Chapter 15

EIA Summary

SCOTTISHPOWER RENEWABLES

Table of contents

Chapter 15
EIA Summary

15.1 Introduction

1. The EIA Summary provides a summary of the findings of the full Environmental Impact Assessment (EIA) Report. It includes a Schedule of Mitigation and a Summary of the Residual Effects.

2. The Schedule of Mitigation provides a summary of the mitigation measures that have been proposed throughout the EIA Report to prevent, reduce or offset the effects of the proposed Development on the environment.

3. Good practice and mitigation measures have been integral to the design evolution of the proposed Development as described in **Chapter 3: Site Selection and Design**. A series of environmental and technical constraint design reviews were undertaken to minimise the potential for significant environmental effects prior to finalising the design of the proposed Development. Areas which were examined in depth include:

- landscape and visual constraints;
- hydrology, hydrogeology, geology and soil;
- ecology;
- ornithology;
- noise;
- cultural heritage;
- access, traffic and transport; and
- forestry.

4. The Summary of Residual Effects provides a summary of the possible effects of the proposed Development, the proposed mitigation measures, and the residual effects anticipated after mitigation measures have been applied.

15.2 Schedule of Mitigation

5. The mitigation measures and commitments in **Table 15.1** 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.

15.3 Residual Effects

6. Residual effects during construction and operation are summarised in **Tables 15.2** and **15.3** respectively. A summary of the residual cumulative effects of the proposed Development in combination with other local wind energy developments are presented in **Table 15.4**. Text within these tables in **bold** shows where an effect is considered to be significant in terms of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. (the EIA Regulations).

7. The tables provide a quick reference to the residual environmental effects identified in the technical sections of this Environmental Impact Assessment Report (EIAR), as well as a cross reference to the relevant mitigation measures identified. Provided that the proposed mitigation measures are successfully implemented, the residual effects related to most environmental disciplines are not considered to represent significant effects in the context of the EIA Regulations, with the exception of landscape and visual and cultural heritage effects.

8. All onshore windfarm developments are likely to give rise to some significant landscape and visual effects. In the case of the proposed Development, the significant effects on landscape character and visual amenity would be contained within a relatively moderate area around the Site when compared with other windfarm developments of this scale. It is considered that the landscape is capable of accommodating the proposed Development, and that significant effects on the existing landscape character or visual amenity are relatively contained.

9. The layout of the proposed Development has been designed as far as possible to avoid direct effects on the identified heritage assets within the Site and no direct effects on any identified heritage assets are predicted.

10. Direct effects are predicted on two heritage assets that lie in close proximity to the proposed Development infrastructure. As such mitigation is proposed to reduce the effects.

11. No monitoring measures are required in relation to predicted effects on cultural heritage. An indirect, significant effect is predicted on the setting of Cairn Hill cairn. Although significant in EIA terms, it is considered that the predicted effect would not compromise the cultural significance of the cairn.

Table 15.1 Schedule of Mitigation

EIA Report Chapter	Matter / Effect Requiring Mitigation	Timing / Phase	Mitigation
3: Site Selection & Design	Borrow pits	Pre-construction	Geotechnical investigations would be carried out to identify which of the eight borrow pit search areas would yield the required quality of rock for each aspect of the infrastructure.
	Micrositing	Pre-construction	A 50 m micrositing allowance around windfarm infrastructure in order to be able to address any localised environmental sensitivities, unexpected ground conditions or technical issues found during detailed intrusive site investigations and construction. The need for any micrositing would be assessed and agreed with the onsite Environmental Clerk of Works (ECoW).
4: Development Description	Construction Environmental Management Plan	Construction	A Construction Environmental Management Plan (CEMP) would be developed and implemented by the Principal Contractor. This would include the following: Traffic Management Plan; Construction Methodology Statement; Pollution Prevention Plan; Site Waste Management Plan; and Water Management Plan.
	Environmental Clerk of Works	Construction	An Environmental Clerk of Works (ECoW) would be engaged on site during construction. The services of other specialist advisors would be retained as appropriate, e.g. an Archaeological Advisor, to be called on as required to advise on specific issues.
	Construction hours	Construction	Construction hours for the proposed Development would be 7am to 7pm Monday to Friday and 7am to 4pm on weekends. Out of necessity, due to weather conditions and health and safety requirements, some activities may occur outside these specified hours stated.
	Artificial lighting	Construction	Artificial lighting which may be required during the construction phase would be non-intrusive to minimise impact on local properties and any other environmental considerations.
	Waste Management	Construction	Excavated material from turbine bases and access tracks would be used onsite for restoration/reinstatement. A Site Waste Management Plan would be developed for implementation during construction and contained within the CEMP.
	Pollution prevention	Construction	A Pollution Prevention Plan would be included within the CEMP. This would include details on storage of fuel and oil and how foul effluent would be treated in line with SEPA guidance.
	Peat storage	Construction	Where possible, 'restore-as-you-go' techniques would be used to place excavated peat material in its final destination rather than temporary stockpiles. However, if not possible, in the interim period peat would be stored on site. Procedures for controlling the hydrology of the peat would be included within the CEMP and the Peat Management Plan. These would include: • prior to the excavation of relevant infrastructure, vegetation, peat and superficial geology would be removed and stored in overburden stockpiles (or used directly in restoration of other areas; see below); • overburden stockpiles would be located adjacent to the infrastructure at least 50 m from watercourses in order to reduce the potential for sediment to be transferred into the wider hydrological system; • run-off from overburden stockpiles would be directed through the infrastructure Sustainable Drainage System (SuDS) measures including silt fences and mats, drainage measures and settlement lagoons, as appropriate; and • peat would not be allowed to dry out in the overburden stockpiles. The catotelm layer would not be used for the dressing of roads and hardstandings, unless back-bladed to prevent erosion. A minimum thickness of 300 mm would be adopted to prevent erosion. It would only be used for the dressing of slopes and batters on slopes no greater than 45 degrees.
	Site restoration	Construction	Where possible, excavated soil would be stored and reinstated as close as possible to where it was excavated from, in accordance with good practice.
	Forestry felling keyhole	Construction	Forestry felling generally would consist of a 90 m keyhole radius around each turbine location to allow for construction, operation and environmental mitigation.
	Compensatory planting	Construction and Operation	Provision of appropriate compensatory planting. The extent, location and composition of this to be agreed with Forestry and Land Scotland (FLS) prior to the commencement of the operation of the windfarm.
	Turbine lighting	Operation	As the turbines are above 150 m height and would be lit by aviation lighting. The possibility of using an aviation detection lighting system is being considered, alongside other light minimisation measures. Should consent be granted further consultation with the Civil Aviation Authority (CAA) and Glasgow Prestwick Airport (GPA) would be undertaken.
6: Landscape and Visual	Turbine lighting	Operation	It is proposed to explore the possibility of using an aviation detection lighting system, with lights only switched on when low altitude aircraft are in the airspace above the proposed Development. Other light minimisation measures are being considered.
	Landscape character	Development	Siting and design of the proposed Development seeks to consolidate the larger turbines within the Plateau Moorland with Forest Landscape Character Type (LCT) (18), generally avoiding siting turbines within the more sensitive Rugged Uplands and Forests LCT (21). The positioning of the proposed turbines is generally set well back into the upland interior to minimise intrusion on containing skylines formed by the uplands and avoids having prominent turbines seen at full height on the skyline.
	Ayrshire Scenic Area	Development	The large majority of the proposed turbines are sited outside the Ayrshire Scenic Area (ASA) (16 of the 18 turbines) in order to accord with LDP policies on 'Landscape Quality' and 'Protecting the Landscape' and reduce the effects of the proposed Development on the ASA and the setting of communities/skylines within the Stinchar Valley. The final design of the proposed Development avoids siting turbines on the more elevated smooth, rounded hills to the north of the Site within the ASA.

EIA Report Chapter	Matter / Effect Requiring Mitigation	Timing / Phase	Mitigation
	Stinchar Valley / Barr	Development	The proposed Development has been sited to avoid turbines encroaching down into the sensitive Intimate Pastoral Valley LCT of the Stinchar valley, with the proposed turbines generally set well back in the upland plateau. The majority of the Stinchar Valley has no visibility of the proposed Development, with occasional views of a small number of turbines on the northern edge of the Site.
	Merrick Wild Land Area (WLA)	Development	The proposed turbines are sited as far as possible to the west and south of the Site in order to increase the distance of the proposed Development from the Merrick WLA. In views from the Merrick WLA, the proposed turbine layout has been optimised so that the configuration of the turbines has a balanced and consistently spaced appearance, located in the forested plateau moorland and avoiding the higher and more distinctive parts of the ridgeline. The proposed Development has been designed so that it is not visible from the 'core' lower-lying interior area of the Merrick WLA, which is the area of the Merrick WLA with the strongest wildness qualities.
	Residential Visual Amenity	Development	The closest turbines of the proposed Development were set back as far as possible in order to reduce the prominence of turbines in views from the closest residential dwellings.
	Mark Hill Windfarm	Development	The proposed turbines have been sited to allow for some separation from the operational Mark Hill Windfarm and limit coalescence with Mark Hill, ensuring that the windfarms have satisfactory separation distance and separate identities, forming clearly separate windfarms in views.
	Landmark hills	Development	The proposed Development has been designed to reduce and avoid significant effects on views of 'landmark hills' defined in the South Ayrshire Landscape Wind Capacity Study (2019).
7: Hydrology, Hydrogeology, Geology & Soils	Standard good practice	Construction	The following good practice measures would be incorporated: • Detailed pre-construction site investigations; • Targeted monitoring and assessment of groundwater levels and flows beneath the Site; • Pre-construction baseline water quality sampling and analysis of watercourses, with a programme of regular monitoring and analysis implemented throughout the construction period; • Forestry felling works undertaken in accordance with good practice; • Earthmoving works or similar operations carried out in accordance with relevant code of practice; • Detailed Drainage Strategy developed prior to construction and agreed with Dumfries & Galloway Council (D&GC), Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), South Ayrshire Council (SAC) and FLS; • All watercourse crossings, site discharges and temporary water abstractions would be regulated under the CAR licensing regime; and • Site management to check weather forecast daily and ensure pollution control systems are maintained or work suspended during adverse weather conditions.
	CEMP	Construction	A CEMP would be implemented and agreed with D&GC, SEPA, SNH, SAC and FLS prior to commencement of construction. This would contain construction method statements including the following: • Definition of roles and responsibilities; • Detailed breakdown of phasing of construction activities; • Surface Water Management Plan; • Pollution Prevention Plan; • Site Waste Management Plan; • Details of storage of fuels and other chemicals; • Borrow bit management measures; • Details of concrete batching; • Contingency planning and emergency procedures; and • Ongoing monitoring of construction procedures.
	Access tracks on peat	Construction	Over localised areas of deep peat, access tracks would be floated to avoid excavation of peat. This would involve placing of a geotextile membrane on existing topsoil and vegetation followed by aggregate layers.
	Peat	Construction	Where excavation of peat is required for construction of turbines and other infrastructure, excavated peat would be re-used on site (detailed in the Peat Management Plan (PMP)).
	Dewatering	Construction	Minimise requirement for dewatering by timely and efficient excavation of the foundation void and subsequent concrete pouring and backfilling.
	Working platforms	Construction	Where needed, working platforms would be formed to ensure that surface water drains away from the watercourse.
	Soils	Construction	To avoid unnecessary compaction and disturbance to site soils, working areas and corridors would be established and demarcated, with construction operatives appropriately inducted and trained to avoid work outside these areas.
	Habitat Management Plan	Construction & Operation	A Habitat Management Plan (HMP) would be implemented which has the primary objective to improve an area of flat wet modified bog habitat, by means of various restoration measures. This would promote the development of sphagnum and peat and would result in a beneficial hydrological effect on the watercourses local to the designated area, as well as a net benefit to the biodiversity of the bog habitat. The implementation of the HMP includes planting of broadleaf trees along watercourse corridors.
8: Ecology & Biodiversity	Habitats	Construction	The following good practice mitigation would be undertaken: • Careful removal, segregation, storage and re-use of vegetated turves, to ensure successful site restoration of track batters and temporary compound areas, as appropriate. • Protection of watercourses by provision and maintenance of silt fencing at crossing points.

EIA Report Chapter	Matter / Effect Requiring Mitigation	Timing / Phase	Mitigation
			• Provision of check-dams supplemented by silt fencing within trackside drainage ditches for the duration of the construction programme. To be maintained before removal for the operational phase. • Spill kits would be carried by all site vehicles and additional kits to be available at compounds, lay-downs and refuelling areas. • Appropriate drainage measures around all compounds and lay-down areas. • Use of environmentally friendly (i.e. biodegradable) lubricants and hydraulic fluid products for plant. • Light pollution from artificial lighting (potentially required during the construction phase to ensure safe working conditions, during periods of limited natural light) would be non-intrusive, e.g. directed down and towards works activity and away from edge habitats and watercourses, to minimise impact on species using these habitats.
	Species	Construction	The following good practice mitigation would be undertaken: • Limiting lighting to allow for some dark periods to reduce impact upon foraging bats. • Speed limit of 15 mph at all times • Holes would be covered at the end of each working day or means to allow trapped species to escape. Any temporarily exposed open pipe system would be capped to prevent wildlife access. • Works conducted during daylight hours where possible, avoiding sensitive dawn and dusk periods • Mulch/woody waste arising from tree felling would be placed in piles located at least 50m from windfarm construction works. • Where appropriate and safe to do so, construction working areas with potentially suitable open habitats for reptiles would initially be cut during the active season for reptiles (April-October) under the guidance of the ECoW and with consideration for nesting birds. The ECoW would move any potential refugia or hibernacula from working areas by hand and working areas kept unsuitable for reptiles through regular cutting until construction in that location commenced. • Any proposed instream works would require a fish rescue prior to works commencing • In the event that a protected species is discovered onsite all work in that area would stop immediately and the ECoW contacted.
	Habitat Management Plan	Construction & Operation	The HMP includes a protocol to monitoring the effectiveness of the restoration works on the wet modified bog habitat and generation of riparian woodland.
	Bats	Operation	Key-hole buffers around turbines would be set at 90m, exceeding the minimum requirements for bat safety. Any lighting required would be directed away from any of the identified commuting and foraging routes to avoid unnecessary disturbance. A bat monitoring programme would be employed as set out in the Bat Mitigation and Monitoring Plan, including activity surveying and carcass detection.
9: Ornithology	Breeding birds	Pre-construction/Construction	Breeding Bird Protection Plan (BBPP) set up to avoid destruction or disturbance of any nest site (or lek) with species specific temporal and spatial restrictions around construction works should any active nest be located. The BBPP would include pre-construction breeding bird surveys, and if any breeding or lekking does occur within potential disturbance zones, all construction works would be halted immediately, and a disturbance risk assessment prepared.
	Habitat	Operation	The HMP would increase the amount of native woodland coverage which would help compensate for any habitat loss or displacement effects on black grouse and would enhance the existing habitat for species such as goshawk.
10: Noise	Construction noise	Construction	Construction work would generally be restricted to standard working hours and exclude Sundays unless specifically agreed otherwise. A noise control plan would be produced which would include procedures for ensuring compliance with statutory noise control limits and procedures for minimising noise from construction related traffic.
	Blasting	Construction	A pre-blasting noise management programme would be prepared which would identify sensitive receptors, contain details of proposed frequency of blasting and proposed monitoring procedures. Blasting would be designed to maximise efficiency and reduce transmission of noise and vibration.
	Operational noise	Operation	A curtailment strategy may be applied to the proposed Development, using reduced noise modes, for a range of wind speeds and directions to ensure that the cumulative noise levels are within specified and agreed limits.
11: Archaeology & Cultural Heritage	Preservation	Construction	Surviving heritage assets within 50 m of any proposed access track, turbine or infrastructure, would be marked out for avoidance during construction. Marking out would be achieved using high visibility marker posts set 5 m from the edge of the identified asset and retained for the duration of construction. Heritage assets identified in the assessment for marking out are Cairnderry Cairn and Fardin field and sheepfold.
	Archaeological watching brief	Construction	A watching brief would be required on any works near Cairnderry Cairn associated with widening and upgrading the existing access track, formation of the site entrance and temporary construction compound. This is to ensure that any archaeological remains encountered during ground-breaking works are identified, recorded, investigated and reported. The scope of any requirement for a watching brief would be agreed with the relevant Council's archaeological advisor.
	Excavation of remains	Construction	If significant discoveries are made during any archaeological monitoring works, and it is not possible to preserve the discovered site or features in situ, then provision would be made for the excavation, where possible, of any archaeological remains encountered. To include the production of written reports with post-excavation analysis and publication of results, where appropriate.
	Archaeological guidelines	Construction	Written guidelines would be issued for use by all construction contractors outlining the need to avoid causing unnecessary damage to known heritage assets.

EIA Report Chapter	Matter / Effect Requiring Mitigation	Timing / Phase	Mitigation
	Archaeological enhancement	Operation	Some archaeological interpretation, related to Cairnderry Cairn, would be presented within the proposed conversion of part of the temporary construction compound, near to the site entrance, to a recreational car park.
12: Access, Traffic & Transport	Construction Traffic Management Plan	Construction	A Construction Traffic Management Plan (CTMP) would be prepared and agreed with the Council and Transport Scotland prior to construction work commencing. The CTMP may include the following measures: • All dry materials delivery lorries would be sheeted to reduce dust and stop spillage on public roads; • Training, audit and disciplinary measures to prevent construction vehicles from carrying mud and debris onto the carriageway; • Appropriate traffic management measures at the Site access junction which would be regularly inspected by the site manager; • Directional signage to enforce delivery routes; • Induction for all drivers including a safety briefing and route requirement details; and • Travel Plan to encourage lift sharing/crew bus access for construction staff.
	Abnormal loads	Construction	The following measures would be undertaken: • An agreed access strategy for turbine loads would be confirmed post consent once the turbine supplier and turbine details have been confirmed. • A police escort would be required and would be further supplemented by a civilian pilot car. • The abnormal loads convoys would be no more than three Abnormal Indivisible Loads (AIL) long, or as advised by police. • Times for convoy travel would be agreed with Police Scotland. • Operation of the convoy management would be detailed in a Traffic Management Plan. The convoy management plan would be developed with Transport Scotland and Dumfries & Galloway Council, and would include details of hold point locations along the delivery route where traffic would overtake loads under Police control.
	Information	Construction	The following measures would be undertaken: • Information on turbine convoys would be provided to local media outlets to inform the public. • Advanced warning signs could be installed on the approaches to the affected road network, subject to the agreement of the road authorities. • Balance of Plant contract would specify the route suppliers must take which would be enforced by the site agent and aided by signage.
	Road wear and tear	Construction	An agreement on wear and tear on road infrastructure caused directly by construction traffic would be established prior to construction commencing.
	Street furniture	Construction	Any street furniture that is temporarily removed to enable Abnormal Indivisible Load (AIL) movements would be fully reinstated following delivery period.
13: Socio-economics, Tourism & Recreation	Maximising local impact	Construction and Operation	'Meet the Developer / Contractor Days' inviting local companies to attend and meet representatives of the Applicant's development, construction and operational teams. The Applicant would seek to secure positive benefits for the local economy by encouraging the use of local labour, manufacturers and suppliers where possible.
14: Other Issues	Aviation	Operation	A surveillance system may be required to mitigate the potential effects of the proposed Development on the Glasgow Prestwick Radar. The requirement for this would be determined following consultation with Glasgow Prestwick Airport and the Civil Aviation Authority (CAA).
	Aviation lighting	Operation	As the turbines are above 150 m height, aviation lighting would be installed to aid detection by aircraft. To minimise light pollution from the turbine aviation lighting, light minimisation strategies are being considered, including an aviation detection lighting system.
	Forestry felling	Construction	Appropriate compensatory planting would be required. The extent, location and composition of such planting to be agreed with FLS prior to the commencement of operation of the windfarm.

Table 15.2 Residual Effects - Construction

Description of Effect (Construction phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Landscape and Visual					
Landscape and visual effects of the proposed Development are considered collectively within the assessment and are detailed in Table 15.3 below. Please note the Landscape & Visual Impact Assessment (LVIA) focuses on the effects of the proposed Development in its operational phase which is also considered as the residual effects.					
Hydrology, Hydrogeology, Geology & Soils					
Changes to groundwater flow including localised drying of peat	Negligible to minor	Adverse	Minimising dewatering requirement by timely and efficient excavation and subsequent concrete pouring and backfilling. HMP implementation.	Negligible	Adverse
Removal of and impact on peat	Minor	Adverse	Floating road segments over deep peat. Appropriate management and onsite re-use of peat (Peat Management Plan). Restriction of works to set construction areas and corridors.	Minor	Adverse
Pollution impact from sediment runoff/ chemical contaminated runoff	Minor	Adverse	Form working platforms to ensure runoff away from watercourses. Restriction of works to set construction areas and corridors.	Minor	Adverse
Pollution impacts from forestry felling	Minor	Adverse	No specific measures beyond embedded mitigation.	Minor	Adverse
Peat landslide impact on watercourses	Minor	Adverse	Restriction of works to set construction areas and corridors.	Minor	Adverse
Impact on the integrity of banking	Minor	Adverse	No specific measures beyond embedded mitigation.	Minor	Adverse
Compaction of soils	Negligible to Minor	Adverse	Restriction of works to set construction areas and corridors	Negligible	Adverse
Ecology & Biodiversity					
Wet heath	Barely perceptible spatial	Adverse	Embedded mitigation, adoption of good practice, plus general habitat and pollution control measures: Habitats (general): • turbine key-hole buffers managed to ensure that regenerating trees do not exceed 3 m in height. • site establishment and general surface strip works to include careful removal segregation, storage of vegetated turves, to promote restoration. Pollution control measures: • protection of watercourses by provision and maintenance of silt fencing at crossing points; • check-dams supplemented by silt fencing within trackside drainage ditches for the duration of the construction programme; • spill kits; • drainage measures around all compounds and lay-downs; • use of biodegradable lubricants and hydraulic fluid products; and • light pollution controls.	Barely perceptible spatial	Adverse
Dry heath	Barely perceptible spatial	Adverse		Barely perceptible spatial	Adverse
Bog habitats	None	n/a	Implementation of Habitat Management Plan	Low	Beneficial
Ornithology					
Black grouse	Negligible (Not significant)	Adverse	Breeding Bird Protection Plan (BBPP) and pre-construction surveys. Spatial and temporal restrictions of construction activity if required.	Negligible	Adverse
Osprey	Negligible (Not significant)	Adverse		Negligible	Adverse

Description of Effect (Construction phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Goshawk	Minor (Not significant)	Adverse		Minor	Adverse
Noise					
Construction Noise	Not Significant	Adverse	Standard mitigation measures and adherence to various legislation/directives, liaison with local council and residents on noise issues.	Not Significant	Adverse
Archaeology & Cultural Heritage					
Potential direct impact on Cairnderry Cairn (1 (SM1007))	Major	Adverse	Mark out for avoidance during construction period, ensuring preservation in situ.	None	n/a
Potential direct impact on Fardin, field and sheepfold (9)	Minor	Adverse	Mark out for avoidance during construction period, ensuring preservation in situ.	None	n/a
Possible direct impact on buried archaeological remains	Unknown (Moderate)	Adverse	Watching brief to a strategy and standard acceptable to Dumfries & Galloway Council Archaeology Service	Minor	Adverse
Access, Traffic and Transport					
On the Newton Stewart bypass and A714					
Severance	Minor	Neutral	None Required	Insignificant	Neutral
Driver Delay	Minor	Adverse	Convoy management points, driver information on construction traffic and consider use of onsite batching to reduce HGV trips	Slight	Adverse
Pedestrian Delay	Minor	Neutral	None Required	Insignificant	Neutral
Pedestrian Amenity	Minor	Neutral	None Required	Insignificant	Neutral
Fear and Intimidation	Minor	Neutral	None Required	Insignificant	Neutral
Accidents and Safety	Moderate	Adverse	Improved driver information, traffic management plan, convoy management plan and consider use of onsite batching to reduce HGV trips	Slight	Adverse
Socio-economic, Tourism and Recreation					
Economic Impact of up to £7.7 million Gross Value Added (GVA) and 116 job years in Dumfries and Galloway and South Ayrshire	Minor	Beneficial	n/a	Minor	Beneficial
Economic impact of up to £35.1million GVA and 542 job years in Scotland	Negligible	Beneficial	n/a	Negligible	Beneficial
Other Issues					
Aviation – effects on aviation (obstruction)	Negligible	Neutral	None	Negligible	Neutral
Aviation – effects on aviation and radar interests (interference)	Negligible	Neutral	None	Negligible	Neutral
Shadow Flicker	Negligible	Neutral	None	Negligible	Neutral

Table 15.3 Residual Effects - Operation

Description of Effect (Operational phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Landscape and Visual					
Landscape Character Types (LCT)					
South Ayrshire - Plateau Moorlands with Forestry and Windfarms (18c)	Significant locally within 3 km	Adverse	None	**Significant** locally within 3 km	Adverse
South Ayrshire - Rugged Uplands with Loch and Forest (21) and East Ayrshire - Rugged Uplands - Lochs & Forest (21)	Significant locally within 2.5 km and 4.5-9.5 km to the east	Adverse	None	**Significant** locally within 2.5 km and 4.5-9.5 km to the east	Adverse
South Ayrshire - Intimate Pastoral Valley (13)	Significant from northern upper sides of Stinchar Valley	Adverse	None	**Significant** from northern upper sides of Stinchar Valley	Adverse
Dumfries and Galloway - Plateau Moorland with Forest (17a)	Not significant	Adverse	None	Not significant	Adverse
Dumfries and Galloway - Rugged Granite Upland (21)	Significant across west facing slopes of Merrick foothills at 6-8 km	Adverse	None	**Significant** across west facing slopes of Merrick foothills at 6-8 km	Adverse
The effect of the proposed Development on the landscape character of all other LCTs within 45 km LVIA study area is assessed as not significant.					
Landscape Designations					
South Ayrshire Scenic Area (SA)	Significant within localised areas of the SA immediately to the north of the proposed Development; extending to 4.5-9.5 km to the east across Rugged Uplands with Loch and Forest LCT; and from northern upper sides of Stinchar Valley.	Adverse	None	**Significant** within localised areas of the SA immediately to the north of the proposed Development; extending to 4.5-9.5 km to the east across Rugged Uplands with Loch and Forest LCT; and from northern upper sides of Stinchar Valley.	Adverse
Galloway Hills Regional Scenic Area	Significant across west facing slopes of Merrick foothills at 6-8 km	Adverse	None	**Significant** across west facing slopes of Merrick foothills at 6-8 km	Adverse
The effect of the proposed Development on the landscape character of all other landscape designations within 45 km LVIA study area is assessed as not significant.					
Viewpoints					
1 – Chirmorie Cairn	Not significant	Adverse	None	Not significant	Adverse
2 – Minor road to the south of Barrhill	Not significant	Adverse	None	Not significant	Adverse
2 – Night Time: Minor road to the south of Barrhill	Not significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	Not significant	Adverse
3 – B7027 Knockycoid	Not significant	Adverse	None	Not significant	Adverse
4 – Southern Upland Way, Craig Airie Fell	Not significant	Adverse	None	Not significant	Adverse
5 – Knockdolian	Not significant	Adverse	None	Not significant	Adverse
6 – Southern Upland Way, Hill of Ochiltree	Not significant	Adverse	None	Not significant	Adverse
7 – Auchensoul Hill	Significant	Adverse	None	**Significant**	Adverse

Description of Effect (Operational phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
8 – Merrick	Significant	Adverse	None	**Significant**	Adverse
9 – Barr (Glenginnet Road)	Not significant	Adverse	None	Not significant	Adverse
10 – A714, Creeside	Significant	Adverse	None	**Significant**	Adverse
10 – Night time:A714, Creeside	Not significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	Not significant	Adverse
11 – Mullwharchar	Not significant	Adverse	None	Not significant	Adverse
12 – National Cycle Route 7 near Doughty Hill	Not significant	Adverse	None	Not significant	Adverse
13 – Shalloch on Minnoch	Significant	Adverse	None	**Significant**	Adverse
14 – Corseine	Significant	Adverse	None	**Significant**	Adverse
15 – Colmonell	Not significant	Adverse	None	Not significant	Adverse
16 – Byne Hill	Not significant	Adverse	None	Not significant	Adverse
17 – Kirriereoch Picnic Site	Significant	Adverse	None	**Significant**	Adverse
17 – Night time: Kirriereoch Picnic Site	Significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	**Significant**	Adverse
18 – B734 Stinchar Valley	Not significant	Adverse	None	Not significant	Adverse
19 – B734 Approach to Barr	Significant	Adverse	None	**Significant**	Adverse
19 – Night time: B734 Approach to Barr	Not significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	Not significant	Adverse
20 – New Barr Trail (near White Knowes)	Significant	Adverse	None	**Significant**	Adverse
21 – Barr Trail (Barr to Loch Doon Cycle Route)	Significant	Adverse	None	**Significant**	Adverse
22 – Brown Carrick Hill	Not significant	Adverse	None	Not significant	Adverse
23 - Arran, Kildonan (on southern tip of Arran)	Not assessed, illustrative viewpoint only				
24 - Benyellary	Not assessed, illustrative viewpoint only				
24 – Night time: Benyellary	Significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	**Significant**	Adverse
Transport / Long Distance Recreational Routes					
A714	Significant over two closest sections with visibility, to the north of Pinmore and section between Carinderry and Eldrig	Adverse	None	**Significant** over two closest sections with visibility, to the north of Pinmore and section between Cairnderry and Eldrig	Adverse
B734	Significant between Penwhapple and Barr, on the approach to Barr, and in views between Barr and Pinmore along the Stinchar	Adverse	None	**Significant** between Penwhapple and Barr, on the approach to Barr, and in views between Barr and Pinmore along the Stinchar	Adverse

Description of Effect (Operational phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	**Beneficial / Adverse**		**Significance**	**Beneficial / Adverse**
	Valley and travelling between Colmonell and Poundland.			Valley and travelling between Colmonell and Poundland.	
Southern Upland Way (SUW) Section 3 – The Moors (New Luce to Bargrennan)	Not significant	Adverse	None	Not significant	Adverse
National Cycle Route 7 (NCR7)	Significant over closest section, near Kirriereoch	Adverse	None	**Significant** over closest section, near Kirriereoch	Adverse
The effect of the proposed Development on the views experienced from all other transport and long distance recreational routes within 45km LVIA study area is assessed as not significant.					
Hydrology, Hydrogeology, Geology & Soils					
Increased rate of surface water runoff	Negligible	Adverse	No specific measures beyond embedded mitigation.	Negligible	Adverse
Long-term changes to groundwater flow regime and dewatering of peat	Negligible to Minor	Adverse	HMP implementation	Negligible	Adverse
Impacts on fluvial geomorphology	Negligible	Adverse	No specific mitigation measures beyond embedded mitigation.	Negligible	Adverse
Impacts on onsite and downstream fluvial flood risk	Negligible	Adverse	No specific mitigation measures beyond embedded mitigation.	Negligible	Adverse
Ecology & Biodiversity					
Bog habitats	None	n/a	Implementation of Habitat Management Plan	Low	Beneficial
Nyctalus bats: collision/barotrauma risk	Low	Adverse	Standard inbuilt mitigation through design, including wide keyhole buffers.	Barely perceptible spatial	Adverse
Pipistrelle bats: collision/barotrauma risk	Low-medium	Adverse	Standard inbuilt mitigation through design, including wide keyhole buffers, plus monitoring to assess the need for curtailment of WTG4 between sunset and sunrise for April-October	Barely perceptible spatial	Adverse
Ornithology					
Displacement					
Black grouse	Negligible (Not significant)	Adverse	None required (HMP would provide enhanced habitat for black grouse)	Negligible	Adverse
Osprey	Negligible (Not significant)	Adverse	None required	Negligible	Adverse
Goshawk	Negligible (Not significant)	Adverse	None required (HMP would provide enhanced habitat for goshawk)	Negligible	Adverse
Collision Risk					
Black grouse	Negligible (Not significant)	Adverse	None required	Negligible	Adverse
Osprey	Negligible (Not significant)	Adverse	None required	Negligible	Adverse
Goshawk	Minor (Not significant)	Adverse	None required	Minor	Adverse
Lighting Effects					
All IOFs	Minor (Not significant)	Adverse	None required	Minor	Adverse
Noise					
Operational noise lies well within planning requirements.	Not Significant	Adverse	None necessary. Although, the turbines may be just audible at times.	Not Significant	Adverse

Description of Effect (Operational phase)	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Archaeology & Cultural Heritage					
Impacts on the setting of nine Scheduled Monuments within the Outer Study Area.	Minor	Adverse	None	Minor	Adverse
Impacts on the setting of one non-designated heritage asset of national heritage value: Cairn Hill Cairn (11677).	Moderate (Significant)	Adverse	None	**Moderate (Significant)**	Adverse
Impacts on the settings of 34 other non-designated heritage assets of national heritage value within the Outer Study Area.	Minor	Adverse	None	Minor	Adverse
Impacts on the settings of 18 Listed Buildings within the Outer Study Area.	Negligible	Neutral	None	Negligible	Neutral
Impact on the setting of Barr village Conservation Area within the Outer Study Area.	Negligible	Neutral	None	Negligible	Neutral
Access, Traffic and Transport					
No significant effects are predicted during the operational phase					
Socio-economic, Tourism and Recreation					
Annual economic impact of up to £0.7 million GVA and 9 jobs in Dumfries and Galloway and South Ayrshire	Negligible	Beneficial	n/a	Negligible	Beneficial
Annual economic impact of up to £1.1 million GVA and 15 jobs in Scotland	Negligible	Beneficial	n/a	Negligible	Beneficial
Annual payment of an estimated up to £1.2 million in Non-Domestic rates	Negligible	Beneficial	n/a	Negligible	Beneficial
Payments of community benefits	Unquantified	Beneficial	n/a	Unquantified	Beneficial
Effect on tourism assets	Negligible	n/a	n/a	Negligible	n/a
Effect on accommodation providers	Negligible	n/a	n/a	Negligible	n/a
Effect on core paths and recreational access	Negligible	Beneficial	n/a	Negligible	Beneficial
Other Issues					
Aviation – effects on aviation (obstruction)	Minor	Adverse	Aviation lighting would be installed as soon as practicable on erected turbines, in line with CAA requirements	Negligible	Neutral
Aviation – effects on aviation and radar interests (interference)	Negligible	Neutral	A surveillance system may be deployed as a precaution.	Negligible	Neutral
Shadow Flicker	Negligible	Neutral	None	Negligible	Neutral

Table 15.4 Residual Effects - Cumulative

Description of Cumulative Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Landscape and Visual					
Operational LVIA effects reported within **Table 15.3** consider the impact of the proposed Development with the existing baseline of operational and under construction windfarms. The cumulative LVIA assessment considered the proposed Development in relation to two potential future baseline scenarios, 'the consented scenario' and 'the application stage scenario'.					
Consented Scenario					
Landscape Character Type (LCT)					
Plateau Moorlands with Forestry and Windfarms (18c)	Not significant	Adverse	None	Not significant	Adverse
Rugged Uplands with Loch and Forest (21) and East Ayrshire - Rugged Uplands - Lochs & Forest (21)	Not significant	Adverse	None	Not significant	Adverse
Landscape Designations					
South Ayrshire Scenic Area (SA)	Not significant	Adverse	None	Not significant	Adverse
Galloway Hills Regional Scenic Area (RSA)	Not significant	Adverse	None	Not significant	Adverse
Viewpoints					
1 – Chirmorie Cairn	Not significant	Adverse	None	Not significant	Adverse
2 – Minor road to the south of Barrhill	Not significant	Adverse	None	Not significant	Adverse
6 – Southern Upland Way, Hill of Ochiltree	Not significant	Adverse	None	Not significant	Adverse
7 – Auchensoul Hill	Not significant	Adverse	None	Not significant	Adverse
8 – The Merrick	Not significant	Adverse	None	Not significant	Adverse
13 – Shalloch on Minnoch	Not significant	Adverse	None	Not significant	Adverse
14 – Corserine	Not significant	Adverse	None	Not significant	Adverse
24- Night time: Benyellary	Significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	**Significant**	Adverse
Visual Receptors					
A714	Not significant	Adverse	None	Not significant	Adverse
B734	Not significant	Neutral	None	Not significant	Neutral
Glasgow South Western Line (Ayr – Stranraer)	Significant sequential visibility	Adverse	None	**Significant** sequential visibility	Adverse
Southern Upland Way Section 3 The Moors (New Luce to Bargrennan) Short Walks (W7, W8)	Not significant	Neutral	None	Not significant	Neutral
Application Stage Scenario					
Landscape Character Type (LCT)					

Description of Cumulative Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Plateau Moorlands with Forestry and Windfarms (18c)	Not significant	Adverse	None	Not significant	Adverse
Rugged Uplands with Loch and Forest (21)	Not significant	Adverse	None	Not significant	Adverse
Intimate Pastoral Valley (13)	Not significant	Adverse	None	Not significant	Adverse
Landscape Designations					
South Ayrshire Scenic Area (SA)	Not significant	Adverse	None	Not significant	Adverse
Galloway Hills Regional Scenic Area (RSA)	Not significant	Adverse	None	Not significant	Adverse
Viewpoints					
1 – Chirmorie Cairn	Not significant	Adverse	None	Not significant	Adverse
2 – Minor road to the south of Barrhill	Not significant	Adverse	None	Not significant	Adverse
5 - Knockdolian	Not significant	Adverse	None	Not significant	Adverse
6 – Southern Upland Way, Hill of Ochiltree	Not significant	Adverse	None	Not significant	Adverse
7 – Auchensoul Hill	Not significant	Adverse	None	Not significant	Adverse
8 – The Merrick	Not significant	Adverse	None	Not significant	Adverse
13 – Shalloch on Minnoch	Not significant	Adverse	None	Not significant	Adverse
14 - Corserine	Not significant	Adverse	None	Not significant	Adverse
24- Night time: Benyellary	Significant	Adverse	Light minimisation measures on aviation lighting on turbines being considered.	**Significant**	Adverse
Visual Receptors					
A714	Not significant	Adverse	None	Not significant	Adverse
Glasgow South Western Line (Ayr – Stranraer)	Significant sequential visibility	Adverse	None	**Significant** sequential visibility	Adverse
Southern Upland Way Section 3 The Moors (New Luce to Bargrennan) Short Walks (W7, W8)	Not significant	Neutral	None	Not significant	Neutral
Hydrology, Hydrogeology, Geology & Soils					
No significant cumulative effects are predicted.					
Ecology & Biodiversity					
Bat species	Barely perceptible spatial	Adverse	None required	Barely perceptible spatial	Adverse
Ornithology					
Cumulative assessment not considered necessary					

Description of Cumulative Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Noise					
Minor risk of combined/cumulative operational noise levels exceeding relevant limits at Shalloch Well.	Significant	Adverse	Potential application of appropriate precautionary curtailment measures to the Clauchrie turbines, in order to mitigate impacts.	Not Significant	Adverse
Archaeology & Cultural Heritage					
Cumulative impact of the setting of Cairn Hill Cairn.	Moderate (Significant)	Adverse	None	**Moderate (Significant)**	Adverse
Cumulative impact on the setting of nine Scheduled Monuments within the Outer Study Area.	Minor	Adverse	None	Minor	Adverse
Cumulative impacts on the settings of 34 other non-designated heritage assets of national heritage value within the Outer Study Area.	Minor	Adverse	None	Minor	Adverse
Cumulative impacts on the settings of 18 Listed Buildings within the Outer Study Area.	Negligible	Neutral	None	Negligible	Neutral
Cumulative impact on the setting of Barr village Conservation Area within the Outer Study Area.	Negligible	Neutral	None	Negligible	Neutral
Access, Traffic and Transport					
No significant cumulative effects are predicted.					
Socio-economic, Tourism and Recreation					
Economic impact on economies of Dumfries and Galloway and South Ayrshire	Negligible	Beneficial	n/a	Negligible	Beneficial
Effect on tourism economy	Negligible	n/a	n/a	Negligible	n/a
Other Issues					
Aviation Interests	Minor	Adverse	Aviation lighting would be installed as soon as practicable on erected turbines, in line with CAA requirements. This may include an aviation detection system.	Negligible	Neutral

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