HA58)
	Archaeological recording (Basic recording (ALGAO, 2013[8]))		Any surviving upstanding structural heritage assets that are likely to be truncated or wholly removed by the Proposed Development would Be recorded prior to construction to allow for the creation of a permanent record of the heritage asset and its preservation by record. The heritage assets to be recorded prior to construction includs: • Clachanbirnie wall (HA53) • Pumro Fell Cairn (HA56)
	Construction guidelines		Written guidelines would be issued for use by all construction contractors outlining the need to avoid causing unnecessary damage to known heritage assets. The guidelines would set out arrangements for calling upon retained professional support in the event that buried archaeological remains (such as building remains, human remains, artefacts etc.) should be discovered in areas not subject to archaeological monitoring. The guidelines would make clear the legal responsibilities placed upon those who disturb artefacts or human remains.
Chapter 11: Access, Traffic and Transport	Physical measures to design out adverse effects	Construction	The assessment has assumed the use of ready mix concrete delivered in separate cement mixer vehicles in order to assess the worst case scenario. This proposal is considered to be robust in reviewing the potential traffic impact associated with the Proposed Development and could be reduced by the provision of an onsite batching plant within the construction site. The number of Heavy Goods Vehicle (HGV) movements would be reduced with an onsite batching plant as bulk deliveries of cement can be made via a 20 tonne powder tanker and aggregate can be delivered via a 35 tonne tipper HGV. The Applicant may consider the use of an onsite batching plant during the construction phase, to help reduce HGV numbers on the proposed access routes. Use of on-site borrow pits would further reduce the number of HGV trips associated with the construction of the Proposed Development. It is expected that a significant proportion of the required materials would in fact be sourced on site, thus further reducing the required number of HGV movements. Advance warning signs and clear visibility splays would be used at the site access to help advise road users of the increased numbers of turning traffic at the site access junction.
	General construction traffic	Construction	General construction traffic would generally avoid the morning and evening peak periods. A Construction Traffic Management Plan (CTMP) would be prepared and agreed with the Dumfries and Galloway Council and Transport Scotland prior to construction works commencing on site. The CTMP would be developed using experience gathered during the construction of recent projects in the Local Authority area and the operational Harestanes Windfarm. The following measures could be included within CTMP during the construction phase: • All materials delivery lorries (dry materials) would be sheeted to reduce dust and stop spillage on public roads; • Specific training, audit and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway; • Appropriate traffic management measures would also be put in place at the Site access junction to advise drivers to slow down and be aware of turning traffic; • Directional signage could be provided to enforce delivery routes;

[8] ALGAO: Scotland (2013) Historic Building Recording Guidance for Curators, Consultants and Contractors. Available online at: https://www.algao.org.uk/sites/default/files/documents/ALGAO_Scotland_Buildings_Guidance_2013.pdf.

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			• Requirement for all drivers to attend an induction to include a safety briefing, the need for appropriate care and speed control, particularly in sensitive areas, identification of specific sensitive areas, identification of the specified route, and the requirement not to deviate from the specified route; and • A Travel Plan to encourage lift sharing /crew bus access to site for construction staff.
	Abnormal indivisible loads (AIL)	Construction	With regards to abnormal indivisible load movements, a number of the necessary works identified are similar to those already in place for previous windfarm developments. These have been improved or altered, to suit the proposed larger turbine loads and would be made permanent with the agreement of the road authorities. In general, it is considered that these can be delivered without significant civil engineering works or disruption to existing road users. Any street furniture that is removed on a temporary basis to enable AIL movements would be fully reinstated following the delivery period. The existing Site access junction off the A701 would be widened on its north eastern side to accommodate the proposed abnormal loads. Form this point onwards, loads would proceed to the turbine locations using existing upgraded and new access tracks. An agreed access strategy for turbine loads would be confirmed post consent once the turbine supplier and the turbine details have been confirmed. This would include a further route assessment and trial run of the confirmed component dimensions and vehicle set up, following confirmation of the appointed haulage contractor. All abnormal load convoys would include a minimum of two escort vehicles in addition to a police escort to facilitate the delivery of the predicted loads. The police escort would be supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact. Abnormal loads would be escorted in accordance with 'Code of Practice: Lighting and Marking for Abnormal Load Self Escorting Vehicles Incorporating Operating Guidance'. The escorting would be undertaken by the appointed haulage contractor with the assistance of Police Scotland. The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow overtaking opportunities for following traffic where it is safe to do so. There are parts of the route where the escort vehicles would be required to advise traffic to temporarily stop (with the assistance of Police Scotland), to allow for the safe passage of loads. This would be required at locations where the carriageway narrows and at locations where there are significant changes in the horizontal alignment of the carriageway. The prodcedure for this is set out in **Chapter 11: Access, Traffic and Transport**. The times in which the convoys would travel would be agreed with Police Scotland who have sole discretion on when loads can be moved. It is likely that the convoys associated with the movement of AILs would travel in the early morning periods, before peak times.
	Convoy management	Construction	To address any concerns expressed by the local community, it is proposed that a detailed convoy management plan is developed with Dumfries and Galloway Council and Transport Scotland. This would include measures to provide hold points for convoys to ensure that inconvenience to other road users can be minimised. Hold point locations along the delivery route may include the following locations where traffic can overtake loads under police control. These would use existing road space, rather than new construction including an overtaking / passing area to pass convoys on the dual carriageway section of the A75 at Gretna and an overtaking / passing area to pass convoys on the dual carriageway section of the A75 at Collin. The potential for using these areas would be developed in detail with Police Scotland and the roads authorities and a detailed convoy management plan would be established prior to the movement of any loads.
	Local road users	Construction	Advance warning signs could be installed on the approaches to the affected road network, subject to the agreement of the road authorities. The signage would assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (if applicable). The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management proposals for the project. Information on the turbine convoys would be provided to local media outlets to help assist the public. These could include: • Local Newspapers; • Community Councils; and • Dumfries and Galloway Council website. Information would relate to expected vehicle movements from the Port of Entry through to the site access junction. This would assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

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			Potential conflicts between AIL turbine loads and other road users can occur at a variety of locations and circumstances. These conflicts would be managed by the appointed haulage contractors escort vehicles, with assistance from Police escorts as and when required. The main potential conflicts are likely to occur at the following locations: • In rural areas where the loads may straddle the centre line of the road, where fast moving oncoming traffic may be encountered etc.; • Where traffic turns at a road junction, requiring other traffic to be held back on other approach arms; and • Locations where high speeds of general traffic are predicted.
	Construction deliveries	Construction	All deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network.
	Traffic Management Plan	Construction	A Traffic Management Plan would be produced as part of the CEMP and include: • Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing; • A review of clear heights with utility providers along the route; • Ensure that any vegetation along the route is cut back to provide a clear running channel; Confirm that there are no roadworks or closures that could affect the loads; • Communication protocols and lay over areas to allow overtaking; • Discussion with Transport Scotland on the potential for using the existing Variable Message Signage (VMS) network to provide additional information to users of the A75 and M74; and • A communication dialogue between the various stakeholders. Traffic management measures would also include an inspection of road signage around the site access junction which would be undertaken by the site manager on a regular basis. During the access junction construction works, there would be a daily road inspection and the public road would be kept clear of debris and mud. A road sweeper would be employed as and when required to remove any debris from the public road network in the vicinity of the site access junction.
	Construction routes	Construction	Site direction signage could also be provided to direct construction traffic to the Proposed Development Site and to ensure that traffic remains on approved routes and would not operate on minor road links that have not been assessed. The Balance of Plant (BoP) contract would specify the routes that suppliers must take during construction activities. This would be enforced by the site agent.
Chapter 12: Socio-economics, Tourism and Recreation	Local employment	Construction / Operation	The CEMP would include measures for the PC to work proactively with contractors and suppliers to provide employment opportunities in the local area. It is anticipated that the PC would hold a local 'meet-the-buyer' open day. This would provide an opportunity for local contractors and suppliers to present their business to the PC. The CEMP would also include public liaison (e.g. public notices) that would be issued prior to the commencement of construction works informing local residents and businesses of dates and durations of the works.
	Access	Construction	An Access Management Plan (AMP) would be prepared as part of the CEMP in order to ensure access for users of the Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10 and Locharbriggs-Beattock local cycle route is maintained throughout the construction period. Occasional temporary local diversions might be implemented in order to facilitate construction. Areas immediately surrounding the construction activities may be temporarily restricted diverted during construction for informal recreational activities such as walking, cycling, horse riding and deer stalking. The area and duration of such restrictions would be kept to a minimum as is required for the work to be conducted safely and efficiently. In addition, in keeping with good practice for construction sites, notices would be placed in prominent locations around the Site with details of any areas with restricted access. The diversions and restricted access are not anticipated to be in place throughout the full 12 months of the construction period, but only during specific phases of the construction period.
	Maintenance activities	Operation	When maintenance activities are undertaken during the operation of the Proposed Development, appropriate safety measures including adequate warning signs and exclusion areas would be required to ensure safety for walkers, cyclists, horse riders and deer stalkers. It is anticipated that the Core Path 39 (Ae Forest Large Circular), Roman and Reivers Long Distance Route, Regional Cycle Route 10 and Locharbriggs-Beattock local cycle route may need to be diverted for maintenance works.
	Recreation Enhancements	Construction and Operation	The Applicant is proposing to implement enhancements in addition to the Proposed Development as detailed in **Chapter 4: Development Description**. Proposed enhancements are detailed below: • electric vehicle charging points in the Ae Forest carpark (subject to agreement);

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			• financial support to facilitate the purchase of E bikes for rental at the recreational centre (subject agreement); • promotion of new electric bike routes within Forest of Ae (subject to agreement). The location of the proposed routes is shown on **Figure 12.2: Proposed Bike Facilities**; • promotion of family friendly / beginner biking routes or horse-riding routes around the proposed windfarm using existing and upgraded forest tracks; • provision of a shelter with tools for bike maintenance and a place to shelter / picnic area within the windfarm (subject to agreement). The location of the proposed bike shed and picnic area is shown on **Figure 12.2: Proposed Bike Facilities**; • provision of information boards regarding the Proposed Development; and • support for the employment of seasonal ranger to assist with the management of core footpaths in the area.
Chapter 13: Other Issues	Forestry and Land Use	Pre-Construction / Construction	Approximately 82.23 hectares (ha) of advanced felling would be required for construction of the Proposed development, with some forestry subsequently being replanted. The area of unplanted ground would increase and as a result there would be a net loss of woodland area of approximately 61.23 ha, which would comprise a decrease of conifer woodland by 49.1ha and broadleaf woodland by 12.23ha (including ancient/native woodland). In order to comply with the Scottish Government's Control of Woodland Removal Policy, compensation planting would be required to mitigate for the loss of woodland area. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting to be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of operation.
		Construction	Forestry waste would be managed in line with SEPA guidance document WST-G-027 ‘Management of Forestry Waste’ (SEPA, 2013)[9]. It is proposed that full consideration and further clarification on this issue would be included in a Forestry Waste Management Plan to form part of the CEMP.
		Pre-Construction	Regarding the ancient/native woodland loss near the Site entrance from the A701, a conservative estimate of forestry loss has been made. The Applicant commits to undertaking an arboricultural survey at the detailed design stage to more accurately quantify the forestry loss in this area.
	Aviation and Radar	Operation	Measures are proposed to mitigate Line of Sight effects on Primary Surveillance Radar operated by NERL, Glasgow Prestwick Airport and the Ministry of Defence. Mitigation measures are required to be agreed with these aviation stakeholders.

Table 14.1: Schedule of Commitments

[9] SEPA (2013): SEPA Guidance Notes WST-G-027 “Management of Forestry Waste”. Available online at: https://www.sepa.org.uk/media/28957/forestry_waste_guidance_note.pdf.

Harestanes South Windfarm Extension Project Team

ScottishPower Renewables
9th Floor ScottishPower Headquarters
320 St Vincent Street
Glasgow
G2 5AD

HarestanesSouthWindfarm@scottishpower.com



www.scottishpowerrenewables.com

SCOTTISHPOWER
RENEWABLES