

Enoch Hill Wind Farm

Further Environmental Information

Volume 1: Main Report

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Report for

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Contents

Volume 1 Main Report

1.	Introduction	1-1
1.1	Background	1-1
1.2	How to Read this FEI	1-2
1.3	Enoch Hill Wind Farm – Revised Layout	1-3
1.4	The Project Team	1-4
1.5	References	1-4
2.	EIA Process	2-1
2.1	Overview of EIA	2-1
2.2	EIA Methodology	2-1
2.3	Scope of the EIA	2-1
	ES Consultation Responses	2-1
	Cumulative Effects	2-6
2.4	Community Engagement	2-12
2.5	References	2-12
3.	Site Selection and Design Evolution	3-1
3.1	Site Identification Process	3-1
3.2	Site Context	3-1
3.3	Design Evolution	3-1
	Site Design Iterations	3-1
4.	Description of the Proposed Development	4-1
4.1	Introduction	4-1
4.2	Development & Design Layout	4-1
	Turbine Layout	4-2
	Micrositing	4-3
	Wind Turbine Parameters	4-4
	On-site Access Tracks	4-4
	Infrastructure Layout	4-5
	Temporary Construction Compound and Laydown Area	4-5
	Off-site Electrical Connection	4-6
4.3	Proposed Site Access	4-7
	Site Entrance	4-7
	Abnormal Loads	4-7
	General Construction Traffic	4-7
4.4	Construction Process	4-7
	Proposed Programme	4-7
	Hours of Working	4-8
	Standard Construction Working Practices	4-9
	Health and Safety during Construction	4-9
	Environmental Management during Construction	4-10
	Construction Method Statement (CMS)	4-10

4.5	Construction Details	4-11
	Materials Import	4-18
	Concrete Batching Plants	4-20
	Post-Construction Development, Site Restoration and Commissioning	4-21
4.6	Operational Details	4-21
	Land Management	4-21
	Meteorological Effects and Turbine Control	4-21
	Turbine Maintenance	4-22
	Environmental Management during Operation	4-22
	Site Waste Management	4-22
4.7	Decommissioning Details	4-22
	Wind Farm Decommissioning Requirements	4-22
	Decommissioning Process	4-23
	Control Building and Distribution System Decommissioning	4-23
	Access Track Decommissioning	4-23
4.8	References	4-23
5.	Planning Policy Context	5-1
5.1	Introduction	5-1
5.2	Changes in Planning Policy	5-1
	National Planning Policy, Guidance and Advice	5-1
	Development Plan	5-1
	Other Material Considerations	5-2
5.3	References	5-8
6.	Renewable Energy Policy, Carbon Balance and Peat Management	6-1
6.1	Introduction and Overview	6-1
6.2	Changes to Renewable Energy, Climate Change and Planning Policy Frameworks	6-1
	Changes in Energy & Climate Change Policy Frameworks	6-1
	Renewable Energy Targets	6-2
	Changes to Planning Policy Context	6-2
6.3	Carbon Savings	6-3
6.4	Carbon Storage and Emissions	6-4
6.5	Carbon Balance and Payback Calculation	6-4
6.6	Summary	6-6
6.7	References	6-6
7.	Noise	7-1
7.1	Introduction and Overview	7-1
7.2	Changes to Policy and Legislative Context	7-1
7.3	Application Consultation Responses	7-1
	Proposed Noise Condition Limits	7-2
	Post Commissioning Noise Monitoring	7-3
7.4	Revised Layout and Turbine Noise Level Data	7-4
	Potential Receptors	7-4
	Proposed Development – Turbine Sound Power Levels	7-4
	Cumulative Developments – Turbine Sound Power Levels	7-5
7.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	7-7
7.6	Evaluation of Residual Effects	7-8
7.7	Conclusions	7-8

8.	Shadow Flicker	8-1
8.1	Introduction and Overview	8-1
8.2	Changes to Policy and Legislative Context	8-1
8.3	Application Consultation Responses	8-1
8.4	Implications of Revised Layout	8-1
8.5	Shadow Flicker Predicted Effects	8-1
8.6	Evaluation of Residual Effects	8-1
8.7	Conclusions	8-1
8.8	References	8-1
9.	Landscape and Visual	9-1
9.1	Introduction	9-1
	Chapter Structure	9-1
9.2	Consultation and Scope of Assessment	9-2
	East Ayrshire Council	9-2
	Scottish Natural Heritage	9-5
9.3	Methodology	9-6
	Assessment Parameters	9-7
	Defining the Study Area	9-7
	Landscape Planning Policy and Guidance	9-7
	Landscape and Visual Impact Assessment	9-8
	Cumulative Wind Energy Development	9-9
9.4	Zone of Theoretical Visibility and Viewpoint Analysis	9-11
	Zone of Theoretical Visibility (ZTV) Analysis	9-12
	Viewpoint and Cumulative Viewpoint Analysis	9-12
9.5	Baseline Description	9-18
	Baseline Landscape Receptors	9-18
	Baseline Visual Receptors	9-21
	Information Gaps	9-24
	Future Baseline	9-24
9.6	Landscape Design Statement and Mitigation	9-24
	Landscape Design Objectives	9-24
	Landscape Design Considerations	9-25
	Design Evolution	9-27
	Mitigation Inherent in Proposed Development	9-28
9.7	Residual Landscape Effects	9-28
	Overview of the Landscape Character of the Development Site	9-28
	Identification of the Landscape Character of the Development Site	9-29
	Direct Landscape Effects: Southern Uplands and Forestry: Enoch Hill LCA	9-30
	Direct Landscape Effects: Southern Uplands: Benty Cowan Hill LCA	9-37
	Indirect Effects on the Surrounding Landscape Character	9-41
	Landscape Designations: Afton SLCA	9-43
9.8	Residual Visual Effects	9-45
	Visual Effects during Construction, Operation and Decommissioning	9-45
	Visual Receptors: Settlements and Residential Properties	9-46
	Visual Effects on Views from Transport Routes	9-52
	Visual Receptors: Recreational Routes	9-57
	Visual Effects on Views from Recreational and Tourist Destinations	9-61
9.9	Summary of Residual Landscape and Visual Effects	9-64
9.10	Summary and Conclusions	9-71
	Consultation and Scope of Assessment	9-71
	Viewpoint and Cumulative Viewpoint Analysis	9-72
	Landscape Design Statement and Mitigation	9-72
	Mitigation Inherent in Proposed Development	9-74
	Landscape Effects	9-74
	Visual Effects	9-75
	Response to Consultation	9-75
	Conclusions	9-76
9.11	References	9-77

10.	Historic Environment	10-1
10.1	Introduction and Overview	10-1
10.2	Changes to Policy and Legislative Context	10-1
10.3	Application Consultation	10-2
10.4	Implications of Revised Layout	10-5
10.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	10-5
	Operational	10-5
	Cumulative	10-7
10.6	Evaluation of Residual Effects	10-7
10.7	Conclusions	10-7
10.8	References	10-7
	Documentary Sources	10-7
	Online Sources	10-7
11.	Ecology	11-1
11.1	Introduction and Overview	11-1
11.2	Changes to Policy and Legislative Context	11-1
11.3	Application Consultation Responses	11-2
11.4	Implications of Revised Layout	11-5
11.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	11-6
	Construction, Operational and Decommissioning Disturbance Effects	11-6
	GWDTEs	11-8
	Running Water, Salmonids and Freshwater Pearl Mussel	11-8
	Otter and Water Vole	11-8
	Badger and Herpetofauna	11-9
	Bats	11-9
	Cumulative	11-9
11.6	Evaluation of Residual Effects	11-9
11.7	Conclusions	11-10
11.8	References	11-10
12.	Ornithology	12-1
12.1	Introduction and Overview	12-1
12.2	Changes to Policy and Legislative Context	12-1
12.3	Application Consultation Responses	12-1
12.4	Implications of Revised Layout	12-3
12.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	12-3
	Construction, Operational and Decommissioning Disturbance to Breeding and Wintering Birds	12-3
	Collision-Risk (Operational Effects)	12-3
12.6	Evaluation of Residual Effects	12-4
12.7	Conclusions	12-4
12.8	References	12-4

13.	Geology, Hydrology and Hydrogeology	13-1
13.1	Introduction and Overview	13-1
13.2	Changes to Policy and Legislative Context	13-1
13.3	Application Consultation Responses	13-2
13.4	Implications of Revised Layout	13-3
	Potential Receptors	13-3
	Potentially Significant Effects	13-4
13.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	13-4
	Surface Water Courses (Flows and Quality)	13-4
	Groundwater Body (Flows and Quality)	13-5
	Private Water Supplies	13-5
	GWDTEs	13-5
	Peat Hydrology	13-6
13.6	Evaluation of Residual Effects	13-6
13.7	Conclusions	13-6
13.8	References	13-6
14.	Traffic and Transport	14-1
14.1	Introduction and Overview	14-1
14.2	Changes to Policy and Legislative Context	14-1
14.3	Application Consultation Responses	14-1
14.4	Implications of Revised Layout	14-3
	Traffic Flows	14-3
14.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	14-4
	Construction Effects	14-4
	Operational Effects	14-7
	Decommissioning Effects	14-8
14.6	Evaluation of Residual Effects	14-10
14.7	Conclusions	14-11
14.8	References	14-11
15.	Socio-economics, Tourism and Recreation	15-1
15.1	Introduction and Overview	15-1
15.2	Changes to Policy and Legislative Context	15-1
15.3	Baseline Review	15-2
15.4	Application Consultation Responses	15-3
15.5	Implications of Revised Layout	15-4
15.6	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	15-4
	Economic and Employment Effects	15-4
	Accommodation	15-6
	Land Use and Public Access	15-6
	Recreation	15-6
	Tourism	15-9
15.7	Evaluation of Residual Effects	15-9
15.8	Conclusions	15-10
15.9	References	15-10

16.	Infrastructure, Telecommunications and Safety	16-1
16.1	Introduction and Overview	16-1
16.2	Changes to Policy and Legislative Context	16-1
16.3	Application Consultation Responses	16-1
16.4	Implications of Revised Layout	16-2
16.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	16-2
16.6	Evaluation of Residual Effects	16-3
16.7	Conclusions	16-3
17.	Aviation	17-1
17.1	Introduction and Overview	17-1
17.2	Changes to Policy and Legislative Context	17-1
17.3	Application Consultation Responses	17-1
17.4	Implications of Revised Layout	17-2
17.5	Predicted Effects: Construction, Operation, Decommissioning and Cumulative	17-3
	GPA Operational Phase Effects	17-3
	NATS Operational Phase Effects	17-3
	MOD Operational Phase Effects	17-3
17.6	Evaluation of Residual Effects	17-3
	GPA	17-3
	NATS	17-4
	MOD	17-4
17.7	Conclusions	17-4
17.8	References	17-4
18.	Summary of Mitigation and Residual Effects for the Proposed Development	18-1
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Table 2.1	ES consultation Responses	2-1
Table 2.2	Cumulative Wind Energy Developments (from ES Table 9.4) Removed from Updated CLVIA	2-6
Table 2.3	Cumulative Wind Energy Developments (as at 12th August 2016)	2-7
Table 3.1	Design Iterations	3-1
Table 4.1	Key Development Features	4-2
Table 4.2	Wind Turbine and Permanent Anemometry Mast Locations	4-2
Table 4.3	Footprint Area by Component	4-6
Table 4.4	Typical Access Track Construction Techniques	4-12
Table 4.5	Watercourse Crossing Locations	4-13
Table 4.6	Summary of Rock Volumes Required during Construction	4-18
Table 4.7	Estimated Volumes of Rock Available from the Borrow Pit	4-19
Table 4.8	Estimated Volume of Concrete	4-20
Table 5.1	Relevant Proposed Policies and Proposals from the East Ayrshire LDP Proposed Plan (2015) as modified by the East Ayrshire LDP Examination Report (2016)	5-4
Table 6.1	Potential CO ₂ Savings and Electricity Generation	6-4
Table 6.2	Payback in years for each Scenario used in the Carbon Calculator	6-6
Table 7.1	Revised Layout Turbine Coordinates	7-4
Table 7.2	Reassessed Noise Sensitive Receptors	7-4
Table 7.3	Proposed Development – Assessment Envelope Sound Power Levels	7-5
Table 7.4	Sound Power Levels – Frequency Spectrum	7-5
Table 7.5	Cumulative Wind Developments	7-6

Table 7.6	Sound Power Levels for Cumulative Development Wind Farms	7-6
Table 7.7	Sound Power Level Spectrum for Cumulative Development Turbines	7-6
Table 9.1	Summary of EAC Consultation Comments	9-3
Table 9.2	Summary of SNH Consultation Comments	9-6
Table 9.3	Evaluation of Landscape and Visual Effects	9-9
Table 9.4	Changes to Cumulative Wind Energy Development since the ES	9-10
Table 9.5	Wind Energy Development excluded from the Cumulative Assessment	9-11
Table 9.6	Summary of Viewpoint Analysis	9-15
Table 9.7	Landscape Character within 5km of the Proposed Development	9-20
Table 9.8	Comparison of Key Characteristics of the Southern Uplands and Forestry: Enoch Hill LCA	9-30
Table 9.9	Landscape Susceptibility of the Southern Uplands and Forestry: Enoch Hill LCA	9-33
Table 9.10	Landscape Susceptibility of the Southern Uplands: Benty Cowan Hill LCA	9-38
Table 9.11	Indirect Effects on Surrounding Landscape Character within 10km	9-42
Table 9.12	Visual Effects on Views from Settlements	9-47
Table 9.13	Visual Effects on Views from Transport Routes	9-53
Table 9.14	Visual Effects on Views from Recreational Routes within 5km and 10km	9-58
Table 9.15	Visual Effects on Views from Recreational and Tourist Destinations (within 10km)	9-61
Table 9.16	Summary and Evaluation of the Predicted Landscape Effects	9-66
Table 9.17	Summary and Evaluation of the Predicted Visual Effects	9-68
Table 10.1	Legislation and National Policy Changes Overview	10-2
Table 10.2	Consultation Points Raised in Relation to Historic Environment	10-3
Table 11.1	Consultation Points Raised in Relation to Ecological Receptors	11-2
Table 11.2	Permanent VER Habitat Losses (ha) of the Revised Layout Compared with the Original Layout	11-6
Table 11.3	Temporary VER Habitat Losses (ha) of the Revised Layout	11-7
Table 12.1	Consultation Points Raised by SNH and RSPB in Relation to Ornithology	12-1
Table 13.1	Consultation Responses Relating to Hydrology, Geology and Hydrogeology	13-2
Table 14.1	Consultation Points Raised in Relation to Traffic and Transport	14-1
Table 14.2	Traffic Flow Summary	14-3
Table 14.3	Estimated Traffic Generated As a Result of the Layout Design Presented in the ES and as a Result of the Proposed Revisions to the Layout	14-4
Table 14.4	Difference Between Traffic Generation Resulting from the Original Layout and the Revised Layout	14-5
Table 14.5	Monthly Traffic Movements over Construction Programme	14-6
Table 14.6	Summary of Cumulative Assessment	14-8
Table 14.7	Summary of Residual Effects	14-10
Table 15.1	Relevant ES Consultation Responses	15-3
Table 15.2	Assessment of Operational Effects on Public Rights of Way	15-8
Table 16.1	Consultation Responses Relating to Infrastructure, Telecommunications and Safety	16-2
Table 17.1	Stakeholder Consultation Activity	17-2

Volume 2 Illustrative Figures

Figure 1.1	Revised Site Layout
Figure 1.2	Revised Site Layout Compared to September 2015 Application Layout
Figure 4.1	Typical Wind Turbine Structure
Figure 4.2	Typical Road Construction
Figure 4.3	Typical Crane Hardstanding
Figure 4.4	Indicative Construction Compound
Figure 4.5	Typical Lattice Anemometry Mast
Figure 4.6	Typical Cable Trench Cross Section
Figure 4.7	Typical Substation and Control Building
Figure 4.8	Indicative Grid Connection Route
Figure 4.9	Proposed Site Entrance Junction Arrangement
Figure 4.10	Indicative Construction Programme
Figure 4.11	Typical Culvert
Figure 4.12	Typical Turbine Foundation
Figure 8.1	Shadow Flicker Study Area
Figure 9.1	Landscape and Visual Study Area
Figure 9.2	Zone of Theoretical Visibility (ZTV) to Blade Tip
Figure 9.3	Zone of Theoretical Visibility (ZTV) to Hub Height
Figure 9.4a	Detailed Zone of Theoretical Visibility (ZTV) to Blade Tip with Cumulative Wind Farms
Figure 9.4b	Detailed Zone of Theoretical Visibility (ZTV) to Blade Tip (allowing for forestry) with Cumulative Wind Farms
Figure 9.5a	Zone of Theoretical Visibility (ZTV) Calculated to Blade Tip Height out to 35km
Figure 9.5b	Zone of Theoretical Visibility (ZTV) Calculated to Blade Tip Height out to 20km
Figure 9.6	Cumulative Wind Farms (Existing and Consented)
Figure 9.7	Cumulative Wind Farms (Application and Scoping)
Figure 9.8a	Cumulative ZTV 1: Enoch, Existing and Consented Wind Farms
Figure 9.8b	Cumulative ZTV 1b: Enoch, Existing and Consented Wind Farms within 10km
Figure 9.9a	Cumulative ZTV 2a: Enoch, Windy Standard & Windy Standard Extension, Hare Hill & Hare Hill Extension and High Park Farm
Figure 9.9b	Cumulative ZTV 2b: Enoch, Windy Standard & Windy Standard Extension, Hare Hill & Hare Hill Extension and Existing High Park Farm within 10km
Figure 9.10a	Cumulative ZTV 3a: Enoch, Wether Hill and Afton
Figure 9.10b	Cumulative ZTV 3b: 10km Enoch, Wether Hill and Afton within 10km
Figure 9.11a	Cumulative ZTV 4a: Enoch and Application Wind Farms
Figure 9.11b	Cumulative ZTV 4b: 10km Enoch and Application Wind Farms within 10km
Figure 9.12a	Cumulative ZTV 5a: Enoch, South Kyle and Benbrack
Figure 9.12b	Cumulative ZTV 5b: 10km Enoch, South Kyle and Benbrack within 10km
Figure 9.13a	Cumulative ZTV 6a: Enoch, Pencloe and Garleffan
Figure 9.13b	Cumulative ZTV 6b: 10km Enoch, Pencloe and Garleffan within 10km
Figure 9.14	Cumulative ZTV 7: Existing and Consented Wind Farms within 10km and 35km
Figure 9.15	Cumulative ZTV 8: Application Wind Farms within 10km and 35km
Figure 9.16	Landscape Character within 35km
Figure 9.17	Detailed Landscape Character with Cumulative Wind Farms
Figure 9.18	Topography
Figure 9.19	Landscape Planning Designations
Figure 9.20	Long Distance Recreational Routes and Transport Routes
Figure 9.21	Core Paths and Other Local Recreational Routes
Figure 9.22	Settlements with Zone of Theoretical Visibility (ZTV) to Blade Tip
Figure 9.23a	Residential Visual Assessment
Figure 9.23b	Residential Viewpoint 1: Maneight Farm
Figure 9.23c	Residential Viewpoint 2: Meikle Hill
Figure 9.23d	Residential Viewpoint 3: Knockenlee
Figure 9.23e	Residential Viewpoint 4: Nith Lodge
Figure 9.23f	Residential Viewpoint 5: Craighouse
Figure 9.23g	Residential Viewpoint 6: Knockburnie
Figure 9.23h	Residential Viewpoint 7: Dalleagles Group of 8 Semi-Detached Properties
Figure 9.23i	Residential Viewpoint 8: Straid Farm
Figure 9.23j	Residential Viewpoint 9: Dalleagles
Figure 9.23k	Residential Viewpoint 10: Enoch Bank
Figure 9.23l	Residential Viewpoint 11: Dalleagles School House
Figure 9.23m	Residential Viewpoint 12: Dalleagles House
Figure 9.23n	Residential Viewpoint 13: Marshallmark
Figure 9.23o	Residential Viewpoint 14: Littlemark
Figure 9.23p	Residential Viewpoint 15: Lanehead
Figure 9.23q	Residential Viewpoint 16: Brochloch Farm
Figure 9.23r	Residential Viewpoint 17: Laglaff Farm
Figure 9.24a-l	Sequential Route Assessment: B741
Figure 9.25a-f	Sequential Route Assessment: A76
Figure 9.26	Zone of Theoretical Visibility (ZTV) to Blade Tip with Viewpoints
Figure 9.27a-d	Viewpoint 1: B741 North East of Dalmellington
Figure 9.28a-d	Viewpoint 2: B741 South West of New Cumnock
Figure 9.29a-d	Viewpoint 3: Core Path 667 Water of Deugh

Figure 9.30a-d	Viewpoint 4: New Cumnock Cemetery
Figure 9.31a-d	Viewpoint 5: Highpoint north of site (near Auchinross)
Figure 9.32a-d	Viewpoint 6: Blackcraig Hill South of New Cumnock
Figure 9.33a-e	Viewpoint 7: Lochside Hotel
Figure 9.34a-d	Viewpoint 8: Cairnsmore of Carsphairn
Figure 9.35a-c	Viewpoint 9: Bogton Loch
Figure 9.36a-d	Viewpoint 10: Fort Carrick
Figure 9.37a-d	Viewpoint 11: Auchenroy Hill
Figure 9.38a-d	Viewpoint 12: Corsencon Hill
Figure 9.39a-d	Viewpoint 13: Loch Doon Shore
Figure 9.40a-d	Viewpoint 14: A70 Between Cumnock and Prestwick
Figure 9.41a-c	Viewpoint 15: A76 North of Auchinleck
Figure 9.42a-c	Viewpoint 16: A70 North East of Cumnock
Figure 9.43a-c	Viewpoint 17: A76 Mauchline
Figure 9.44a-c	Viewpoint 18: Shalloch on Minnoch
Figure 9.45a-c	Viewpoint 19: Meikle Millyea
Figure 9.46a-c	Viewpoint 20: Kirriereoch Hill
Figure 9.47a-c	Viewpoint 21: Merrick
Figure 9.48a-c	Viewpoint 22: East Mount Lowther
Figure 9.49a-c	Viewpoint A: Drumbrochan Road
Figure 9.50a-c	Viewpoint B: Little Garclaugh, Upper Nith Valley
Figure 9.51a-e	360° Viewpoint 1: Cairnsmore of Carsphairn
Figure 9.52a-e	360° Viewpoint 2: Auchenroy Hill
Figure 9.53a-e	360° Viewpoint 3: Shalloch on Minnoch
Figure 9.54a-e	360° Viewpoint 4: Merrick
Figure 9.55a-e	360° Viewpoint 5: Blackcraig Hill South of New Cumnock
Figure 10.1	Viewpoint: Dalnean Hill
Figure 13.1	Hydrological Constraints
Figure 16.1	Infrastructure and Telecommunications

Volume 3 Technical Appendices

Appendix 4.A	Borrow Pit Assessment
Appendix 6.A	Peat Management Plan
Appendix 6.B	Peat Slide Risk Assessment
Appendix 6.C	Carbon Calculator Spreadsheet
Appendix 6.D	Carbon Calculator - Justification for Values Used
Appendix 7.A	Proposed Noise Condition Limits
Appendix 7.B	Cumulative Noise: Predicted Turbine Noise Levels at Receptors
Appendix 7.C	Noise: Noise assessment - Daytime
Appendix 7.D	Noise: Noise assessment – Night-time
Appendix 7.E	Noise: Noise assessment – Daytime (cumulative)
Appendix 7.F	Noise: Noise assessment – Night-time (cumulative)
Appendix 9.A	Landscape Design Statement
Appendix 9.B	Viewpoint Assessment
Appendix 9.C	Residential Visual Amenity Assessment
Appendix 9.D	Additional Landscape Character Survey Sheets
Appendix 9.E	Cumulative Wind Farm Development
Appendix 12.A	Collision Risk Modelling
Appendix 15.A	Calculation of Revised Economic and Employment Effects
Appendix 17.A	Summary of the results of the Primary Surveillance Radar Line of Sight analysis

1. Introduction

1.1 Background

- 1.1.1 The proposed Enoch Hill Wind Farm (the 'Proposed Development') is located in East Ayrshire approximately 6km to the south west of New Cumnock and approximately 7km to the north east of Dalmellington, close to the northern border of Dumfries and Galloway. The B741 runs in an east - west direction along the northern part of the Development Site, connecting the aforementioned settlements of Dalmellington and New Cumnock. Carsphairn Forest is located to the west and south of the Development Site boundary, with open cast mining to the north and open moorland to the east.
- 1.1.2 On 28 September 2015, E.ON Climate and Renewables UK Developments Ltd (the "Applicant") submitted an application for consent for the construction and operation of an electricity generating station, namely a wind farm, at Enoch Hill which was submitted to the Local Energy and Consents Unit (LECU) of the Scottish Government under section 36 of the Electricity Act 1989 (the "section 36 application" - LECU reference number EC00005256). The application was accompanied by an Environmental Statement (referred to throughout this FEI as the 'ES') which was prepared pursuant to the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (the EIA Regulations). The applicant also sought a Direction from the Scottish Ministers under section 57(2) of the Town and Country Planning (Scotland) Act 1997, that planning permission be deemed to be granted for the Proposed Development.
- 1.1.3 The application sought consent for a wind farm comprising up to 19 turbines (the "Original Layout"). In order to address issues raised by consultees and other stakeholders, which were primarily in relation to Landscape and Visual effects, the Proposed Development has been amended. Three turbines have been deleted (turbines 15, 16 and 18 of the previous layout have been deleted), with the position of the remaining up to 16 turbines having been amended to produce a cohesive layout that avoids the constraints identified during the original Environmental Impact Assessment (EIA) and reduces the environmental impacts that were of concern to key stakeholders as far as possible, carefully balancing landscape and visual effects with maximising production of renewable energy. The track layout and other infrastructure have also been revised, primarily as a result of the amendment in the location of turbines. Due to the reduction in the number of turbines and track length the number of borrow pit search areas have been reduced from three to two (the "Revised Layout"). The Development Site boundary remains unchanged, enclosing an area of approximately 1,466 hectares, while the total operational footprint has reduced from ~14.23ha to ~13.06ha. The changes to the Original Layout are briefly summarised in Section 1.3 of this Chapter with more detail contained in FEI **Chapter 4 - Description of the Proposed Development**.
- 1.1.4 Each turbine of the Revised Layout¹ would have a slightly increased individual electrical rated output of up to 3.4MW rather than up to 3.3MW for the Original Layout.
- 1.1.5 In the light of these amendments to the Proposed Development, it is necessary to revisit the original EIA. This Further Environmental Information (FEI) has therefore been prepared to report on the findings of the updated assessment to ascertain the likely effects of the Revised Layout.
- 1.1.6 In addition, in order to present the most up to date environmental information in relation to the Proposed Development, this FEI also addresses comments made by statutory consultees in their responses to the Original Layout and considers any updates in the environmental baseline, cumulative baseline, practice guidance, legislation or other changes in circumstances since the Application was submitted.
- 1.1.7 This FEI has been prepared by Amec Foster Wheeler on behalf of the Applicant and has been submitted under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (the EIA Regulations). This FEI will be advertised and made available for consultation over a

¹ Note the terms "Revised Layout" and "Proposed Development" are used interchangeably within this document.

28 day period as if it were a response to a formal request for further information under the EIA Regulations. This approach has been agreed with LECU.

1.2 How to Read this FEI

- 1.2.1 This FEI sets out the findings of further EIA carried out in relation to the Revised Layout of the Proposed Development and should be read in conjunction with the ES (September 2015). The information set out in this FEI either replaces, updates, supplements or amends the information set out in the ES.
- 1.2.2 All chapters of the ES have been reviewed to identify those aspects that need to be updated or replaced in light of the amendments to the Proposed Development (or in light of new circumstances that have occurred since the ES was completed). Where a chapter or assessment still remains current and does not need to be updated, supplemented, replaced or amended, no changes have been made and this is stated in the text of this FEI.
- 1.2.3 The structure of this FEI document mirrors the ES which accompanied the section 36 application and comprises three parts:
- ▶ Volume 1 Main Statement: details how the Revised Layout has been assessed and presents the findings of those assessments;
 - ▶ Volume 2 Illustrative Figures: figures to accompany the text presented in Volume 1; and
 - ▶ Volume 3 Technical Appendices: technical documentation to support the text presented in Volume 1.
- 1.2.4 Volume 1 is divided into the same 18 chapters as the ES as follows:
- ▶ Chapter 1 Introduction: Provides information on the background of the FEI and an overview of the changes to the Proposed Development;
 - ▶ Chapter 2 EIA Process: Describes any changes in the EIA process since the application was submitted;
 - ▶ Chapter 3 Site Selection and Design Evolution: Provides details of the factors that influenced the design of the Revised Layout presented;
 - ▶ Chapter 4 Description of the Proposed Development: Provides details of the changes to the design and the Revised Layout of the Proposed Development;
 - ▶ Chapter 5 Planning Policy Context: Presents any changes which have occurred in UK and Scottish policy on renewable energy generation which have occurred since the application was made; and
 - ▶ Chapter 6 Renewable Energy Policy, Carbon Balance and Peat: Provides details on relevant climate change policy, expected energy yield, CO₂ savings, carbon payback and peat management.
- 1.2.5 With regard to the Revised Layout, Chapters 7 to 17 report the findings of each of the environmental topics where the possibility of likely significant environmental effects was anticipated at scoping stage, and presents any changes to mitigation and enhancement measures which are proposed as a result of this. The environmental topics covered are:
- ▶ Chapter 7 Noise;
 - ▶ Chapter 8 Shadow Flicker;
 - ▶ Chapter 9 Landscape and Visual Impact;
 - ▶ Chapter 10 Historic Environment (includes archaeology);
 - ▶ Chapter 11 Ecology;

- ▶ Chapter 12 Ornithology;
- ▶ Chapter 13 Geology, Hydrology and Hydrogeology;
- ▶ Chapter 14 Traffic and Transport;
- ▶ Chapter 15 Socio-economics;
- ▶ Chapter 16 Infrastructure, Telecommunications and Safety; and
- ▶ Chapter 17 Aviation.

1.2.6 Chapter 18 summarises any changes to the mitigation measures proposed and presents the residual effects for the Proposed Development.

1.3 Enoch Hill Wind Farm – Revised Layout

1.3.1 The Proposed Development is to construct and operate a wind farm of up to 16 turbines and associated infrastructure including a new vehicular access from the B741, access tracks, up to two permanent meteorological masts, borrow pit(s) located within two borrow pit search areas, temporary works (e.g. construction compounds) and on-site electrical infrastructure including a wind farm control building and a Scottish Power Energy Networks (SPEN) 132/33kV substation and underground cabling connecting the electrical infrastructure.

1.3.2 The revisions to the Proposed Development are as follows:

- ▶ A reduction in the number of turbines (and associated infrastructure such as crane pads) from up to 19 to up to 16;
- ▶ A reduction in the length of access tracks from ~12.9km to ~12.07km;
- ▶ A reduction in the number of watercourse crossings from six to five;
- ▶ A reduction in the number of borrow pit search areas from three to two;
- ▶ An increase in the generation capacity of each turbine from up to 3.3MW to up to 3.4MW; and
- ▶ A reduction in the land take from ~14.23ha to ~13.06ha.

1.3.3 The Revised Layout is shown on **Figure 1.1**. For comparative purposes, the Original Layout and the Revised Layout are both shown on **Figure 1.2**. As stated in ES, it is assumed that the Proposed Development will be decommissioned after 25 years of operation for the purposes of this assessment.

1.3.4 The installed capacity of the Proposed Development is anticipated to be up to 54.4MW based on the potential use of 16 turbines each with an electrical rated output of up to 3.4MW. Taking into account that the turbines will not operate at full capacity all of the time, the potential amount of electricity produced by the Proposed Development has been estimated to be in the order of 156,878MWh per year, which will be equivalent to the approximate domestic needs of approximately 42,251 domestic homes in East Ayrshire and based on an expected site specific capacity factor of 32.92%. This figure has been derived from over two years of wind monitoring undertaken by the two temporary anemometer masts installed at the Development Site and is substantially greater than the average Scottish capacity factor of 27%². Further details of the derivation of these figures and the assumptions made are provided in Section 6.3 of FEI **Chapter 6 - Renewable Energy Policy, Carbon Balance and Peat Management**.

² This is the long term average load factor figure for Scotland published by Department of Energy and Climate Change (DECC), Energy Trends Section 6: Renewables (ET6.1 Renewable Electricity Capacity and Generation, July 2016). Capacity factor for Scotland - 27%.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/437811/et6_1.xls

1.4 The Project Team

The project team is the same as for the EIA reported in the ES with the exception of three members of staff who have since left Amec Foster Wheeler as outlined below:

- ▶ Landscape and Visual Impact (FEI **Chapter 9**) – Emma Jinks MA, PgD, PgC has been replaced by Jon Rowe CMLI PgDip;
- ▶ Ecology (FEI **Chapter 11**) Rachel Finan B.Sc. (Hons), MSc has been replaced by Anita Hogan B.Sc. (Hons), MSc; and
- ▶ Geology, Hydrology and Hydrogeology (FEI **Chapter 13**) – Eleanor Haresign B.Sc. (Hons), PGDip, Ph.D. has been replaced by Heather Williams B.Sc. (Hons), MSc, Ph.D.

1.5 References

Department of Energy and Climate Change (DECC), (2015) Energy Trends Section 6: Renewables (ET6.1 Renewable Electricity Capacity and Generation).

Enoch Hill Wind Farm Environmental Statement (2015), Amec Foster Wheeler.

The Scottish Government. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

The Scottish Government. Town and Country Planning (Scotland) Act 1997.

2. EIA Process

2.1 Overview of EIA

2.1.1 The EIA process described in Enoch Hill Wind Farm Environmental Statement (referred to throughout as 'the ES'), remains unchanged during the intervening period between that and the production of this FEI. **Chapter 2** of the ES should therefore be referred to.

2.2 EIA Methodology

2.2.1 Refer to **Chapter 2** of the ES.

2.3 Scope of the EIA

2.3.1 Refer to **Chapter 2** of the ES for information in relation to the scoping process, scoping opinion, further scope evolution and consideration of alternatives.

2.3.2 Consultation responses received relating to the ES are provided in Table 2.1. This table is followed by updated information in respect of wind farm developments assessed for potential cumulative impacts (i.e. reflecting the position at the time of writing this FEI).

ES Consultation Responses

2.3.3 Table 2.1 below provides a summary of the consultation responses which were received in relation to the ES and describes how the observations noted in these have been addressed in this FEI document.

Table 2.1 ES consultation Responses

Consultee	Summary of Consultation Letter	Response
Ayrshire Roads Alliance Flooding Department (27/10/15)	No objection. State that as long as no development takes place within the indicative 1:200 year flood outlines, it has no further comments.	Comments noted.
British Horse Society (BHS) (27/10/2015)	No objection. Attach BHS wind farm guidance for developers and planning authorities.	Comments noted.
BT (09/10/2015)	No objection. State that the Proposed Development should not cause interference to BT's current and presently planned radio networks.	Comments noted.
Civil Aviation Authority (CAA) (23/10/2015)	No objection. State that the appropriate aviation consultees have been identified and should be consulted. State that an aeronautical chart should be checked to see if the Development Site falls within the range of an aerodrome using the distances recommended in CAP 764. Recommend that Emergency Service Helicopter Support Units are consulted. Provide a list of the information that should be notified to the Defence Geographic Centre. State that there is no CAA requirement for the turbines to be lit.	Comments noted and response included in Chapter 17 (Aviation) .

Consultee	Summary of Consultation Letter	Response
<p>Carsphairn Community Council (06/11/2015)</p>	<p>Comment on potential cumulative Landscape and Visual impacts as well as visual impacts on Carsphairn, impacts on house prices, attractiveness to visitors and the historic landscape and environment. Welcome the increased public access to the site as a result of the Proposed Development.</p>	<p>Comments noted. See Chapters 9, 15 and 10 respectively for clarifications in relation to potential Landscape and Visual, Socio-Economic and Tourism and Cultural Heritage impacts.</p>
<p>CH2MHILL (Peat) (11/11/2015)</p>	<p>No objection. Suggest additional information which could be included in Peat Slide Risk Assessment.</p>	<p>Comments noted. A revised Peat Slide Risk Assessment is presented as Appendix 6.B.</p>
<p>The Crown Estate (06/11/2015)</p>	<p>No objection. State that the Proposed Development lies within an area over which it has granted a mine royal option agreement, but that the assets of the Crown Estate are not affected by the Proposed Development.</p>	<p>Comments noted.</p>
<p>Dumfries and Galloway Council Roads Planning Team (03/11/2015)</p>	<p>No objection. State that both Abnormal Loads and general construction traffic will utilise roads within Ayrshire but that if this changes, the developer should consult Dumfries and Galloway Council Roads Planning Team.</p>	<p>Comments noted.</p>
<p>Defence Infrastructure Organisation (DIO) (20/11/2015)</p>	<p>No objection. Request that the proposed turbines and anemometry masts are fitted with aviation safety lighting and provide information on the specification of these. Give details of information which should be provided to the Defence Geographic Centre and DIO if the Proposed Development was granted consent.</p>	<p>Comments noted.</p>
<p>East Ayrshire Council (EAC) Countryside Access Officer (04/11/2015)</p>	<p>No objection. State that no formal linear access routes, either Public Rights of Way (PROW) or Core Paths, exist within the Development Site, but that a PROW exists from Dallegles to the northern boundary of the Development Site, which would not be impacted by the Proposed Development. Provide figures showing PROW around the Development Site. State that area wide access rights would be suspended during construction activities and reinstated automatically post construction. State that If the application is approved then adherence to "Good practice during wind farm construction, 2nd Edition 2013, Part 7 Recreation and Access" should be a condition of approval and provide reasoning for this.</p>	<p>Comments noted and responses included in Chapters 9 and 15 (Landscape and Visual and Socio-Economic and Tourism respectively).</p>
<p>EAC Senior Planning Officer in relation to noise (31/03/16)</p>	<p>An email was received from David Wilson Senior Planning Officer at EAC supplying a review of the noise assessment (ES Chapter 7) which was undertaken by ACCON UK Ltd. The email</p>	<p>Comments noted and response included in Chapter 7 (Noise).</p>

Consultee	Summary of Consultation Letter	Response
	contained some queries about the noise limits which had been proposed in the noise assessment.	
EAC Roads Department (22/11/15)	No objection. State that the Ayrshire Roads Alliance would require section 96 and 69 agreements to be entered into and would consider a contribution in the order of £1.00 per tonne to be appropriate. State that the applicant will be required to obtain a section 56 road opening permit for the new site access junction on the B741 to ensure that the appropriate construction specification is carried out.	Comments noted and response included in Chapter 14 (Traffic & Transport).
Galloway Fisheries Trust (20/11/15)	No objection. State that it is also commenting on behalf of the Kirkcudbrightshire Dee District Salmon Fishery Board, upon whose jurisdictional area a small part of the Proposed Development lies. State a route of pollution into the Dee catchment exists during the construction of turbines 6, 7 and 19, and the associated access routes. Appreciate the buffer zone of 50m to be applied around all watercourses in the area and suggest that this is an absolute minimum. Request that turbines 6, 7 and 19 are re-positioned with a buffer of 100m to the nearest watercourse. Would like to have the opportunity to agree a pre-construction, during construction and post-construction monitoring programme.	Comments noted and response included in Chapter 13 (Geology, Hydrology and Hydrogeology).
Glasgow Prestwick Airport (GPA) (27/10/15 and 21/09/2016)	No objection. The initial objection to the Proposed Development on the basis that all proposed turbines would be detected by their primary surveillance radar was later withdrawn on the basis that planning conditions relating to a radar mitigation scheme would be implemented.	Comments noted and response included in Chapter 17 (Aviation).
Historic Environment Scotland (27/10/15)	No objection. Recommend that further advice is sought from the West of Scotland Archaeology Service. Do not consider that the potential impacts upon heritage assets within their statutory remit are of a level of significance to warrant an objection. Broadly agree with the conclusions of the ES. Make some minor comments about the clarity of information provided and stated that a wireframe visualisation from the northern part of Craigen Gillan GDL around the Dalnean Hill Scheduled Monument and greater cross-referencing between the Historic Environment and LVIA chapters would have been useful.	Comments noted and response included in Chapter 10 (Historic Environment).
Ironside Farrar (on behalf of East Ayrshire Council) January 2016	Provide a comprehensive review of the Landscape and Visual Impact Assessment (ES Chapter 9). See Chapter 9 of this FEI for more detail.	Comments noted and response included in Chapter 9 (Historic Environment).

Consultee	Summary of Consultation Letter	Response
<p>Marine Scotland Science (MSS) (05/11/15)</p>	<p>No objection. Welcome the avoidance of construction at water course crossings during the sensitive spawning periods for salmonids (between January and May); however recommend construction activity to also avoid the migratory period prior to spawning, from October to January. Provide a document outlining a full description of an integrated monitoring programme. Welcome the proposal to appoint an Ecological Clerk of Works. Given the importance of salmonid populations within the River Nith catchment and the international importance of salmon populations, MSS considers that there is insufficient information in the ES regarding site characterisation data for water quality and fish populations.</p>	<p>Comments noted and response included in Chapter 11 (Ecology) and Chapter 13 (Geology, Hydrology and Hydrogeology).</p>
<p>NATS Safeguarding (29/09/15)</p>	<p>Object to the Proposed Development as a result of potential impacts on Lowther Hill Radar. It is predicted that there is potential for false primary plots to be generated by the proposed turbines which could cause a reduction in the radar's probability of detection of aircraft.</p>	<p>Comments noted and response included in Chapter 17 (Aviation).</p>
<p>Nith District Salmon Fishery Board (NDSFB) (06/10/15)</p>	<p>No objection. NDSFB are confident that the fisheries information gained is sufficient to establish a baseline position to enable it to determine if any impacts are created as a result of this project which result in an influence within the fish community. Do not have any concerns with regards to potentially significant effects.</p>	<p>Comments noted.</p>
<p>RSPB Scotland (11/11/15)</p>	<p>No objection. Raise concerns in relation to indirect impacts on blanket bog habitat, impacts on non-breeding populations of golden plover and impacts on black grouse. Recommend suitable planning conditions to:</p> <ol style="list-style-type: none"> 1) Implement a programme of post construction bird monitoring to be agreed with SNH and RSPB; and 2) Lead to a suitable habitat management plan being submitted a minimum of three months prior to commencement of development. <p>State that an escrow deposit for aftercare would be a lower risk option than a bond or bank guarantee.</p>	<p>Comments noted and response included in Chapter 12 (Ornithology).</p>
<p>Scottish Water (SW) (02/11/15)</p>	<p>No objection. State that the Proposed Development is within the catchment for the Carsfad reservoir which is located approximately 30km south of the Development Site and is an emergency source of drinking water. SW also abstract from four boreholes located a considerable distance downstream in the River</p>	<p>Comments noted and response included in Chapter 13 (Geology, Hydrology and Hydrogeology).</p>

Consultee	Summary of Consultation Letter	Response
	<p>Nith catchment; and it requests to be notified of any pollution events that would affect Carsfad reservoir and these receptors.</p>	
<p>Scottish Rights of Way and Access Society (Scotways) (11/11/15)</p>	<p>No objection. State that the National Catalogue of Rights of Way does not show any rights of way which would be affected by the Proposed Development, but that there may be unrecorded routes. Concerned that recorded rights of way within 10km appear not to have been considered.</p>	<p>Comments noted and response included in Chapter 9 (Landscape & Visual).</p>
<p>SEPA (10/11/15)</p>	<p>Objection on the grounds of lack of information in relation to the disturbance and re-use of excavated peat. Objection on the grounds of lack of information in relation to borrow pits.</p> <p>Acknowledge the intention to prepare a Construction Environmental Management Plan (CEMP), inclusive of a Pollution Prevention Plan (PPP), Site Waste Management Plan (SWMP) and Construction Method Statement (CMS), and state that a condition should be attached to any planning consent such that a site specific CEMP is submitted, along with relevant PPP, SWMP and CMS, for approval to the determining authority.</p> <p>State that direct impacts on the three habitats identified in the ES as being groundwater dependent will be adequately mitigated by the measures presented in the GWDTE assessment.</p>	<p>Comments noted and responses provided in Chapters 4, 6, 13 (Project Description; Renewable Energy Policy, Carbon Balance and Peat and Geology, Hydrology and Hydrogeology respectively).</p> <p>The turbines which have been removed from the Original Layout (15, 16 and 18) were all located on peat deeper than 1m, As a result there is a ~25% reduction in the predicted volume of peat that will need to be excavated compared with the Original Layout. A revised Peat management plan with more detail on this is provided as Appendix 6.B.</p> <p>More information in relation to borrow pits is provided in a borrow pit assessment provided in Appendix 4.A.</p>

Consultee	Summary of Consultation Letter	Response
<p>SNH (04/12/15)</p>	<p>No Objection. Advise that Enoch Hill Wind Farm would be likely to result in significant cumulative landscape and visual impacts. Comments also provided in relation to effects on bats, water voles, birds, deer and decommissioning.</p>	<p>Comments noted and responses provided in Chapters 4, 6, 9, 13 (Project Description; Renewable Energy Policy, Carbon Balance and Peat and Geology, LVIA Hydrology and Hydrogeology respectively).</p> <p>The following changes were made to the Original Layout to address consultee concerns:</p> <ul style="list-style-type: none"> ▶ The number of turbines was reduced from up to 19 to up to 16; ▶ An outlying turbine of concern to the above consultees in VP 4 and VP5 (turbine 16) was removed; ▶ Turbines 3 and 4 were moved from their summit locations; and ▶ Turbine 13 was moved further downhill.
<p>Transport Scotland (13/11/15)</p>	<p>No Objection and confirm it is satisfied with the ES. Provide the details of the route managers for discussions in relation to any impacts on trunk roads. Agree that the increase in HGV movements on the A76(T) would not be significant and that in line with IEMA guidelines, no further assessment of environmental impacts is necessary. Agree that there would be no significant effects on trunk roads in terms of noise or air quality. Propose two planning conditions in relation to approval of the abnormal load route and signage</p>	<p>Comments noted and response included in Chapter 14 (Traffic & Transport).</p>

Cumulative Effects

2.3.4 **Chapter 9** of the ES included a cumulative landscape and visual impact assessment (CLVIA) based on the identification (as at April 2015) of wind energy developments within a 70km Search Area from the Development Site. In line with SNH guidance (Assessing the Cumulative Impacts of Onshore Wind Energy [March 2012]), the CLVIA considered the potential for cumulative effects with other operational, consented and planning application stage wind farm developments within a 35km Study Area from the Development Site, as detailed in Table 9.4 of the ES.

- 2.3.5 To account for potential changes to cumulative wind energy development within this 35km Study Area, an updated cumulative search was undertaken in August 2016 using data available from relevant planning authority websites.
- 2.3.6 Wind farm sites included in ES Table 9.4 but which are no longer of relevance for the updated cumulative impact assessment are listed in Table 2.2.

Table 2.2 Cumulative Wind Energy Developments (from ES Table 9.4) Removed from Updated CLVIA

ES Ref	Name	No. of Turbines	BT Height	Distance (km) from Enoch Hill ES layout ¹	Reason for Removal
A05	High Cumnock	8	132	9.42	Appeal Dismissed
A08	Quantans Hill	19	130	11.79	Withdrawn
A09	Glenmount	19	130	12.00	Withdrawn
A14	Longburn	20	135	15.76	Withdrawn (revised scheme submitted)
A16	Spango	14	145	20.11	Refused
A22	Loch Urr	26	127.5	28.15	Withdrawn
A23	Leadhills (Windy Dod)	14	137	30.47	Refused
A26	Burnfoot Farm	1	77	32.03	Withdrawn
S28	Coldwakening	1	79	32.09	Consented turbine height now <50m so excluded from CLVIA
S34	Bloomsfield Farm	1	51	34.23	No Data Available

- 2.3.7 The sites considered for inclusion in the updated CLVIA undertaken in FEI Chapter 9 are identified in Table 2.3 (as of August 2016). Table 2.3 includes pre-application sites, although following SNH guidance these have been excluded from the updated CLVIA. All new sites are italicised for ease of identification.

Table 2.3 Cumulative Wind Energy Developments (as at 12th August 2016)

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
Existing						
E01	E01	Windy Standard	36	92.5	5.0	No known change
E02	E02	High Park Farm	1	75	6.0	No known change
E03	E03	Hare Hill	20	63.5	8.5	No known change
E04	E04	Wether Hill	14	91	18.0	No known change

¹ As measured from the nearest turbine of the original Enoch Hill ES layout to the site centre of other schemes.

² The original status of each site is detailed within Table 9.4 of the ES.

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
E05	E05	Sunnyside	2	62	19.5	Progressed from consented to Existing
E06	E06	Bankend Rig	11	76	26.5	No known change
E07	E07	Dungavel	13	100-120	30.5	Progressed from Consented to Existing
E08	E08	Nutberry	6	125	30.5	No known change
E09	E09	Hagshaw Hill	26	55	30.5	No known change
E10	E10	Hadyard Hill	52	100	30.5	No known change
E11	E11	Low Bowhill	1	67	31.5	No known change
E12	E12	Hagshaw Hill Extension	20	80	32.0	No known change
E13	E13	Calder Water (Hareshaw Hill)	14	144.5	32.5	No known change – turbine dimensions corrected
E14	E14	Whitelee Extension (Phase I + II)	75	140	35.0 ³	No known change
E15	E15	Shewalton Moss / Glaxo	4	110	35.0 ⁴	No known change
E16	E16	West Browncastle	12	126.5	35.5 ⁵	No known change
E17	E17	Whitelee	140	110	37.5 ⁶	No known change
Consented (including sites where enabling works [have or are being carried out] or under construction but not operational)⁷						
C01	C01	Windy Standard Extension (Brockloch Rig)	30	100-120	5.5	No known change
C02	C02	Afton	27	120	5.5	No known change
C03	C03	Taiglim Farm	1	34.2	8.5	Progressed from application to consented
C04	C04	Hare Hill Extension	39	96	9.0	No known change

³ Whilst the centre of this site is located outwith 35km from the nearest proposed turbine, some of the turbines are located within 35km.

⁴ Whilst the site centre is located outwith 35km from the nearest proposed turbine, some of the turbines are located within 35km.

⁵ Whilst the site centre is located outwith 35km from the nearest proposed turbine, some of the turbines are located within 35km.

⁶ Whilst the site centre is located outwith 35km from the nearest proposed turbine, some of the turbines are located within 35km.

⁷ Based on developer sources as planning authorities do not routinely publish documents confirming whether developments have commenced or been completed.

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
C05	C05	Mansfield Mains	1	44.85	9.0	No known change
C06	C06	Sanquhar 'Six'	6	130	10.5	Progressed from scoping to consented
C07	C07	Sanquhar	12	130	12.5	No known change
C08	C08	Dersalloch	23	125	14.0	No known status change - under construction
C09	C09	Whiteside Hill	11	121.2	14.5	No known change
C10	C10	Glenmuckloch	8	133.5	15.00	Progressed from scoping to consented
C11	C11	Torrs Hill	2	100	17.5	No known change
C12	C12	Penbreck (6T in SLC)	9 (6 in SLC)	125	2100	No known change (3T in EAC still at application stage)
C13	C13	Twentysilling Hill	9	125	21.5	Now under construction
C14	C14	Linburn Farm	2	67	24.5	Progressed from application to consented
C15	C15	Knockman Hill	5	81	25.0	No known change
C16	C16	Kennoxhead	26	126.5	26.0	Progressed from application to consented
C17	C17	Blackcraig Hill	23	110	27.0	–Now under construction
C18	C18	Galawhistle	22	110.2 (18T) - 121.2 (4T)	30.0	No status change - under construction
C19	C19	<i>Stoneyhill Farm</i>	<i>1</i>	<i>100</i>	<i>30.0</i>	<i>Consented</i>
C20	C20	Andershaw	14	140	30.5	No known status change - under construction with updated turbine dimensions
C21	C21	Cumberhead Wind Farm (Nutmerry Extension)	16	126.5	30.65	Progressed from scoping to consented
C22	C22	<i>Kype Muir Extension</i>	<i>18</i>	<i>132 / 152</i>	<i>31.5</i>	<i>Consented</i>
C23	C23	Chapelton Farm	3	67	31.5	No known change
C24	C24	Hazelside Farm	2	74	33.0	No known change
C25	C25	Middle Muir	15	136 (8T) & 152 (7T)	33.0	No known status change. Maximum height remains

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
						unchanged but hub height and rotor diameter ranges have been amended.
C26	C26	Hallburn Farm	1	77	33.5	Consented
C27	C27	Dalquhandy	15	126.5	33.5	No known change
C28	C28	Kype Muir	26	132	34.0	No known change
C29	C29	Sneddon Law	15	130	34.0	No known change
C30	C30	Mochrum Fell	11	126.5	35.0	Progressed from application to consented (following Appeal)
C31	C31	Cleughhead Farm	1	79	35.0	No known change
C32	C32	Yonderton Farm	1	51	35.0	No known change
C33	C33	Dowhill	1	77	35.5	No known change
C34	C34	Netherholm Farm	1	51	35.5	No known change
C35	C35	Auchrobert	12	132	35.5	No known status change - under construction
In Planning						
A01	A01	South Kyle	50	149.5	3.0	Awaiting Ministerial Determination
A02	A02	Pencloe	19	125	3.0	No known status change - layout reduced to 19 turbines
A03	A03	Benbrack	18	130	6.0	No known change - PLI decision awaited
A04	A04	Windy Rig	16	125	8.0	Progressed from scoping to application
A05	A05	Polquhairn	9	100	10.5	No known status change - pending consideration
A06	A06	Garleffan	6	135.5	10.5	No known status change - pending consideration. Reduced to 6 turbines
A07	A07	Lorg	15	149.5 (11T at 130)	11.5	Progressed from scoping to application
A08	A08	Sandy Knowe (revised scheme)	24	125	12.0	New application (revised scheme)

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
A09	A09	Knockshinnoch	2	126.5	13.50	EAC minded to grant planning permission subject to a legal agreement
A10	A10	High Glenmuir	1	62	14.0	No known change - pending consideration
A11	A11	Lethans	22	7T - 136, 10T - 152, 5T - 176	15.0	No known status change - reduced to 22 turbines with amended heights
A12	A12	<i>Longburn (revised scheme)</i>	10	134	15.5	<i>New application (revised scheme reduced from previous scheme of 20 turbines)</i>
A13	A13	Keirs Hill	17	149	16.0	No known change – PLI complete, awaiting Ministerial Determination
A14	A14	Ulzieside	12	125	16.5	No known change - pending consideration
A15	A15	Wether Hill Extension	11	100	17.5	Progressed from scoping to application
A16	A16	Linfairn	17	126.5	19.5	Progressed from scoping to application (at PLI)
A17	A17	Knockskae	11	126	20.5	Progressed from scoping to application
A18	A18	Penbreck (3T in EAC)	9 (6 in SLC, 3 in EAC)	125	21.0	Pending determination
A19	A19	Fowler Farm	1	67	21.0	No known change - at Local Review Body
A20	A20	Margree	17	120	23.0	Pending consideration with amended turbine dimensions
A21	A21	<i>Loch Hill (revised scheme)</i>	8	126.5	24.0	<i>New application (revised scheme)</i>
A22	A22	Bankend Rig II (Bankend Rig Extension)	3	136	26.5	Progressed from scoping to application
A23	A23	<i>Hadyard Hill Extension</i>	31	126.5	26.5	<i>New application</i>

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
A24	A24	Glentagart	5	132	31.5	No known change - pending consideration
A25	A25	Feoch	1	67	32.0	No known change - pending consideration
A26	A26	Alton Muirhouse Farm	2	130	33.0	Progressed from scoping to application
A27	A27	Balunton Hill	9	126	33.0	Progressed from scoping to application
A28	A28	Douglas West	15	126.5	34.5	Progressed from scoping to application
Pre-Application Sites (In accordance with the SNH guidance, projects at the scoping stage have not be included in the CLVIA)						
S01	S01	Monquhill	5	150	1.22	No known change
S02	S02	Land At Burnfoot	1	67	3.80	No known change
S04	S03	Windy Standard Phase III	25	120-150	6.14	No known change
S03	S04	High Park Farm II	2	74	6.38	No known change
S05	S05	Euchanhead	31	145	7.23	No known change
S07	S06	Greenfield Farm	1	36.6	8.16	No known change
N/A	S07	<i>Sanquhar II</i>	20	160	9.02	<i>Additional site</i>
S10	S08	Knockower Community	16	145	12.34	No known change
N/A	S09	<i>Quantans Hill (revised scheme)</i>	12	N/A	12.83	<i>New (revised scheme)</i>
S12	S10	Shepherds Rig	45	146.5	13.43	No known change
N/A	S11	<i>Millrigg</i>	8	149	13.47	<i>Additional site</i>
N/A	S12	Knocknalling	14	150	18.82	<i>Additional site</i>
S15	S13	Auchenlongford	5	N/A	20.50	No known change
N/A	S14	<i>Stroanshalloch</i>	16	146.5	20.67	<i>Additional site</i>
N/A	S15	<i>Burnfoot Moor</i>	3	69.5	21.74	<i>Additional site</i>
S18	S16	Hawkleuchside (II)	5	84	24.01	No known change
S19	S17	Hawkleuchside (I)	3	84	24.17	No known change
N/A	S18	<i>North Lowther</i>	42	150	26.41	<i>Additional site</i>
S21	S19	Loanfoot Farm	1	76.5	27.52	No known change

ES Ref	FEI Ref	Name	Turbine No.	Max. height to blade tip (m)	Distance (km) from Enoch Hill ES layout ¹	Status Changes (April 2014 to August 2016) ²
S22	S20	Knoweside	8	132	29.32	No known change
S23	S21	Kirk Hill	8	126.5	29.43	No known change
S24	S22	East Head Steadings	1	77	30.79	No known change
S25	S23	High Bowhill Farm	1	77	31.85	No known change
S29	S24	Barlay Hill	10	N/A	32.55	No known change
S30	S25	Marnhoul	16	146.5	32.74	No known change
S31	S26	Collieston Hill	18	N/A	33.47	No known change
S35	S27	Lambdoughty	N/A	N/A	34.96	No known change

2.4 Community Engagement

2.4.1 E.ON considers community consultation and engagement key to their development and design process, and the extensive range of consultation activities which were undertaken are reported in **Chapter 2** of the ES.

2.5 References

Refer to **Chapter 2** of the ES.

Scottish Natural Heritage, Guidance: Assessing the Cumulative Impacts of Onshore Wind Energy (March 2012).



3. Site Selection and Design Evolution

3.1 Site Identification Process

3.1.1 Refer to **Chapter 3** of the ES.

3.2 Site Context

3.2.1 Refer to **Chapter 3** of the ES.

3.3 Design Evolution

3.3.1 The information describing how consultation comments have been taken account of in the design outlined in Sections 3.3.1 and 3.3.2 of **Chapter 3** of the ES remains valid.

Site Design Iterations

3.3.2 **Table 3.1** summarises the main further design alterations which have reduced potential environmental effects in response to consultation comments received in relation to the section 36 application. The design iterations presented in Table 3.1 start at Layout 8 which was the Original Layout submitted with the section 36 application. Information in respect of previous design iterations (Layouts 1 to 7) is given in Table 3.1 of **Chapter 3** of the ES.

Table 3.1 Design Iterations

Design Iteration	Constraints Influencing Layout	Summary of Change
Layout 8 (Original Layout)	<p>Minor tweaks to Layout 7 resulted in a 19 turbine design freeze layout being produced in March 2015, which was submitted with the section 36 application in September 2015.</p> <p>T7 was relocated slightly to remove line of sight with Great Dun Fell Radar Station.</p> <p>The borrow pit search area near Peat Hill was reduced in size by ~50% to minimise effects on black grouse.</p> <p>Tracks linking T3 to T5 and T17 were realigned to pass between or around areas of eroded peat faces.</p>	<p>Location of one turbine moved slightly.</p> <p>Borrow pit search area near Peat Hill resized, some tracks realigned.</p> <p>A 19 turbine layout as shown on ES Figure 3.1 resulted.</p>
Layout 9 (Revised Layout)	<p>In response to comments received from East Ayrshire Council (through an audit prepared by their consultants Ironside Farrar) and Scottish Natural Heritage (SNH) expressing concern at the composition of the Original Layout from VP 4 (New Cumnock Cemetery) and VP 5 (Highpoint north of site [near Auchinross]), the following changes were made to the Original Layout:</p> <ul style="list-style-type: none"> ▶ The number of turbines was reduced from up to 19 to up to 16; ▶ An outlying turbine of concern to the above consultees in VP 4 and VP5 (turbine 16) was removed; ▶ Turbines 3 and 4 were moved from their summit locations; and ▶ Turbine 13 was moved further downhill. <p>The Revised Layout took account of the environmental and technical constraints that informed the development of Layouts 1-8.</p> <p>The turbines which were removed (15, 16 and 18) were all located on peat deeper than 1m. As a result there is a ~25% reduction in the predicted volume of peat that will need to be excavated compared with the Original Layout.</p>	<p>Turbines 15, 16 and 18 removed.</p> <p>Location of 12 turbines moved by up to ~400 m and some tracks removed or realigned in response to changes in turbine position. Watercourse crossings reduced in number from six to five.</p> <p>The most southerly borrow pit search area removed.</p> <p>A 16 turbine layout as shown on FEI Figure 1.1 resulted.</p>

Design Iteration	Constraints Influencing Layout	Summary of Change
	<p>In their consultation response, the Scottish Environment Protection Agency (SEPA) suggested relocation of the proposed substation and construction compound to the opposite site of the access track. Further peat probing found that peat depths are similar on both sides of the access track, so the location has not changed in the Revised Layout.</p> <p>In addition, due to the need for less construction material and to reduce environmental effects (although these had been assessed as non significant and were not a concern to consultees) the southernmost borrow pit search area was removed from the Revised Layout.</p> <p>Access tracks were removed or realigned where appropriate and this has resulted in a reduction of track length by ~800 m and the number of watercourse crossings being reduced from six to five.</p>	

3.3.3

Full details of development constraints can be found in the technical chapters of the ES.

4. Description of the Proposed Development

4.1 Introduction

- 4.1.1 This chapter provides a description of the Development Site and the Proposed Development, which will include wind turbines, crane pads, access tracks, wind farm control building, Scottish Power Energy Networks (SPEN) substation¹, two permanent anemometer masts, borrow pits (within search areas) and a temporary construction compound.
- 4.1.2 The revisions to the Proposed Development for which the section 36 application was submitted in September 2015 are as follows:
- ▶ A reduction in the number of turbines (and associated infrastructure such as crane pads) from up to 19 turbines, to up to 16 turbines;
 - ▶ An increase in the maximum electrical rated output of each turbine from up to 3.3MW to up to 3.4MW;
 - ▶ A reduction in the length of access tracks from ~12.9km to ~12.07km;
 - ▶ A reduction in the number of watercourse crossings from six to five;
 - ▶ A reduction in the number of borrow pit search areas from three to two; and
 - ▶ A reduction in the permanent land take (i.e. during operation) from ~14.23ha to ~13.06ha.
- 4.1.3 The Proposed Development (shown on **Figure 1.1**) is located in East Ayrshire approximately 6km to the south west of New Cumnock and approximately 7km to the north east of Dalmellington, close to the northern border of Dumfries and Galloway Council (DGC). The B741 runs in an east - west direction along the northern part of the Development Site, connecting the aforementioned settlements of Dalmellington and New Cumnock. Carsphairn Forest is located to the west and south of the Development Site boundary, with open cast mining to the north and open moorland to the east.
- 4.1.4 The elevation of the Development Site is between 210m – 569m above ordnance datum (AOD) and covers an area of approximately 1,466ha, the majority of which is rough grazing land. The topography of the Development Site is characterised by five summits; Peat Hill, Rigg Hill, Enoch Hill, Chang Hill and Benty Cowan Hill. The highest of these is Enoch Hill at 569m above ordnance datum (AOD).

4.2 Development & Design Layout

- 4.2.1 **Table 4.1** provides a summary of the key features of the Proposed Development, with the design layout as described in the following sections shown in **Figure 1.1**.

¹ This substation will be operated and built by SPEN and planning consent is sought with this application with the understanding that the final footprint position within this compound and the ground floor plans and elevation plans of the SPEN substation will be submitted for approval in accordance with the consent's planning conditions should approval be granted.

Table 4.1 Key Development Features

Component	Description
Wind Turbines	Number: up to 16 (see Table 4.2 for grid references) Model: see Section 4.2.8 Maximum Rated Output per turbine: up to 3.4 MW Turbine Height (to tip): up to 130m (Hub height: up to 80m & Blade Length: up to 53m) ²
Turbine Foundations	Number: up to 16 Footprint per Turbine: ~0.05ha based on 25m diameter foundation Foundation Depth: 2-3m dependent on ground conditions.
Turbine Crane Pads	Number: up to 16 Dimensions: 25m by 50m Footprint per Crane Pad: ~ 0.125ha
Permanent Anemometer Masts	Maximum number: 2 (located at National Grid Reference (NGR) E 255533, N 607642 and E 256259, N 606618) Description: up to 80m high permanent wind monitoring mast (x2) Crane Pads: 20m x 20m each
Wind Farm Control Building and Compound & SPEN Substation and Compound	Location: Approximately centred on NGR E 255430, N 608980, Dimensions: 180m by 110m Control Building Height: up to 5.5m Maximum Compound Footprint: 1.98ha
Access Tracks (including turning heads)	Length: ~12.07km / Running Width: up to 6m (wider on bends, see Sections 4.2.13 to 4.2.16 for more details) Footprint: Approximately 7.8 ha
Watercourse Crossings	Up to 5 culverts
Passing Places (24 no.)	Number: estimated 24 Dimensions: 30m in length, up to 5m wide Footprint: Approximately 0.36ha
Borrow Pits	Total number: up to 2
Temporary Construction Compound	Location: centred on NGR E 255405, N 609120. Dimensions: ~ 100m by 100m Footprint: ~1.0ha
Cable Trenches	Depth: 1m / Width: 1.2m Cables will be installed in areas along access tracks

Turbine Layout

4.2.2 The Revised Layout of the Proposed Development, which has taken account of the findings of environmental and engineering studies, including desktop studies, field visits, peat depth surveys, planning designations and wind yield analysis (as noted in ES **Chapter 3: Site Selection and Design Evolution**, with any changes identified in FEI **Chapter 3**), is shown on **Figure 1.1**. The turbine locations, along with the location of the permanent on-site anemometry masts, are presented in **Table 4.2**. Note that turbines 15, 16 and 18 of the previous layout have been dropped, with turbines 17 and 19 of the Original Layout renumbered to ensure a logical numbering system as outlined in **Table 4.2**.

Table 4.2 Wind Turbine and Permanent Anemometry Mast Locations

Component	Location (NGR)
Turbine 1	E 255563, N 607866
Turbine 2	E 255934, N 608200
Turbine 3	E 255716, N 607356
Turbine 4	E 256142, N 606876
Turbine 5	E 256373, N 608072

Component	Location (NGR)
Turbine 6	E 256490 N 607097
Turbine 7	E 256621, N 606524
Turbine 8	E 256651, N 607737
Turbine 9	E 256920, N 607348
Turbine 10	E 257209, N 607066
Turbine 11	E 257160, N 607685
Turbine 12	E 257360, N 606678
Turbine 13	E 257491, N 607348
Turbine 14	E 257659, N 608057
Turbine 15	E 256028, N 607726
Turbine 16	E 256400, N 606200
Anemometry Mast 1	E 255533, N 607642
Anemometry Mast 2	E 256259, N 606618

Micrositing

- 4.2.3 Micrositing refers to the precise locating of wind farm infrastructure following more detailed ground investigations that would be carried out post consent. This allows the location of infrastructure to be revised within a specified distance in response to the findings of the more detailed ground investigations that are carried out as part of the preparations for construction.
- 4.2.4 Any such repositioning will be limited so as not to involve encroachment into any environmentally or technically constrained areas. In addition, micrositing provides scope to mitigate potential geo-environmental and geotechnical constraints which may only be identified during detailed site investigation works or preparatory ground works. The following factors can potentially be addressed through carefully designed micrositing:
- ▶ Minimisation of peat disturbance;
 - ▶ Avoidance of the most sensitive habitats;
 - ▶ Minimisation of need for foundation piling; and
 - ▶ Avoidance of currently undetected archaeological remains.
- 4.2.5 Where environmental and technical constraints may fall within a micrositing area, further encroachment on such areas can be restricted in any condition attached to the grant of consent (e.g. micrositing may be restricted in a particular direction if this encroaches upon a buffer around a water course for example).
- 4.2.6 It is proposed that wind turbines and the two permanent anemometry masts will have a micrositing allowance of up to 50m, with crane pads and access tracks connecting to these being microsited accordingly (i.e. up to 50m).
- 4.2.7 A micro-siting allowance of up to 25m is proposed for access tracks (including associated watercourse crossing), with the exception of any realignment necessary to connect to microsited turbines and crane pads (where the allowance may be up to 50m). These micrositing distances have been taken into account within the technical assessments.

Wind Turbine Parameters

- 4.2.8 A number of turbine models would be suitable for installation at the Proposed Development. The final choice of turbine will depend upon technical and commercial considerations, and will be decided by the Applicant following planning consent.
- 4.2.9 **Figure 4.1** shows the structure of a typical wind turbine. This is a typical modern horizontal axis, upwind design comprising four main components: a rotor (consisting of a hub and three blades), a nacelle (containing the generator and also often a gearbox) to which the rotor is mounted, a tower, and a foundation. Infra-red aviation lighting of the specification required by the MoD would be installed on each turbine and met masts. This EIA has been undertaken using the following set of maximum parameters, with which the final turbine used must comply:
- ▶ Blade Length: Up to 53m;
 - ▶ Hub Height: Up to 80m²; and
 - ▶ Tip Height: Up to 130m.
- 4.2.10 A transformer / switchgear, located within the nacelle or tower of the turbine, or immediately adjacent to it in a small kiosk (typically 5m x 3m x 3m, such that they are generally indistinct from the tower base unless viewed close up or in silhouette against the skyline at greater distances), steps up the voltage to 33kV; power from the turbines at this voltage is fed to the control building via underground electrical cabling. For the purpose of the Proposed Development it is assumed that external kiosks will be required.
- 4.2.11 The electricity generated by the Proposed Development will be metered and fed into the electricity transmission system to which it will be connected. The Proposed Development will be connected into the transmission system at 132kV and consent is also sought by the Applicant in this application for the construction of a new 132/33kV substation and compound at the Proposed Development, NGR E 255430, N 608980 including the control /switch room, as shown on **Figure 4.7**. Consent is sought for the substation with the intention that the approval of the detailed specification and layout of the substation will be subject to an appropriately worded condition attached to any grant of consent. It is noted that the maximum height of the substation will be 10m.
- 4.2.12 The turbine parameters used to inform the EIA is based on a hub height up to 80m and a tip height of up to 130m, which represents a likely development scenario. Where specific operational turbine details are required to carry out technical assessments different representative turbine models have been used to represent a worst case scenario.

On-site Access Tracks

- 4.2.13 A total of approximately 12.07km of new on-site access tracks will be constructed.
- 4.2.14 Owing to the size of some of the turbine components, all on-site access tracks will generally be up to 6m wide, with some additional localised widening required at bends in the track and for passing places to a maximum of approximately 12-14m. It is however noted that tracks are more likely to be 4.5m to 5m wide for most of their length. For the purposes of this EIA, a maximum width of 6m has been assumed. Access tracks will be constructed to a depth and quality suitable to bear the load of all envisaged traffic.
- 4.2.15 The proposed alignment of access tracks was developed initially through desk study and refined following a site visit by Civil Engineers seeking to:
- ▶ Minimise the overall track length; and
 - ▶ Avoid identified constraints (ecologically sensitive areas, areas of deep peat, waterbodies etc).

² The hub height will be adjusted to account for any blade longer than 50m to ensure that maximum tip height will not exceed 130m.

- 4.2.16 Depending on the ground conditions identified on the Development Site, a range of road construction methods may be used, for example floating roads where peat deeper than 1m has been identified as being present. Based on current knowledge of the Development Site, approximately 1,700m of floating tracks will be required. Typical road construction is illustrated in **Figure 4.2**.

Infrastructure Layout

Crane Pads

- 4.2.17 Each proposed wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to site the cranes necessary to lift the tower sections, nacelle and rotor into place. A typical crane hardstanding is shown in **Figure 4.3**.
- 4.2.18 The crane hardstandings will be left in place following construction to allow for future use of similar plant should major components need replacing during the operation of the Proposed Development. These pads could also be utilised during decommissioning. The total area of hardstanding at each turbine location will be approximately 1,250m².

Temporary Construction Compound and Laydown Area

- 4.2.19 One temporary main site compound will be constructed for the Development Site. An area measuring 100m x 100m has been allowed for the compound which will be enclosed by appropriate security fencing. A concrete batching plant will be installed either adjacent to one of the borrow pits or adjacent to the site compound, with its location to be determined following ground investigation. The final location of this batching plant would not alter the EIA findings on significant effects, taking into account the adoption of standard mitigation and best practice detailed in the Construction Environmental Management Plan (CEMP) and other relevant documents. The indicative location of the construction compound is shown on **Figure 1.1**, and a typical compound configuration is shown in **Figure 4.4**. An additional construction compound for the SPEN substation will be located either within this compound or within the compound which houses the substation and control building.
- 4.2.20 Surface vegetation and soil/peat will be removed from the area of the compound and laid on geogrid over the surrounding undisturbed vegetation until required for reinstatement during or following construction. The construction compound area will then be overlain with compacted stone to approximately 500mm depth depending on ground conditions.

Permanent Anemometry Masts

- 4.2.21 Meteorological conditions will be monitored by two permanent, free standing anemometry masts, located as shown in **Figure 1.1**, with a height of up to 80m. Each mast will be of a steel lattice type structure (an example of a steel lattice type design is shown in **Figure 4.5**), which would have an adjacent crane pad of a similar type to the turbines with dimensions 20m x 20m, and which would be left in situ for the operational period.

On-site Electrical Connections

- 4.2.22 Wind turbines generally produce electricity at 690V which is typically transformed to 33kV via the turbine transformers. As previously stated, the turbine transformer may be located inside the turbine tower, or nacelle, or it may be installed in a small external kiosk located adjacent to the turbine.
- 4.2.23 Underground cables will link the turbines to the on-site control building. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 1,000mm deep and up to 1,200mm wide. Cables will be laid in coarse sand or other granular material, and the trenches will then be backfilled with excavated soil/peat and sub-soil which has been sieved and graded to remove stones. **Figure 4.6** shows a typical cable trench detail.

- 4.2.24 To minimise ground disturbance, cables will be routed along the side of the access tracks wherever practicable. Approximately 10km of 33kV underground cable will be required on-site to connect the turbines and the control building.

Control Building and Substation

- 4.2.25 The turbines will be connected through suitable switchgear to be installed in a control building on-site. The Transmission System Operator (TSO) for the area, SPEN, will construct a 132/33kV substation which the Proposed Development will connect into adjacent to the wind farm control building. The new SPEN substation, and onsite wind farm control building will sit together within a compound with maximum dimensions of up to approximately 180m x 110m and up to two single storey buildings of approximately 30m x 20m which will house switchgear, metering, protection, control equipment, as well as welfare facilities. The final footprint position within this compound and the ground floor plans and elevation plans of the SPEN substation will be submitted for approval in accordance with planning conditions attached to any consent. The specified dimensions are conservative and the compound is likely to be reduced in size from the maximum size of up to approximately 180m x 110m once full design details for the SPEN substation are confirmed by SPEN, and these final dimensions will be submitted for approval to discharge an appropriate planning condition.
- 4.2.26 **Figure 4.7** provides an illustration of the control building and compound. Final details including external finishes and screen planting will be agreed with East Ayrshire Council (EAC). The proposed location of the control building and the main site compound are shown in **Figure 1.1**.

Operational Land Take

- 4.2.27 The total anticipated operational land take (i.e. the Proposed Development footprint post-construction) is shown in **Table 4.3**.

Table 4.3 Footprint Area by Component

Component	Area (~ha)
Tracks (including turning heads and junctions)	7.83
Passing places	0.36
Turbine Crane Pads	2
Control Building, SPEN Substation and Compounds	1.98
Turbine Bases	0.8
Met Mast foundations and crane pads	0.09
TOTAL OPERATIONAL LAND-TAKE	13.06
Temporary Construction Compound	1.0
Temporary Borrow Pits (assuming 2 in total)	4.0

Off-site Electrical Connection

- 4.2.28 SPEN will establish 1 x 90MVA 132/33kV transformer arrangement with associated switchgear in a substation located on the Development Site within the area shown in **Figure 4.7**. This will be connected by ~5km of cable, which will be underground, to the New Cumnock 132kV substation to the south-west of the Development Site. It is anticipated that cabling from the Proposed Development to the New Cumnock 132kV substation will predominantly follow the public road network. **Figure 4.8** shows the potential grid connection location.

4.3 Proposed Site Access

Site Entrance

- 4.3.1 The Development Site access will be created off the B741 that runs along its northern boundary. The new access will be located a short distance to the north east of Polmathburn Bridge, on the north western edge of the Development Site boundary and abnormal loads will not cross this bridge. The new access will be used for all phases of the Proposed Development (construction operation and decommissioning). A typical general arrangement for the new junction is shown on **Figure 4.9**.

Abnormal Loads

- 4.3.2 Due to the abnormal size and loading of wind turbine delivery vehicles, it is necessary to review the public highways that will provide access to the Development Site to ensure they are suitable, and to identify any modifications (e.g. widening) required to facilitate access for delivery vehicles.
- 4.3.3 Access studies incorporating swept path analysis (see ES **Appendix 14.A** for further information) have been carried out to review potential access routes. The proposed route for abnormal loads (shown on ES **Figure 14.1**) is from the Port of Ayr, and would follow the designated 'wind farm access route' from the Jura Terminal along Waggon Road. From here the access route would follow the A719, A77, A76 and the B741, entering the Development Site at a new junction off the B741 in the north western part of the Development Site. As the turbine delivery vehicles are abnormal indivisible loads, a Special Order is required under The Road Vehicles (Authorisation of Special Types) (General) Order 2003, which will be obtained prior to any deliveries taking place.
- 4.3.4 A traffic management plan (TMP) would be developed in discussion with EAC and Ayrshire Roads Alliance following award of consent and would set out all traffic management measures including any diversions, programming, stacking areas and vehicle movements on and off-site etc. An outline plan which would form the basis of these discussions is presented in ES **Chapter 14 – Traffic and Transport, Section 14.8.1**.

General Construction Traffic

- 4.3.5 General construction traffic, which would include flat bed trucks and Heavy Goods Vehicles (HGVs) delivering plant and equipment (e.g. excavators, bull dozers and cranes) as well as vans and cars associated with construction staff movement, will also access the Development Site from the north via new access on the B741 which runs along its northern boundary. Prior to the B741, the access routes for these vehicles will vary depending on the origin of the contractors and materials (depending on location of any quarries used to source stone in the event on-site borrow pits are not sufficient, for example).

4.4 Construction Process

- 4.4.1 The construction process set out below is largely the same as was described in the ES which accompanied the section 36 application of September 2015.

Proposed Programme

- 4.4.2 The construction period for the Proposed Development would be approximately 12 months in duration, and would comprise the following activities broadly listed in sequence:
- ▶ Construction of the Development Site access point;
 - ▶ Formation of the temporary construction compound including hard standing and temporary site office facilities;
 - ▶ Construction of on-site access tracks and passing places (as required), inter-linking the turbine locations and control building compound;

- ▶ Construction and upgrade of culverts under roads to facilitate drainage and maintain existing hydrology;
 - ▶ Opening and operating site borrow pit(s);
 - ▶ Operation of on-site concrete batching plant;
 - ▶ Construction of crane hardstanding areas;
 - ▶ Construction of turbine and anemometry mast foundations;
 - ▶ Construction of on-site control building and associated substation;
 - ▶ Excavation of trenches and cable laying adjacent to site roads;
 - ▶ Connection of on-site distribution and signal cables;
 - ▶ Delivery and erection of wind turbines and permanent anemometry masts;
 - ▶ Commissioning of site equipment; and
 - ▶ Development Site restoration (e.g. reinstatement of vegetation at track edges etc.).
- 4.4.3 Where possible, operations will be carried out concurrently (thus minimising the overall length of the construction programme). In addition, the Proposed Development will be phased such that, at different parts of the Development Site, the civil engineering works can continue whilst the proposed turbines are being erected. Development Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.
- 4.4.4 An indicative programme for construction activities is shown in **Figure 4.10**. The starting date for construction activities is largely dependent upon the date consent might be granted (which is outside the Applicant's control), and the grid connection date; subsequently the programme will be influenced by constraints on the timing of delivery and duration of any mitigation measures required, as outlined in the ES and this FEI and/or the consent.
- 4.4.5 The length of the programme will be dependent on seasonal working and weather conditions. Summer months are favoured for construction due to longer periods of daylight allowing longer working days (subject to any restrictions on construction hours). Summer months are generally also drier which aids the construction progress and reduces the amount of site debris reaching the public highway (mud etc.) (a watching brief will be maintained on the cleanliness of the public highways, with cleaning carried out by contracted road sweepers (if required)). Weather, particularly wind, has a strong influence on the timing of construction activities. Crane lifting activities are generally limited during strong winds (>11 m/s) and erection [of cranes and turbines?] during these weather conditions may be avoided for safety reasons. The actual limiting conditions will be reviewed as part of the crane lifting plan. During periods of cold weather, concrete pouring for the turbine bases may be prohibited (temperatures <4°C) and/or subject to specific cold weather working practices.

Hours of Working

- 4.4.6 For the purposes of this FEI, construction activities have been assumed to take place between 07:00 to 19:00 hours on week days (Monday to Friday) and 07:00 to 13:00 hours on Saturdays. Quiet on-site working activities (such as electrical commissioning) have been assumed to extend outside the core working times noted (where required). Working hours may be reduced at times due to seasonal or weather restrictions. Some works such as delivery of the components of turbines may take place outside the core working hours to reduce disturbance to other users of the road network.
- 4.4.7 Work outside these hours is not usual, though if required to meet specific demands (e.g. during foundation pours and highly weather dependent activities), permission for short term extensions to these hours would be sought from EAC as required.

Standard Construction Working Practices

- 4.4.8 Contractors' working areas will be clearly delineated on-site to ensure that no unnecessary disturbance is caused to any potentially sensitive areas.
- 4.4.9 Particular attention will be given to the storage and use of fuels for the plant on-site. Oil will be stored in accordance with the Water Environment (Oil Storage) (Scotland) Regulations 2006. Drainage within the temporary construction compound, where construction vehicles will park and where any diesel fuel will be stored, will be directed to an oil interceptor to prevent pollution in the event of any spillage occurring. Storage of diesel fuel will be within a bunded area or self-bunded tank in accordance with the Scottish Environment Protection Agency (SEPA) Pollution Prevention Guidelines. Standard construction working practices will be implemented during construction, operation and decommissioning in order to ensure adherence to Construction Industry Research and Information Association (CIRIA) guidance and other current best practice, including the following SEPA Pollution Prevention Guidelines (PPG):
- ▶ PPG 1 General Guide to the Prevention of Pollution;
 - ▶ PPG 2 Above Ground Oil Storage Tanks;
 - ▶ PPG 3 Use and Design of Oil Separators in Surface Water Drainage Systems;
 - ▶ PPG 4 Treatment and Disposal of Sewage Where No Foul Sewer is Available;
 - ▶ PPG 5 Works and Maintenance in, or Near, Water;
 - ▶ PPG 6 Working at Construction and Demolition Sites;
 - ▶ PPG 8 Safe Storage and Disposal of Used Oils; and
 - ▶ PPG 21 Pollution Incident Response Planning.
- 4.4.10 Due consideration will also be given to the following guidance documents:
- ▶ *Good Practice during Windfarm Construction* produced by Scottish Renewables (SR), Scottish Natural Heritage (SNH), SEPA and Forestry Civil Engineering (Version 3, 2015);
 - ▶ *Control of Water Pollution from Linear Construction Projects* (CIRIA C648, 2006), produced by CIRIA;
 - ▶ *Constructed Tracks in the Scottish Uplands* 2nd Edition, 2013, updated 2015, published by SNH; and
 - ▶ *Floating Roads on Peat*, 2010, published by Forestry Commission Scotland and SNH.

Health and Safety during Construction

- 4.4.11 Health and Safety is of vital importance to the Applicant and the requirements of the Construction (Design and Management) Regulations 2015 (CDM 2015) will be observed throughout the construction stage of the Development. If planning consent is granted, the Principal Contractor will be required to produce a Construction Phase Health and Safety Plan in accordance with CDM 2015 to outline and define the approach to Health and Safety that will be adopted specifically for the Proposed Development. In addition to CDM 2015, the Applicant and their Contractors will also adhere to other relevant UK Health and Safety legislation including:
- ▶ Health and Safety at Work Act 1974;
 - ▶ Management of Health and Safety at Work (Amendment) Regulations 2006;
 - ▶ Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013) (RIDDOR); and
 - ▶ Onshore Wind Health and Safety Guidelines, Renewable UK, 2015.

- 4.4.12 Method statements will be prepared and risk assessments undertaken for each work package prior to activities taking place.
- 4.4.13 The Applicant will directly appoint suitably experienced Contractors for the detailed design, procurement and construction of the Proposed Development. Selection will be based partly upon a Contractors' record in dealing with Health, Safety, Security and Environment (HSSE) issues and on the provision of evidence that the Contractor has incorporated HSSE considerations into its method statements, staffing and budgetary provisions.
- 4.4.14 The Applicant will also appoint a Project Manager for the duration of these phases to act as an interface between them and the Contractors. The Project Manager will also monitor the construction works and undertake the duties as defined in the CDM Regulations 2015.
- 4.4.15 Appropriate signage will be provided on the Development Site to highlight any hazards, areas that should be avoided or where unauthorised entry is prohibited. During the construction phase, public access on-site will be restricted for health and safety reasons.

Environmental Management during Construction

Construction Method Statement (CMS)

- 4.4.16 The Applicant will engage a Contractor to construct the Proposed Development. During the construction process, the Applicant will retain the services of any specialist advisers that may be required, for example on archaeology, ecology, and peat restoration, to be called on as required to advise on specific issues, including micro-siting. More detailed information on the role of such specialist advisors during construction is provided in the relevant ES and FEI chapters.
- 4.4.17 The final range of measures to be taken to reduce or mitigate the environmental impact of the construction phase will be captured in the Construction Environmental Management Plan CEMP, Pollution Prevention Plan (PPP), Site Waste Management Plan (SWMP) and emergency procedures that will all fall under the wider Construction Method Statement (CMS). The Contractor will employ an Environmental Clerk of Works (ECoW) during the construction phase who will take a key role in the preparation of the CEMP. The CEMP will ensure that the mitigation measures outlined in the ES and this FEI are fully implemented and environmental specialists will support the ECoW as required.
- 4.4.18 The CEMP, will as a minimum, implement all of the mitigation measures required during construction as identified as necessary within the ES and FEI to mitigate any likely significant adverse effects, and will outline a suite of control measures to manage the potential environmental impacts during this phase (including noise, pollution, surface water runoff and waste). It would draw on the standard construction practices outlined in ES **Sections 4.4.7 to 4.4.9**.
- 4.4.19 The CMS and supporting documents will be submitted for approval by EAC following consultation with bodies such as SEPA prior to construction and development. In order to ensure that they are being suitably adhered to by the appointed contractors, an independent and suitably qualified Engineer, who will also liaise with the various environmental advisers employed during the construction phase, will be appointed by the Applicant to monitor implementation and provide specialist advice.

Dust and Air Quality

- 4.4.20 There is the potential for an increase in dust during construction. However, as well established and effective dust control measures are used during the construction of wind farms, it is not expected that air quality will be affected. The main measures for managing dust that will be used where necessary are:
- ▶ Adequate dust suppression facilities will be used on-site. This will include the provision of on-site water bowsers with sufficient capacity and range to dampen down all areas that may lead to dust escape;

- ▶ Any on-site storage of aggregate or fine materials prone to dust generation will be managed using enclosures and screening if required so that dust escape from the site is avoided. Sheeting can also be provided for the finer materials that are prone to *'wind whipping'*;
- ▶ HGVs entering and exiting the Development Site will be fitted with adequate sheeting to totally cover any load carried that has the potential to be *'wind whipped'* from the vehicle;
- ▶ Vehicles used on-site will be regularly inspected and maintained, to minimise vehicle emissions and the risk of leaking diesel or hydraulic fluids;
- ▶ Good housekeeping or *'clean up'* arrangements will be employed so that the Development Site is kept as clean as possible. There will be regular inspections of the working areas and immediate surrounding areas to ensure that any dust accumulation, litter or spillages are removed/cleaned up as soon as possible; and
- ▶ A site liaison person will investigate and take appropriate action where complaints or queries about construction arise.

4.4.21 These measures would be included in the CEMP.

Site Waste Management

- 4.4.22 Where possible, and subject to geotechnical testing, any topsoil material generated by excavation of foundations is expected to be re-used on site. This would be re-used on the working areas or allocated for restoration purposes in cutover areas of the Development Site. Excavated material will (depending on type) be used to backfill excavations and for general restoration purposes where appropriate. It is not expected that any material will be unsuitable for re-use in this way, though in the unlikely event that such material arise, they would be disposed off-site in line with relevant waste disposal regulations.
- 4.4.23 Soil movement would be undertaken with reference to best practice guidelines available in the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009). Soil excavation should be undertaken during dry periods with backhoes and dump trucks wherever possible. Topsoil and subsoil should not be mixed or stored together.
- 4.4.24 The stockpiling of materials would be minimised and any essential stockpiles would be located as far away as possible from watercourses.
- 4.4.25 Steps will be taken to minimise the extraction of peat as per the Peat Management Plan (PMP) described in ES and FEI **Chapters 6 - Renewable Energy Policy, Carbon Balance and Peat Management**. The PMP will ensure that peat excavated during construction is safely and suitably re-used within the extent of the Development Site wherever possible.
- 4.4.26 Construction waste is expected to be restricted to normal non-hazardous materials such as off-cuts of timber, wire, fibreglass, cleaning cloths, paper and similar materials. These will be sorted and recycled if possible, or disposed of to an appropriately licensed landfill by the relevant contractor.

4.5 Construction Details

Infrastructure Construction

- 4.5.1 Construction of the Proposed Development will consist of two main elements. Firstly, civil and electrical construction of the infrastructure and secondly, erection and commissioning of turbines. Construction of the control building and the grid connection are lengthy processes which will commence early in the construction programme to allow a live grid connection to coincide with the commissioning of the turbines. It should be noted that many individual construction processes will run partly or fully concurrent whilst others will progress in a sequence with or without some overlap in time.
- 4.5.2 The location of the Development Site infrastructure is shown in **Figure 1.1**.

On-site Access Tracks

- 4.5.3 Typical track cross sections are shown in **Figure 4.2**. The design of a particular length of Development Site access track will depend on local geological, topographical and drainage conditions. In terms of design, the primary objectives that have informed the access tracks are:
- ▶ Requirements to maintain water flows across tracks and minimise disruption to the current hydrology;
 - ▶ Minimisation of peat spoil by routing tracks through areas of shallow or no peat where possible;
 - ▶ Mitigate and manage silt run off and surface water;
 - ▶ Serviceability requirements for construction and wind turbine delivery vehicles; and
 - ▶ Constructability considerations.
- 4.5.4 To achieve a track structure that meets the conditions encountered on the Development Site, whilst meeting the primary track design objectives, two different designs have been developed (each with associated construction techniques) as summarised in **Table 4.4**.

Table 4.4 Typical Access Track Construction Techniques

Design	Construction Method	Typical Site Conditions	Peat Depth (m)
1	Floating road	Deep, flat, stable areas of peat (track thickness estimated 600mm to 1,000mm)	≥1 m
2	Excavated road	Flat with simple drainage condition (track thickness estimated 450mm to 600mm)	<1 m

- 4.5.5 The alignment of the on-site tracks has already been subject to initial review by an experienced Civil Engineer and re-routed to respond to any constraints identified during construction. The final decision on alignment and on the appropriate type of access track design to adopt for a particular length of track will be made in advance of construction and may involve input from the ECoW as well as site engineers (and any other environmental specialists as required).
- 4.5.6 A peat depth survey, utilising a Russian sampler which extracts peat samples, has been carried out across all proposed infrastructure areas (See **Appendix 6.B** revised Peat Slide Risk Assessment). The survey identified several areas of deep peat, so some sections of track have the potential to require floating roads. The weight of a floating road is supported by the peat beneath, thereby avoiding the need for construction foundations to extend through to the underlying solid bedrock. Based on current knowledge of the Development Site, approximately 1,700m of floating tracks will be required, and they will be constructed in line with the good practice guidance produced by the Forestry Commission Scotland (FCS [FCS, SNH, SEPA, Scottish Renewables (SR) and Historic Environment Scotland (HES) (2015)]) and Forestry Civil Engineering (FCE) and SNH (2010), and will include the use of geogrids.
- 4.5.7 It is anticipated that approximately 12.07km of on-site access track will be required for the Proposed Development. All access tracks will be unpaved and constructed from material sourced from the on-site borrow pit(s) where possible. If sourcing of stone is not possible it will be imported from a suitable quarry, the effects of which have been assessed in **FEI Chapter 14 – Traffic and Transport**.
- 4.5.8 As previously noted, the running width of all on-site access tracks will be a maximum of 6m wide, with some additional localised bend widening to a maximum of approximately 12-14m (For the purposes of this EIA, a maximum running width of 6m has been assumed).
- 4.5.9 In general terms, the construction method for access tracks and passing places will see the topsoil being removed (and laid on the surrounding undisturbed vegetation until required for reinstatement) to expose a suitable sub-soil horizon on which a track can be constructed. A geo-grid will then be

placed to minimise the need for imported stone and to reduce the impact on the sub-soils. The track will then be built up on the geo-grid by laying and compacting crushed rock to an estimated depth of 450-600mm, dependent on ground conditions and load capacity. Post-construction, the stripped topsoil will be re-laid along the edges of the access track allowing the edges of the access track to re-vegetate whilst maintaining a suitable width throughout the operational period of generally up to 6m.

- 4.5.10 The detailed drainage design would be developed following consent being granted, but for the purpose of this EIA, the basic principles are that the drainage system would be developed:
- ▶ Based on Sustainable Drainage Systems (SuDS) principles; and
 - ▶ In accordance with the Water Environment (Controlled Activities) Regulations 2011, amended 2013, ("CAR" Regulations).

Watercourse Crossings

- 4.5.11 The number of watercourse crossings have been minimised in the Revised Layout as far as possible. However, five watercourse crossings with culverts are proposed in order to provide access to certain wind turbines. The water crossing locations are detailed in **Table 4.5** and are shown on **FEI Figure 13.1**.

Table 4.5 Watercourse Crossing Locations

Watercourse	Grid Reference
WC01	E 255308, N 608124
WC02	E 256194, N 607807
WC03	E 256277, N 607837
WC04	E 256442, N 607900
WC05	E 255787, N 608631

- 4.5.12 At this stage, it is proposed that a simple culvert type construction will be employed, using a cross sectional area that will not impede flow of water. Design of culverts shall be to at least CIRIA Culvert Design and Operation Guide (RP901) standard. A typical culvert detail is shown in **Figure 4.11**. All crossings would be designed to accommodate 1 in 200 year peak flows (with an allowance for climate change) to reduce the risk of flooding, and would be developed in accordance with Engineering in the Water Environment Good Practice Guide - River Crossings: Second Edition (SEPA, 2010) and River Crossings and Migratory Fish: Design Guidance (Scottish Executive 2000). Watercourse crossings will be subject to detailed design following the granting of consent.
- 4.5.13 The need for drainage will be established on-site during pre-construction surveys. The access tracks will have a suitable cross-fall to allow rainwater to be shed and, where gradients are present, lateral drains will intercept any flow along the road. Where ground conditions are of a permeable nature, swales will be utilised for drainage to allow natural filtering of surface water into the ground. Where areas are less free draining, land drains or drainage ditches will be installed where the topography and ground conditions dictate.
- 4.5.14 To prevent silt entering water courses, an ongoing scheme of silt mitigation will be carried out, which will include use of: silt traps; silt fences; silt mats etc, all installed to suit the local conditions. The silt mitigation measures will be monitored throughout the construction period by the Contractor and ECoW.

Service Crossings

- 4.5.15 British Telecom (BT) pole mounted telephone cables run alongside the B741. While maps supplied by BT show this cable running along the south side of the B741, site visits have shown that it is actually located to the north of this road and it is therefore not anticipated that it would interfere with site access.

Temporary Works: Construction Compound and Lay Down Area

- 4.5.16 It is proposed that one temporary construction compound with a maximum area of 10,000m² will be constructed. A typical compound arrangement is found in **Figure 4.4**. An additional temporary compound for the SPEN substation will be located either in this compound, or in the compound which houses the substation and control building.
- 4.5.17 Surface vegetation and topsoil will be removed from the area of the construction compound and laid on the surrounding undisturbed vegetation until required for reinstatement, post-construction. Geogrid will be laid on the exposed ground and stone added to an approximate depth of 500mm and compacted to a suitable engineering specification.
- 4.5.18 The compound will be located inside an area contained by 2.5m security fencing, if required by the Contractor. During periods of darkness, directional security lighting would be used. This lighting would conform to the institute of lighting professionals guidance for Zone E1 (*Guidance Notes for the Reduction of Obtrusive Light GN01:2011*) and would use a shielded downwards pointing installation.
- 4.5.19 The temporary compound will include: an area for portacabins (to be used as site offices and for the storage of various materials and small components); car parking; and welfare facilities including toilets, a kitchen and a mess room; storage and laydown areas for equipment, plant and construction vehicles; areas for storage of oils and fuel; and facilities for aggregate recycling and concrete batching (may be located adjacent to borrow pit(s)). Foul drainage will either be collected in a holding tank for regular collection and disposal off-site or by using an on-site septic tank. Areas of the compound which represent an increased pollution risk, e.g. oil or fuel storage and vehicle refuelling would be bunded, and drained into an isolated holding tank for treatment and disposal. The bund would ensure a protected volume of 110% of the stored capacity is provided. Drainage would be directed to an oil interceptor to prevent pollution if any spillage occurred.
- 4.5.20 Water extraction for welfare facilities will be provided via mains water supply where available. Where a mains supply is not available, water will be provided by a bowser or smaller containers. Compliant drinking water arrangements will be put in place.
- 4.5.21 The construction compound will be reinstated at the end of the construction phase. The aggregate forming the compound surface will be removed from the Development Site and the stored topsoil laid onto the exposed natural formation.
- 4.5.22 The detailed configuration, layout and size of the temporary compound would be finalised post consent and after appointment of a construction contractor.
- 4.5.23 The construction compound would also have areas set aside for the batching plant, along with general materials storage, this could be located next to the borrow pit(s).

General Plant and Equipment

- 4.5.24 A range of plant and equipment is expected to be delivered to the Development Site near the onset of the works and will be removed as soon as practical at the end of the activity for which the equipment relates.

Turbine Foundations

- 4.5.25 The final foundation design will be informed by the choice of turbine and detailed geotechnical investigation prior to construction. Foundation design will be undertaken by geotechnical engineers and structural designers, once ground conditions are established and the final turbine model selected.

- 4.5.26 Wherever ground conditions permit, turbine foundations will be constructed from reinforced concrete using a 'submerged gravity base' approach. If, following intrusive geotechnical investigation works, ground conditions are proven to be unsuitable for this approach, other forms of foundation will be used, such as piled turbine foundations (though this is not anticipated as being necessary at this stage as set out at **Section 4.5.32** below).
- 4.5.27 Typical gravity foundations are presented in **Figure 4.12**. Construction of gravity base foundations will involve the excavation of soil/peat and subsoil to expose the underlying load bearing strata or bedrock. Any topsoil and other vegetation removed will be laid on the surrounding undisturbed vegetation until required for reinstatement once the turbine is installed.
- 4.5.28 The load bearing strata or bedrock will be levelled off and blinded³ prior to the in-situ casting of the steel-reinforced concrete slab that will be approximately 25m in diameter. The depth of the excavation will be approximately 3-4m, depending on the depth of the load bearing strata or bedrock, and the sides will be battered back to ensure that they remain stable during construction. Each foundation is made up from approximately 750m³ of concrete and approximately 100 tonnes of reinforcing steel.
- 4.5.29 On top of the slab, a concrete up-stand will then be cast, to which the turbine tower will later be bolted. The excavated area will be backfilled with compacted layers of graded material from the original excavation, and capped with topsoil. The exact details of each foundation will vary across the Development Site in response to the actual ground conditions encountered. A detailed ground investigation will be undertaken prior to construction to establish the requirement at each foundation.
- 4.5.30 Turbine excavations may be open for four to eight weeks during the construction programme. During this time, excavations will be kept free from water (rainwater and run-off). If local topography permits, the excavations will be free draining. If not, excavations may be mechanically pumped, with all dewatering works carried out in accordance with SEPA's Pollution Prevention Guidelines including discharges through either settling ponds, swales or mechanical silt traps.
- 4.5.31 Alternative methods of turbine foundation construction will be considered if required in light of the results of a detailed geotechnical site investigation.
- 4.5.32 Due to the depths of peat encountered on-site and the desk based assessment of the Development Site geology, it is considered that gravity base foundations will be suitable. Therefore the use of piled foundations has not been considered further in the EIA.

Crane Pads

- 4.5.33 Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. The total area of hardstanding at each turbine location, including the turbine foundations and the crane pad will be approximately 1,250m².
- 4.5.34 Surface vegetation and soil/peat will be removed from the area of the crane pad and laid on the surrounding undisturbed vegetation until required for reinstatement. The area will then be covered with geo-grid overlain with compacted stone to approximately 500mm depth, dependent on ground conditions and load capacity.
- 4.5.35 As noted, crane hardstandings will be left in place following construction in order to allow for the use of similar plant should major components need to be replaced during the operational phase of the Proposed Development. These could also be utilised during decommissioning phase.

Permanent Anemometry Mast Foundation and Crane Pad

- 4.5.36 The two permanent anemometry masts will have reinforced concrete foundations of ~5m x 5m to ensure that each would withstand severe weather conditions, and each will have an adjacent crane pad of a similar type to the turbines with dimensions 20m x 20m.

³ A process whereby a 50mm layer of low grade concrete is placed directly onto the bedrock to provide a level and firm working base to support the foundation reinforcing cage.

Control Building and Substation

- 4.5.37 The turbines will be connected through suitable switchgear to be installed in the proposed control building on-site (approximately centred on E 255430, N 608980). The control building compound will comprise a hardstanding with maximum dimensions of approximately 180m x 110m and a single storey building approximately 30m x 20m which will house switchgear, metering, protection and control equipment as well as welfare facilities. The control building will comprise a single storey building which will house switchgear and metering, DC battery power supply unit, Low Voltage (LV) auxiliary supply and distribution consumer unit, protection and control equipment and also welfare facilities. Concrete foundations will be required to take the weight of the components. Attached to the control building will be a secure steel palisade fenced compound, consisting of a hardstanding for the 33kv to 132kV SPEN substation and associated compliance plant. There will also be allocated areas used for storage and maintenance purposes. Consent is sought for the location and footprint of the SPEN substation with the site layout plan, ground floor plans and elevations to be submitted in accordance with planning conditions attached to the consent should approval be granted. A construction compound for the SPEN substation will be accommodated either within the temporary construction compound or within the compound which accommodates the substation and control building.
- 4.5.38 Foul drainage will be collected in a septic tank with soakaway. Water extraction for welfare facilities will be provided via mains water supply where available, and if not available, water will be provided by a water harvesting and UV filter system. If this is not suitable for the Development Site then other compliant drinking water arrangements will be put in place such as provision of commercially available drinking water.
- 4.5.39 **Figure 4.7** provides an illustration of the indicative control building and compound. The external finishes/materials would be chosen to blend in with the local vernacular of the area. Final details including external finishes would be agreed with EAC as a condition following consent being granted.
- 4.5.40 Surface vegetation and soil/peat will be removed from the area of the compound and laid on the surrounding undisturbed vegetation until required for reinstatement, post-construction. The area will then be overlain with compacted stone to approximately 500mm depth depending on ground conditions.

Power Cabling

- 4.5.41 Underground cables will link the turbines to the on-site control building and substation. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 1,000mm deep and up to 1,200mm wide. To minimise ground disturbance, cables will be routed alongside the access tracks wherever practicable and, if not, the total footprint of construction activity will be stated within the CMS. Approximately 10km of cable trenches will be required to connect the turbines to the on-site control building, with installation methods potentially including burial in ducts across the tracks, burial in trenches and mole-ploughing. **Figure 4.6** shows a typical cable trench detail.
- 4.5.42 Any excavations will be cordoned off and marked clearly. Cable hauling operations will be coordinated with traffic movements, especially when hauling is being carried out from the roadway. Cable off-cuts and waste from terminations will be systematically collected, stored and recycled or disposed of properly.
- 4.5.43 The trenches would be dug during periods of relatively dry weather. The electric cables would be placed within the trenches and soils quickly replaced to minimise the ingress of water into the trenches. Regularly spaced clay bunds may be required in the trench backfill to prevent the introduction of preferential flow paths within the cable trenches.

Peat Management during Construction

- 4.5.44 The Development Site is situated in an area where peat deposits are found. The Revised Layout, design and construction methodology has been refined to minimise peat excavation from tracks and turbine infrastructure, but it has not been possible to avoid it entirely.

- 4.5.45 Peat is likely to be excavated during the construction of tracks, foundations, hardstandings, control building, SPEN Substation and temporary compounds. The majority of peat spoil will come from foundations, hardstandings and track construction and, to a lesser extent, temporary compounds.
- 4.5.46 A draft Peat Management Plan (PMP) has been prepared and it will be finalised prior to construction and following completion of detailed ground investigations and micro-siting. The PMP will be further refined and detailed methods and specifications agreed with SEPA and SNH. This will address methods in respect of peat excavation, haulage, storage, re-use and degraded habitat restoration. The PMP will ensure that peat excavated during construction is safely and suitably re-used within the extent of the Development Site wherever possible.
- 4.5.47 Details of the updated draft PMP and peat slide risk assessment are provided in **Chapter 6**.

Track Drainage

- 4.5.48 The need for drainage on the access track network will be considered for all parts of the track network separately, since slope and wetness vary considerably across the Development Site. In flat areas, drainage of floating tracks is not required as it can be assumed that rainfall on the road will infiltrate to the ground beneath the tracks or along the verges. Track-side drainage will be avoided where possible, in order to prevent any local reductions in the water table or influences on the tracks structure and compression (the latter can occur where a lower water table reduces the ability of the peat to bear weight, increasing compression).
- 4.5.49 Where tracks are to be placed on slopes, lateral drainage will be installed on the upslope side of the track. The length of drains will be minimised, to prevent either pooling on the upslope side or, at the other extreme, creating long flow paths along which rapid runoff could occur. Regular cross-drains will be required to allow flow to pass across the track (as recommended in SEPA's Position Statement WAT-PS-06-02 Culverting of Watercourses [December 2006]), with a preference for subsequent re-infiltration on the downslope side, rather than direct discharge to the drainage network.

Drainage Ditches along Excavated Tracks

- 4.5.50 Excavated tracks can impede the natural drainage across them and consequently drainage ditches are required. It is anticipated that at times, the water in the ditches will contain high concentrations of sediment from excavations, track construction and possibly other accidental pollutants from construction activities. Therefore no water from a drainage ditch will be discharged directly to a watercourse. Instead it will pass through silt fences, silt traps or other best practice pollution control features. Drains will not be discharged directly into natural channels, ephemeral streams or old ditches.
- 4.5.51 If required, any discharge, once sediment has been removed as described above, would occur under the appropriate SEPA consent.
- 4.5.52 The ditch design will be considered in line with the recommendations of the FCE and SNH guidance (2010), including the use of flat-bottomed ditches to reduce the depth of disturbance.
- 4.5.53 In instances of drainage close to surface watercourses, discharge from the drainage may be to surface water rather than re-infiltration. In these situations, best practice control measures including sediment settlement will be undertaken before the water is discharged into surface water systems. The discharges will be small and collect from only a limited area, rather than draining a large area to the same location.
- 4.5.54 Although drainage will be provided in areas of disturbance as required, areas of hardstanding will be minimised so that this need is reduced. This includes careful design of construction compounds, and minimising the size of crane pads at each turbine location.

Cross Drainage

- 4.5.55 Where tracks are to be placed on slopes, lateral drainage will be required on the upslope side of the road. The length of drains should be minimised, to prevent either pooling on the upslope side or, at the other extreme, creating long flow paths along which rapid runoff could occur. The spacing of cross drains will depend on the area draining to the cross drain, gradient, choice of material for the drain, and design objective. Where cross drains are required, depending on-site conditions, the aim will be for subsequent re-infiltration on the downslope side rather than direct discharge to the drainage network.
- 4.5.56 Cross-drainage may be achieved using culverts or pipes beneath the track, again in line with the FCE and SNH (2010) guidance. Drainage will be installed before or during track construction, rather than afterwards, to ensure that the track design is not compromised. The cross drainage will flow out in to shallow drainage, which will allow diffuse re-infiltration to the peat on the downslope side. The cross drains will flow out at ground level and will not be hanging culverts: the avoidance of steep gradients for the tracks will also reduce the risk of erosion occurring at cross-drain outflows.

Check Dams

- 4.5.57 Check dams (small dams built across channels or ditches) may be required at regular intervals in the drainage ditches alongside an excavated track. They are required for two principal reasons. Firstly they act as a silt/pollution trap slowing the flow of water so allowing sediment to settle out. Secondly, they help to direct water into the cross drains and so allow natural drainage paths to be maintained as much as possible. The spacing of the check dams will depend on the following factors:
 - ▶ The gradient of the track;
 - ▶ The spacing of cross-drains; and
 - ▶ The depth of excavation.
- 4.5.58 Regular maintenance and clearing of the check dams is imperative to ensure their effectiveness is maintained.

Interface between different Types of Road Drainage

- 4.5.59 Where the track construction method changes, the drainage methods will also change. If this results in an end point for a drainage ditch, the ditch will be piped across the road and allowed to discharge to land on the down side of the slope (taking into account the precautions against pollution and erosion discussed in **Section 4.5.55 to 4.5.56**).

Materials Import

Rock Requirements

- 4.5.60 Construction of access tracks, hardstandings, foundations, and compounds within the Proposed Development will require approximately 85,000m³ of rock. **Table 4.6** below provides a breakdown of the required rock volumes for each construction element. It is anticipated that all of the rock required will be sourced from the on-site borrow pit(s).

Table 4.6 Summary of Rock Volumes Required during Construction

Infrastructure	Total Rock Volume (m ³)
Hardstandings and foundations	23,600
Access tracks	46,525
Temporary compounds	5,000

Infrastructure	Total Rock Volume (m ³)
Control building compound	9,900
Total Rock Volume	85,025

On-site Rock Source Areas & Borrow Pits

- 4.5.61 Three potential borrow pit search areas were identified in the ES. This was based on geological information from a high level desk study, along with knowledge of the site gained from surveys and walkovers. These search areas were identified by desk study and professional judgement, with the final location of each borrow pit within each search area; number and estimate of material to be won being determined once full ground investigation works and testing have been completed.
- 4.5.62 As a result of the reduction in turbine numbers and further assessment in response to comments from SEPA (Borrow Pit Assessment provided in **Appendix 4.A**), the number of borrow pit search areas has been reduced from three to two. The two remaining search areas shown in **Figure 1.1** represent suitable areas on-site in which borrow pits could be excavated.
- 4.5.63 The estimated volumes of stone available from the borrow pit search areas are indicated in **Table 4.7**. This represents 100% of the likely required volume of stone for construction, though it is recognised that detailed investigations may mean a relatively higher or lower proportion is secured from the potential borrow pit search area.

Table 4.7 Estimated Volumes of Rock Available from the Borrow Pit

Search Area	Borrow Pit Search Area (m ²)	Estimated Area Excavated (m ²)	Total Estimated Rock Volume (m ³)*
A	136,000	30,000	90,000
B	73,000	10,000	30,000
Total Rock Volume			120,000

*assuming an average borrow pit depth of 4m, (1m-8m) and 75% recovery rate

4.5.64 It is recognised that the borrow pits have the potential to give rise to a range of environmental effects which need to be managed. As noted above the extraction requirement cannot be confirmed until detailed intrusive investigations are undertaken. However a preliminary borrow pit design has been undertaken, further details of which are in **Appendix 4.A**. The plan addresses establishment, extraction and restoration phases with the management protocols for the borrow pits to be included in the CMS, which is envisaged to be subject to an appropriate planning condition. Any quarrying activities will also follow the Approved Code of Practice, Health and Safety at Quarries Regulations 1999. The likely effects and proposed mitigation that would be anticipated to address effects is likely to include:

- ▶ Traffic – The majority of traffic moving stone will use on-site access tracks. Any requirement to access highways will be addressed through a Traffic Management Plan (TMP);
- ▶ Blasting – Effects from blasting will be controlled through use of relevant protocols, blast mats and through appropriate communication and publicity about blasting occurrence. Blasts at each borrow pit can be expected to be infrequent, and at some distance from residential receptors and are therefore not anticipated to be of any substantive concern, nor likely to give rise to significant effects;
- ▶ Noise / vibration – Potential effects arise from blasting itself as well as the use of excavation and stone crushing equipment. Use of appropriately silenced equipment, publicity over blasting, adherence to operational hours (10.00 to 16.00 on Monday to Friday and 10.00 to 16.00 on Saturday and Sunday)

12.00 on Saturdays for borrow pits as per the anticipated planning conditions) and the distance to residential receptors provide the main mitigation for such effects which are anticipated to be well within limits of acceptability established by guidance;

- ▶ Dust – Residential receptors are at a considerable distance from potential borrow pit areas (closest at ~500m) and thus no dust effects on them are expected. Some potential for dust to be deposited on adjacent vegetation exists, though with damping down of surfaces or use of mist sprays as appropriate, this should avoid any significant effects (and this would be assessed by the appointed ECoW);
- ▶ Visual intrusion – Construction effects will be discernible through the presence of construction machinery. Long term, an appropriate restoration plan for the borrow pit(s) will be developed in agreement with consultees (SEPA, SNH, EAC) which is expected to include some re-grading of the final profile and measures to encourage re-vegetation and potentially peat habitat restoration;
- ▶ Water - The potential for sediment laden water to be released will be controlled through appropriate design and treatment facilities at the borrow pit(s). Design will be specific to each location and where possible will encourage natural infiltration;
- ▶ Water - The potential for ingress of water to excavations will be controlled by gravity drainage to settlement lagoons, and encouraging natural infiltration. Where dewatering is required, giving rise to additional potential effects of excavations on the surrounding groundwater levels, the re-use of filtrated water from the settlement ponds may be used to provide a compensatory water source for any groundwater-dependent features by discharging to a vegetated surface just upgradient of their location; and
- ▶ Wastes – Any waste arising will be handled as per other construction wastes.

Concrete Batching Plants

- 4.5.65 A concrete batching plant will be required as there are no nearby readymix concrete suppliers. The batching plant will require the import of sand and cement, as well as a supply of water in order to produce concrete. For the vehicle movements we have assumed a worst case that all aggregates will need to be imported. A water extraction license under CAR will be required, assuming up to 50m³ per day.
- 4.5.66 The batching plant would contain conveyor belts, hoppers and a loading area where the concrete mixers will be filled up from above. Concrete mixers would travel between the batching plant and the wind turbine foundations and would thus stay within the confines of the Development Site during the construction phase. Areas of the batching plant will be enclosed within a bund and have an impervious base that would drain to a silt lagoon. The raw material storage area within the batching plant would comprise sand and processed rock bays and cement silos.
- 4.5.67 The majority of the concrete is required for turbine foundations with additional material for control building, transformers, and permanent anemometry mast foundations. **Table 4.8** provides an estimate for each.

Table 4.8 Estimated Volume of Concrete

Infrastructure	Total Volume of Concrete (m ³)
Wind turbine foundation x 16	Up to 12,000
Control building foundation	360
Sub Station HV Plinths	375
Anemometry mast foundations	25
Turbine kiosk foundations	144

Infrastructure	Total Volume of Concrete (m ³)
Total Concrete Volume	Up to 12,904

Post-Construction Development, Site Restoration and Commissioning

- 4.5.68 If required for major works, the crane hardstanding can be re-used in its entirety by removing the dressed vegetation. Excavated material which does not have a viable and suitable identified use will be classified as waste material, and would be managed and removed from the Development Site and disposed of in accordance with the relevant legislation (including the Environmental Protection Act 1990, Landfill (Scotland) Regulations 2003 and the Waste Management Licensing (Scotland) Regulations 2011).
- 4.5.69 The temporary construction compound and associated facilities will be removed and fully re-instated with vegetation/peat displaced from elsewhere on the Development Site and landscaped to match the local topography.
- 4.5.70 There will be a period of commissioning and testing prior to the start of the full operational phase of the Proposed Development.

4.6 Operational Details

Land Management

- 4.6.1 It is anticipated that the long term land management practices in relation to the agriculture undertaken at the Development Site will continue unaffected by the Proposed Development with normal agricultural practices continuing unimpeded after completion of construction.
- 4.6.2 On-site access tracks have been sited alongside field boundaries where possible to minimise effects on continued management.

Meteorological Effects and Turbine Control

- 4.6.3 A Supervisory Control and Data Acquisition (SCADA) system will be implemented which would obtain information from each of the turbines on their performance, and would allow them to be controlled remotely. This would allow any faults with the equipment at the Proposed Development to be highlighted.
- 4.6.4 Although wind turbines are designed to stop generating at wind speeds over 25m/s, they are built to withstand very high wind speeds, and are normally certified against structural failure for wind speeds up to 60m/s (in excess of 120mph).
- 4.6.5 Turbines are fitted with a lightning protection system as part of their design, and snow does not generally pose problems other than for gaining access to the Development Site. Occasionally very heavy snow and ice may affect anemometers or the aerodynamics of the turbine blades resulting in temporary automatic shutdown. After shutdown due to icing, the turbine can be restarted remotely further to a manual, visual or technical inspection to ensure that the turbine blades are free of ice, thereby eliminating the potential for 'ice-throw'. The wind turbines will also be fitted with vibration sensors which would detect any imbalance which might be caused by icing, which would allow the turbines to be shut down automatically.
- 4.6.6 While ice-throw is unlikely for the reasons described, notices would be installed at access points to the Proposed Development to warn visitors and members of the public of the possible risk of ice throw in colder weather.

Turbine Maintenance

- 4.6.7 Each manufacturer has specific maintenance requirements but typically routine maintenance or servicing of turbines is carried out twice a year, with a main service at twelve monthly intervals and a minor service at 6 months. In the first year, there is also an initial three month service after commissioning. The turbine being serviced is switched off for the duration of its service.
- 4.6.8 Teams of two people with a 4x4 vehicle would carry out the servicing. It takes two people (on average) one day to service each turbine.
- 4.6.9 At regular periods through the project life, oils and components will require changing, which will increase the service time. Gearbox oil changes are required approximately every 18 months. Changing the oil and worn components will extend each turbine service by one day.
- 4.6.10 Blade inspections will occur as required (somewhere between two and five years) using a cherry picker or similar, but may also be performed with a 50T crane and a man-basket. It could take up to three weeks to inspect all of the turbines at the Proposed Development. Repairs to blades would utilise the same equipment.
- 4.6.11 Blade inspection and repair work is especially weather-dependent. Light winds and warm, dry conditions are required for blade repairs. Hence summer months (June, July and August) are typically the most appropriate period for this work.

Environmental Management during Operation

- 4.6.12 The Applicant's wind energy developments are operated in accordance with documented ISO 14001 environmental management procedures which ensure compliance with applicable environmental legislation and best practice.
- 4.6.13 Although activity at the Development Site will be limited during the operational period, the measures outlined in site and task specific risk assessments and method statements including control measures in relation to surface water runoff, dust, pollution control and waste will remain in place to cover any maintenance works which may be required.
- 4.6.14 The Proposed Development will be managed by a team of wind energy engineers whose duties will include compliance with statutory HSE requirements. Where potential environmental or health and safety hazards are identified, a site specific risk assessment is completed, and control measures implemented to ensure that the risks are minimised as far as possible.
- 4.6.15 The operational phase of the Proposed Development would be managed under the requirement of E.ON's internal Environmental Management Systems (EMS).

Site Waste Management

- 4.6.16 Operational waste will generally be restricted to small volumes of waste associated with machinery repair and maintenance disposed of by the maintenance contractors in line with normal waste disposal practices.

4.7 Decommissioning Details

Wind Farm Decommissioning Requirements

- 4.7.1 At the end of the Proposed Development's operational lifetime, there are two options available:
- ▶ To re-power the Development Site with new turbines, which would require a new application and further environmental assessment; or
 - ▶ To remove the wind turbines, met masts, kiosks, control building and SPEN substation and re-instate the Development Site.

- 4.7.2 The EIA assumes the latter option of decommissioning at the end of the 25 years operational phase. It is generally proposed that the above ground structures (wind turbines, kiosks, met mast and control building/sub-station) will be removed (per any condition attached to the consent if granted) and the hardstanding areas re-instated where appropriate. Access tracks may be left in situ for use by the landowner (subject to any necessary statutory approvals, e.g. planning permission).
- 4.7.3 Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Some of the potential issues could include:
- ▶ Potential disturbance by the presence of cranes, HGVs and engineers on-site;
 - ▶ On-site temporary construction compound would need to be located appropriately;
 - ▶ Time of year and time-scale (to be outside sensitive periods); and
 - ▶ Access tracks may remain in use for the benefit of the landowner and other stakeholders.
- 4.7.4 A comprehensive plan for the work will be drawn up in advance of decommissioning to ensure safety of the public and workforce and the use of the best available techniques at that time.

Decommissioning Process

- 4.7.5 The wind turbines (towers, nacelle, hub, blades and electrical kiosk) will be completely removed using a crane and taken off-site for recycling. The only parts which are currently difficult to recycle are the composite blades. Most items will be broken down so that specialist vehicles are not required unless there is a potential follow on use for the components in one piece.
- 4.7.6 During decommissioning, the bases will be broken out to below ground level and covered by soil/peat, which will be reinstated and re-vegetated (this is considered to be less environmentally damaging than removing them completely). All cables would be cut off below ground level, de-energised and left in the ground.
- 4.7.7 A Restoration and Decommissioning Plan (RDP) would be submitted and agreed with the relevant authorities close to the Proposed Development's end-of-life. Any applicable new legislation or guidelines published prior to decommissioning would be considered and taken into account in relation to any design of mitigation prior to decommissioning taking place.

Control Building and Distribution System Decommissioning

- 4.7.8 The control building and associated equipment will be removed and the components reused or recycled. As with turbine bases, the foundations themselves will be cut down to below ground level and left in situ covered in soil/peat which will be re-vegetated.
- 4.7.9 The buried distribution cables will be de-energised and will be cut off below ground level at the ends. An assessment will be carried out closer to the time to take into account any changes in best practice, and if it is considered to be viable, cables may be recovered for recycling where appropriate.

Access Track Decommissioning

- 4.7.10 The access tracks are unlikely to be removed. The current view is that the disturbance associated with the removal and disposal of the material would have much a greater environmental effect than leaving them in place. Upon decommissioning the tracks would therefore likely be left in situ for future use by landowner and other stakeholders.

4.8 References

- Control of Water Pollution from Linear Construction Projects (CIRIA C648, 2006), produced by CIRIA.
- Culvert Design and Operation Guide (C689) (CIRIA), 2010.

Constructed tracks in the Scottish Uplands, SNH, 2nd edition 2013, updated 2015.

Engineering in the Water Environment Good Practice Guide - River Crossings: Second Edition, SEPA, 2010.

Environmental Protection Act 1990, Landfill (Scotland) Regulations 2003 and the Waste Management Licensing (Scotland) Regulations 2011.

Floating Roads on Peat, A Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland, Prepared by: Forestry Civil Engineering & Scottish Natural Heritage, August 2010.

Good practice during wind farm construction – A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Historic Environment Scotland and Forestry Commission Scotland, 3rd edition 2015.

General Guide to the Prevention of Pollution: PPG1, Pollution Prevention Guidelines, Scottish Environment Protection Agency.

General Guide to the Prevention of Pollution: PPG 2, Pollution Prevention Guideline Above Ground Oil Storage Tanks.

Guidance Note GS6 – Avoiding Danger from Overhead Lines, HSE, 2013.

Guidance Notes for the Reduction of Obtrusive Light GN01, Institute of Lighting Professionals, 2011.

Pollution Prevention Guidelines: PPG 3, Use and design of oil separators in surface water drainage systems.

Pollution Prevention Guidelines: PPG 4, Treatment and disposal of sewage where no foul sewer is available.

Pollution Prevention Guidelines: PPG5, Works and Maintenance in or Near Water, Scottish Environment Protection Agency.

Pollution Prevention Guidelines: PPG 6, Working at Construction and Demolition Sites, Scottish Environment Protection Agency.

Pollution Prevention Guidelines: PPG 8 Safe storage and disposal of used oils.

Position Statement WAT-PS-06-02 Culverting of Watercourses, SEPA, 2006

River Crossings and Migratory Fish: Design Guidance, Scottish Executive, 2000.

Water Environment (Controlled Activities) (Scotland) Regulations, 2011, updated 2013.

Water Environment (Oil Storage) (Scotland) Regulations, 2006.

5. Planning Policy Context

5.1 Introduction

- 5.1.1 This Chapter provides an overview of changes to the applicable planning policy framework since the submission of the section 36 application which are of relevance to the EIA undertaken for the Proposed Development.
- 5.1.2 As this chapter only identifies relevant planning policy changes it should be read in conjunction with **Chapter 5 – Planning Policy Context** and **Chapter 6 - Renewable Energy Policy, Carbon Balance and Peat Management** of the ES, as well as with FEI **Chapter 6 - Renewable Energy Policy, Carbon Balance and Peat Management**, in relation to relevant climate and energy policies. Details regarding the specific implications of the planning policy changes identified in this Chapter are provided where relevant within the technical assessments presented in FEI Chapters 6 – 17.
- 5.1.3 For the avoidance of doubt, this Chapter does not assess the Proposed Development's accordance with relevant planning and renewable energy policies. The applicant submitted a separate Planning Statement (Amec Foster Wheeler, October 2015), which assesses in detail how the Proposed Development accords with relevant planning policies and other valid considerations.

5.2 Changes in Planning Policy

National Planning Policy, Guidance and Advice

- 5.2.1 There have been no changes to the key national planning policy documents, namely the Scottish Planning Policy (SPP) (2014) and the National Planning Framework 3 (NPF3) (2014), since the submission of the section 36 application. However, the following relevant changes to national guidance and advice publications have occurred:
- ▶ The Historic Environment Scotland Position Statement (June 2016) has replaced the Scottish Historic Environment Policy (2011) and the Managing Change in the Historic Environment: Setting guidance note has been revised (June 2016);
 - ▶ The Scottish Government's Chief Planner letter regarding renewable energy targets and the consideration of socio-economic impacts (dated 11th November 2015) and Draft Advice on Net Economic Benefit and Planning (March 2016) are now relevant considerations;
 - ▶ The Carbon and Peatland Map 2016, published by Scottish Natural Heritage (SNH) on 29th June 2016, defines Scotland's nationally important resource of deep peat, carbon rich soils and priority peatland habitats. Under Table 1 of the SPP (2014) these are to be identified on wind energy spatial frameworks as "*Group 2 – Areas of Significant Protection*".

Development Plan

- 5.2.2 At the time of writing this Chapter (December 2016) there have been no changes to the adopted statutory Development Plan applicable to the Development Site comprising:
- ▶ The Approved Ayrshire Joint Structure Plan 2007; and
 - ▶ The Adopted East Ayrshire Local Plan 2010.

Other Material Considerations

East Ayrshire Local Development Plan Examination Report

- 5.2.3 The relevance of the East Ayrshire Local Development Plan (LDP) Proposed Plan (2015) to the EIA undertaken for the Proposed Development was considered in **Section 5.4 – Other Material Considerations** within **ES Chapter 5 – Planning Policy Context**.
- 5.2.4 The main change to the applicable planning policy framework is that the emerging East Ayrshire LDP has progressed towards adoption, as the East Ayrshire LDP Proposed Plan Examination Report (referred to as Examination Report) was published on 6th December 2016. The Applicant participated in this formal examination in relation to their representations submitted to East Ayrshire Council (EAC) in spring 2015 regarding relevant proposed policies, maps and text within the East Ayrshire LDP Proposed Plan (2015).
- 5.2.5 The recommendations within the Examination Report are largely binding on the planning authority, and East Ayrshire Council therefore have three months from 6th December 2016 to make these modifications before submitting the finalised East Ayrshire LDP to the Scottish Ministers for their consideration. Pending the outcome of this process it is assumed that East Ayrshire Council will adopt the East Ayrshire LDP as the new Development Plan for East Ayrshire in spring 2017, replacing the Ayrshire Joint Structure Plan 2007 and the East Ayrshire Local Plan 2010.
- 5.2.6 The relevant modifications to the LDP Proposed Plan as a result of the Examination Report are summarised as follows:
- ▶ Deletion of proposed policies:
 - ▶ RE4: The Cumulative Impact of wind energy proposals;
 - ▶ RE5: Wind Energy and the Landscape;
 - ▶ RE7: Removal of Wind Turbines;
 - ▶ RE8: Community Benefits; and
 - ▶ RE10: Compliance Monitoring.
 - ▶ Deletion of proposed maps:
 - ▶ Map 13: Onshore wind framework;
 - ▶ Map 14: Landscape sensitivity for turbines of 70 metres and above; and
 - ▶ Map 15: Landscape sensitivity for turbines between 50 and 70 metres.
 - ▶ Alteration of Map 12: Spatial Framework for Wind Energy Development over 50m in height;
 - ▶ Revision of the first paragraph of section 2.2 and paragraph 2.13 to emphasise the importance of renewable and wind energy generation within vision statements;
 - ▶ Revision of paragraphs 6.1.10 and 6.1.11 regarding the respective status and policy implications of Group 2 and 3 areas on Map 12;
 - ▶ Revision of Schedule 1 – Renewable Energy Assessment Criteria, including deletion of reference to the East Ayrshire Wind Landscape Capacity Study as a specific criterion.
 - ▶ Modification of proposed policies:
 - ▶ OP1: Overarching Policy;

- ▶ Policy RE1: Renewable Energy Developments¹;
- ▶ RE3: Wind Energy Proposals over 50m in height;
- ▶ RE9: Financial Guarantees;
- ▶ ENV7: Wild Land and Sensitive Landscape Areas;
- ▶ ENV8: Protecting and Enhancing the Landscape;
- ▶ ENV10: Carbon rich soils;
- ▶ ENV11: Flood Prevention; and
- ▶ ENV12: Water, Air and Light and Noise Pollution.

5.2.7 Taking account of all modifications resulting from the Examination Report, the LDP Proposed Plan components and policies still of relevance to the Proposed Development are noted in **Table 5.1**. In the interests of brevity **Table 5.1** focuses on identifying any pertinent changes resulting from the Examination Report, rather than providing detailed summaries of plan components or individual criteria within proposed policies.

¹ This modification confirms that Policy RE1: Renewable Energy Developments is not relevant to the determination of wind energy development proposals.

Table 5.1 Relevant Proposed Policies and Proposals from the East Ayrshire LDP Proposed Plan (2015) as modified by the East Ayrshire LDP Examination Report (2016)

Plan Component or Proposed Policy	Summary
Paragraph 2.13 – Rural Area Vision Statement	<p>This paragraph provides a 20 year vision statement for the Rural Area of East Ayrshire, which the Development Site lies within.</p> <p>Now modified to assert that, within the period of the vision statement, <i>“wind energy development will have taken place to ensure that the potential for electricity and heat from renewable sources is achieved, in line with national climate change targets, whilst giving due regard to relevant environmental, community and cumulative impact considerations”</i>.</p>
Policy OP1: Overarching Policy	<p>This general policy sets out criteria to provide a framework for all development management decisions.</p> <p>As modified, criteria (ii) and (x) now require consideration of the acceptability of any predicted impacts on environmental quality, landscape character and tourism interests.</p>
Map 12: Spatial Framework for Wind Energy Development over 50m in height and supporting paragraphs 6.1.10 and 6.1.11	<p>Map 12: Spatial Framework for Wind Energy Development over 50m in height provides a wind energy spatial framework, as required by the SPP (2014). Supporting paragraphs 6.1.10 and 6.1.11 explain the policy tests associated with Map 12 for the assessment of wind energy development proposals.</p> <p>A new version of Map 12 dated August 2016 (produced by EAC) is now to be included within the LDP. According to this new map, the majority of the Development Site lies within <i>Group 3 – Areas with potential for wind farm development</i> whilst some land is within <i>Group 2 – Areas of significant protection</i> owing to the identification of localised deep peat, carbon rich soils or priority peatland habitats on the SNH Carbon and Peatland Map 2016.</p> <p>As modified, paragraphs 6.1.10 and 6.1.11 and Policy RE3 (see below) make clear that the policy test applicable to development proposals in Group 2 - Areas of Significant Protection (as per Table 1 of the SPP [2014]²) applies only in respect of the environmental characteristics which result in the land falling within Group 2 and not in relation to all predicted environmental effects.</p>

² This policy test requires wind energy development proposals located in Group 2 areas to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.

Plan Component or Proposed Policy	Summary
Policy RE3: Wind energy proposals over 50 metres in height	<p>This policy provides an assessment framework for wind energy development proposals exceeding 50m in height. The policy should be considered in conjunction with Schedule 1, Map 12 and paragraphs 6.1.10 and 6.1.11.</p> <p>As noted above, this modified policy and paragraphs 6.1.10 and 6.1.11 make clear that the policy test applicable to development proposals in Group 2 - Areas of Significant Protection (as per Table 1 of the SPP (2014) applies only in respect of the environmental characteristics which result in the land falling within Group 2 and not in relation to all predicted environmental effects. The modified policy also clarifies the limited scope of statutory Supplementary Guidance which will support the implementation of this policy.</p>
Schedule 1 – Renewable Energy Assessment Criteria	<p>This schedule lists criteria which are to be considered where relevant in the assessment of renewable energy development proposals against paragraphs 6.1.10 and policy RE3.</p> <p>The modified schedule clarifies certain assessment criteria and introduces a new criterion regarding peat and forestry management.</p>
Policy RE9: Financial Guarantees	<p>This policy sets out the circumstances under which a financial guarantee would be sought by EAC in relation to a development proposal.</p> <p>As modified, the policy limits the requirement for financial guarantees in respect of wind energy development proposals to only “<i>where necessary in terms of the scale and complexity of the proposal, and the consequences of any failure to restore the site</i>”.</p>
Policy T1: Transportation requirements for new development	<p>This policy requires development proposals to satisfy all requisite standards of the Ayrshire Roads Alliance and to align with the Regional and Local Transport Strategies.</p> <p>No modifications.</p>
Policy T4: Development and Protection of Core Paths and Natural Routes	<p>This policy requires development proposals to protect recreational and non-vehicular routes from disruption and adverse impacts.</p> <p>No modifications.</p>
Policy ENV1: Listed Buildings	<p>This policy sets out criteria to protect and preserve listed buildings.</p> <p>No modifications.</p>

Plan Component or Proposed Policy	Summary
Policy ENV2: Scheduled Monuments and Archaeological Resources	<p>This policy requires development proposals not to have an adverse effect on Scheduled Monuments or on their settings “<i>unless there are exceptional overriding circumstances</i>”.</p> <p>No modifications.</p>
Policy ENV4: Gardens and Designed Landscapes	<p>This policy sets out criteria to protect and enhance Gardens and Designed Landscapes included in the National Inventory.</p> <p>No modifications.</p>
Policy ENV6: Nature Conservation	<p>This policy requires all development proposals to respect the importance of nature conservation and biodiversity.</p> <p>No modifications.</p>
Policy ENV7: Wild Land and Sensitive Landscape Areas	<p>This policy seeks to safeguard areas of wild land and gives priority to the protection and enhancement of the landscape within Sensitive Landscape Areas in relevant planning determinations. The policy also sets out the circumstances in which development proposals will be allowed within these areas.</p> <p>The modified policy clarifies that “<i>areas of wild land</i>” refers to Wild Land Areas as identified on the SNH Wild Land Areas Map (2014).</p>
Policy ENV8: Protecting and Enhancing the Landscape	<p>This policy sets out criteria to protect and enhance landscape character in Rural Areas of East Ayrshire.</p> <p>The modified policy requires consideration of the acceptability of impacts on landscape character and value by virtue of the loss of landscape features.</p>
Policy ENV9: Trees, Woodland and Forestry	<p>This policy sets out criteria to protect trees, hedgerows and woodlands.</p> <p>No modifications.</p>
Policy ENV10: Carbon Rich Soils	<p>This policy recognises the importance of and sets out criteria to safeguard carbon rich soils and peatlands.</p> <p>The modified policy requires wind energy development proposals located on carbon rich soils to demonstrate “<i>that the balance of advantage in terms of climate change mitigation lies with the energy generation proposal, and that any significant effects on these areas can be substantially overcome by siting, design or other mitigation</i>”.</p>

Plan Component or Proposed Policy	Summary
Policy ENV11: Flood Prevention	<p>This policy outlines the Council's approach to flood risk management and explains how the Flood Risk Framework detailed in SPP (2014) will be applied in relevant planning determinations.</p> <p>The only modification is the insertion of a criterion to encourage the use of "<i>water resistant and/or resilient construction materials and measures</i>" where relevant.</p>
Policy ENV12: Water, Air and Light and Noise Pollution	<p>This policy sets out requirements relating to the minimisation of water, air, light and noise pollution.</p> <p>The modified policy contains a new requirement for 6m wide maintenance access buffer strips to be provided between all development proposals and adjacent watercourses.</p>
Policy TOUR4: The Dark Sky Park	<p>This policy sets out criteria to protect the Galloway Forest Dark Sky Park designation, in particular from light pollution.</p> <p>The modified policy does not include reference to a 10km Transition Zone around the Dark Sky Park; rather this Transition Zone is addressed within Supplementary Guidance, which is to be adopted on a statutory basis.</p>
Policy TOUR5: Galloway and Southern Ayrshire Biosphere	<p>This policy encourages development that would support the aims of the Galloway and Southern Ayrshire Biosphere, but it does not include a presumption against specific development types.</p> <p>No modifications.</p>
Policy RES11: Residential Amenity	<p>This policy sets out criteria to protect residential amenity.</p> <p>No relevant modifications.</p>

Planning Policy Framework for Dumfries and Galloway

- 5.2.8 In the Applicant's view, any consultation response received from Dumfries and Galloway Council regarding the Proposed Development should focus upon the acceptability of potential effects within Dumfries and Galloway Council's administrative area, rather than on the hypothetical accordance of the Proposed Development with the Development Plan and wider planning policy framework for Dumfries and Galloway. This approach is needed as whilst the environmental impacts of a development proposal are demonstrably valid considerations in any planning determination (regardless of the location of the development site), the specific policy tests within one planning authority's Development Plan and wider planning policy framework cannot be rolled over to assess development proposals located within a different planning authority area, where a different suite of Development Plan policies apply and cover many of the same environmental issues³. Nevertheless, the adopted Dumfries and Galloway Development Plan and wider planning policy framework is considered to be of some relevance to this FEI owing to the potential for indirect effects on that Council's administrative boundary.
- 5.2.9 The Dumfries and Galloway Development Plan remains unchanged from the time of submission of the section 36 application. It therefore comprises the Dumfries & Galloway Local Development Plan (adopted 2014) ('the Dumfries and Galloway LDP') and associated adopted Statutory Supplementary Guidance.
- 5.2.10 The only relevant changes to the planning policy framework for Dumfries and Galloway are that in September 2016, the Council published new Draft Part 1 Wind Energy Development Supplementary Guidance for public consultation, as well as the Dumfries and Galloway Wind Farm Landscape Capacity Study – Consultation Report: September 2016 (Carol Anderson Associates, September 2016). The relevance of these draft documents, albeit being limited considering their status, is that they identify policy issues for consideration by Dumfries and Galloway Council as a consultee and provide revised landscape character and sensitivity information (which is considered within **Chapter 9 – LVIA** of this FEI).
- 5.2.11 Dumfries and Galloway Council intend that in early 2017, the Part 1 Wind Energy Development Supplementary Guidance (with any post consultation modifications) will be approved by the Council and submitted to the Scottish Ministers as candidate Statutory Supplementary Guidance and will thereafter be adopted as part of the statutory Development Plan for Dumfries and Galloway. Once adopted, the new Part 1 Wind Energy Development Energy Supplementary Guidance would replace the existing adopted Part 1 Wind Energy Development Supplementary Guidance (2015).

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³ This FEI supports both an application made to the Scottish Ministers under section 36 of the Electricity Act 1989 (as amended) and a request that the Scottish Ministers issue a direction under section 57(2) of the Town and Country Planning Act 1997 (as amended). Any deemed planning permission granted by the Scottish Ministers would include planning conditions which would need to be discharged solely by the relevant planning authority; in this case East Ayrshire Council.

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6. Renewable Energy Policy, Carbon Balance and Peat Management

6.1 Introduction and Overview

- 6.1.1 This chapter summarises changes in renewable energy policy and climate change frameworks since the section 36 application, updates the assessment of effects in relation to peat in terms of the Revised Layout and provides revised information in relation to renewable energy generation and carbon balance figures. It also highlights how consultation comments in respect of peat have been addressed within a revised Peat Management Plan (PMP) (FEI **Appendix 6.A**).

6.2 Changes to Renewable Energy, Climate Change and Planning Policy Frameworks

- 6.2.1 This section summarises changes in renewable energy policy and climate change frameworks since the submission of the section 36 application; other renewable energy policy and climate change frameworks that remain relevant are provided in ES **Chapter 6 - Renewable Energy Policy, Carbon Balance and Peat Management**. The section also identifies changes to the planning policy context since the submission of the section 36 application which are relevant to this FEI Chapter.

Changes in Energy and Climate Change Policy Frameworks

- 6.2.2 At the international level the only policy change of relevance since the submission of the section 36 application is that the Paris Agreement (UNFCCC, 2015) was agreed in December 2015 and, upon ratification by signatories responsible for more than 55% of global greenhouse gas emissions, came into force on 5th October 2016 (UNFCCC, 2016). The Agreement's main aim is to keep a global temperature rise this century "well below" 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels. The main climate change mitigation delivery mechanism is the submission of five yearly Nationally Determined Contributions (NDCs) by all signatories with a steadily increasing ambition in the long term. The relevance of the Paris Agreement to the Proposed Development is that it now governs the setting of, and efforts to achieve, European and national targets for greenhouse gas emissions reduction over the long term. This should ensure a continued focus on the decarbonisation of the energy generation sector, including through the deployment of mature renewable energy technologies such as onshore wind.
- 6.2.3 At the European level, the European Union's (EU) submission to the Paris Agreement establishes an overall binding commitment to reduce domestic greenhouse gas emissions by at least 40% by 2030 compared to 1990, in line with targets set out in the EU 2030 Climate & Energy Policy Framework (October 2014). Given the result of the EU referendum held on 23rd June 2016, in due course it may be necessary for the UK Government to submit separate NDCs to the UNFCCC. However, at the present time the UK remains a member of the EU and is therefore obligated to contribute towards achieving the emissions reduction targets specified in the EU's submission to the Paris Agreement.
- 6.2.4 At the UK level the only policy change of relevance since the submission of the section 36 application is that on 30th June 2016 the UK Government confirmed its intention set the Fifth Carbon Budget to reduce UK greenhouse gas emissions by 57% by 2030 relative to 1990 levels. This is in line with advice provided to the UK Government by the UK Committee on Climate Change. At the Scottish level, the *2020 Routemap for Renewable Energy in Scotland - Update 2015* (Scottish Government, December 2015) reaffirms the Scottish Government's support for the deployment of renewable energy generating technologies. The publication notes that "onshore wind has a pivotal role in delivering our 2020 renewable targets, and also ensuring that

communities have the opportunity to benefit from the huge economic potential of renewable energy”.

Renewable Energy Targets

- 6.2.5 All of the 2020 renewable energy generation targets detailed within **Chapter 6** of the ES remain valid (and, as noted below, unmet). In particular, notwithstanding the result of the UK’s EU referendum, as a current member of the European Union it remains obligated to achieve the binding target of generating 15% of all energy consumed from renewable sources by 2020.
- 6.2.6 *Energy in Scotland 2016* (Scottish Government, 2016a) states that renewable energy generation provided a 13.1% share of the energy needed to meet Scotland’s gross final energy consumption, and a 5.1% share of gross final energy consumption across the UK in 2013. The *Energy Statistics Summary - September 2016* publication (Scottish Government, 2016b) states, on a provisional basis, that renewable electricity generation provided the equivalent of approximately 56.7% of Scotland’s electricity needs in 2015, against a Scottish Government target of 100% for 2020. This indicates a 12.3 percentage point increase in the proportion of renewable energy generation to meet Scotland’s electricity needs compared with the statistics reported within **Chapter 6** of the ES, largely attributable to new onshore wind farms becoming operational. However, of critical importance is that both the Scottish Government’s and the binding EU renewable energy generation targets for the UK for 2020 remain substantially unmet.
- 6.2.7 As at June 2016, Scotland’s renewable electricity generating capacity landscape was as follows (Scottish Government, 2016b):
- ▶ 8.1GW (Gigawatts) of capacity was operational;
 - ▶ 8.7GW of capacity was either under construction or consented;
 - ▶ 4.5GW of capacity was within the planning system; and
 - ▶ A total of 21.3GW of renewable electricity generating capacity, comprising a range of technologies, was either existing, consented or in planning, nearly three times the level deployed at the end of 2015.
- 6.2.8 Despite this increase in renewable energy generation capacity, it is noted that “*not all the projects consented will progress to commissioning*”, due to multiple factors and meeting the 2020 targets therefore “*remains challenging*” (Scottish Government, 2016b).

Changes to Planning Policy Context

- 6.2.9 FEI **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 6.2.10 Relevant changes to national planning policy, advice and guidance since the submission of the section 36 application are:
- ▶ Publication of the Scottish Government’s Chief Planner letter regarding renewable energy targets and the consideration of socio-economic impacts (dated 11th November 2015); and,
 - ▶ Publication of the Carbon and Peatland Map 2016 (Scottish Natural Heritage, June 2016). This provides a strategic overview of the likely distribution of peat and carbon-rich soils within the UK which is summarised, with regard to the Development Site, in FEI **Appendix 6.B (Peatland Hazard and Risk Assessment [PSHRA])**. This overview is supplemented by site-specific studies that provide a more accurate understanding of these resources, the results of which are presented in FEI **Appendix 6.A (PMP)**, FEI **Appendix 6.B (PSHRA)** and ES **Chapter 11 (Ecology)**.
- 6.2.11 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th

December 2016. As detailed within **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of 'modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:

- ▶ Policy OP1: Overarching Policy;
- ▶ Map 12: Spatial Framework for Wind Energy Development over 50m in height and supporting paragraphs 6.1.10 - 6.1.11;
- ▶ Policy RE3: Wind energy proposals over 50 metres in height;
- ▶ Schedule 1 – Renewable Energy Assessment Criteria; and
- ▶ Policy ENV10: Carbon Rich Soils.

6.3 Carbon Savings

- 6.3.1 The installed capacity of a wind turbine is a measure of its maximum rated output. In the context of the Revised Layout the installed capacity is will be a maximum of up to 54.4 Megawatts (MW) (assuming 16 x 3.4MW machines), a decrease of 8.3MW on the maximum for the Original Layout as noted in **Chapter 6** of the ES as a result in the deletion of three turbines. The carbon saving calculations presented in **Chapter 6** of the ES are updated in this FEI chapter.
- 6.3.2 Calculations of the likely electricity generation of the turbines are dependent on the 'capacity factor', which involves an assessment of the actual output of the development against its installed capacity¹. On this basis and with an expected installed capacity of up to 54.4MW, the maximum amount of electricity produced by the Proposed Development has been estimated to be up to 156,878MWh per year based on the expected site specific capacity factor of 32.92%. This figure has been derived from over two years of wind monitoring from the two temporary anemometer masts installed at the Development Site². This capacity factor has been used to calculate carbon dioxide (CO₂) savings as a result of the Proposed Development, shown in **Table 6.1**.
- 6.3.3 It is widely accepted that electricity produced from wind energy has a positive benefit with regard to reducing CO₂ emissions. However, in estimating the actual carbon saving, it is important to consider the mix of alternative sources of electricity generation, for example, coal, oil and gas powered. To represent this energy mix, Renewable UK recommends the use of a static figure of 430g of CO₂ saved for every kWh generated (Renewable UK, undated).
- 6.3.4 The average domestic consumption in Scotland, based on sales per household, was 3,915kWh in 2014 (compared to a UK average figure of 3,954 kWh in 2014) whilst the average domestic consumption in East Ayrshire in 2014 was 3,713kWh, which is lower than both the Scottish and UK average. (The Department for Energy and Climate Change [DECC], 2016)
- 6.3.5 For the purposes of this assessment, it is relevant to consider electricity demand in the vicinity of the Proposed Development (i.e. within East Ayrshire).
- 6.3.6 The potential electricity generation and 'Homes Equivalent' electricity generation (based on 3,713kWh annual domestic consumption in East Ayrshire) are provided in **Table 6.1**. The potential CO₂ savings as a result of the Proposed Development generating electricity instead of conventional power stations, with an assumed 430g CO₂ per kWh generated, are also presented.

¹ The net capacity factor of a wind farm is the ratio of its actual energy output (after energy losses within the wind farm have been accounted for) over a defined period of time (typically a year) to its energy output, had it operated at maximum power output continuously, over the same period of time.

² This figure based on empirical data is substantially greater than the average Scottish capacity factor of 27%, the long term average figure for Scotland published by Department of Energy and Climate Change (DECC), Energy Trends Section 6: Renewables (ET6.1 Renewable Electricity Capacity and Generation, July 2016. Capacity factor for Scotland - 27%. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/437811/et6_1.xls.

Table 6.1 Potential CO₂ Savings and Electricity Generation

Capacity Factor (%)	Electricity Generation (MWh per year) ³	Homes Equivalent (based on average East Ayrshire consumption of 3, 713Wh)	Carbon dioxide savings (Tonnes of CO ₂ per year) based on Renewable UK savings figure (electricity generation x 0.43)
32.92	156,878	42,251	67,458

6.4 Carbon Storage and Emissions

- 6.4.1 SEPA has objected to the section 36 application on the grounds of lack of information in relation to the disturbance and re-use of excavated peat; further details are provided in Table 1.1 of the revised Peat Management Plan (PMP) (FEI **Appendix 6.A**).
- 6.4.2 The Revised Layout has been designed to reduce potential effects on peat as much as possible. As a result there is a ~25% reduction in the predicted volume of peat that will need to be excavated compared with the Original Layout – this is because deleted turbines 15, 16 and 18 were all located on peat greater than 1m deep. Proposals are presented in the PMP for peat reinstatement / restoration which demonstrate that all of the excavated peat can be utilised on the Development Site. The PMP also sets out how consultee comments have been addressed.
- 6.4.3 Control measures are identified to protect peat during stripping and temporary storage / stockpiling activities. These control measures are also designed to ensure that stripped peat remains viable, throughout the construction works.
- 6.4.4 It is therefore anticipated that the revisions to the layout and the further information provided will allow SEPA to remove its objection.

6.5 Carbon Balance and Payback Calculation

- 6.5.1 Excavation of peat to construct the Proposed Development will result in a reduction in carbon storage and, potentially, increased CO₂ release from disturbed organic soil. The potential volume of peat that will need to be excavated is quantified within the revised PMP (see FEI **Appendix 6.A**). There will also be carbon emissions associated with the construction, servicing, maintenance and decommissioning of a wind farm development. These will offset the potential carbon savings identified in **Table 6.1**.
- 6.5.2 The calculation of the carbon balance provides a mechanism by which the carbon losses can be weighed against the carbon savings attributable to the wind farm during its lifetime⁴. Based upon work undertaken by Nayak *et al.* (2008) and Smith *et al.* (2011) this is summarised as the length of time (in years) that it will take the carbon savings attributable to renewable energy generation to balance the carbon costs associated with the manufacture of components and construction of the wind farm and is referred to as the 'payback period'. This information can then inform decision makers of the performance of a wind farm development in terms of overall carbon savings.
- 6.5.3 Following the introduction of a new web-based version of the carbon calculator (Scottish Government, 2016c), a query was submitted to the Local Energy Consents Unit (LECU) regarding which version to update for the FEI. In their email response of 22nd September 2016, LECU stated that the version used in the ES should be updated for consistency.

³ For example using a 32.92% capacity factor, figures are derived as follows: 54.4MW (16 × 3.4MW turbine) × 8,760 hours/year × 0.3292 (capacity factor) = 156,878MWh.

⁴ There were no specific stakeholder responses to the carbon payback calculator that was submitted with the original ES.

- 6.5.4 The assessment below is therefore based upon carbon balance figures calculated using version 2.9.0 of the calculator (Scottish Government, 2014).
- 6.5.5 The calculator compares the potential annual rate of emissions savings that may be achieved due to displacement of other fuel sourced electricity (grid-mix, coal-fired and fossil fuel-mix). Both the coal-fired and fossil-fuel mix emission figures are based on historic averages from Digest of UK Energy Statistics which smooths out anomalies due to weather, cost and other variables. The most widely accepted emission figure for assessing carbon payback is the grid mix which includes electricity generated from renewable sources, nuclear power and fossil fuels. This also has an element of future generation factored in, as advised by DECC. It is considered that coal-fired and grid-mix emissions represent the best-case and worst-case scenarios respectively, and these are presented in the Carbon Calculator Spreadsheet in FEI **Appendix 6.C**. A table showing the justification for each value entered into the carbon balance calculator is provided in FEI **Appendix 6.D**. A spreadsheet setting out the relevant peat depth calculations which feed into the carbon balance calculator is included as **Appendix A** in FEI **Appendix 6.A, PMP**.
- 6.5.6 The following sections outline the specific values for the carbon losses and carbon gains associated with the Proposed Development. For each input parameter, an expected, minimum and maximum value is requested to provide an expected, best case and worst case scenario for the carbon payback. For the Proposed Development, a turbine capacity of up to 3.4MW has been input with up to 16 as the number of turbines for the best case and worst case scenarios.

Carbon Balance

- 6.5.7 The manufacturing, construction and installation (including concrete) of the wind turbines at the Development Site has an associated carbon cost. The carbon emissions associated with the manufacture, construction and decommissioning of the 16 3.4MW turbine expected case, is 43,602 tonnes CO₂ equivalent (t CO₂e), which equates to approximately 34.8% of total CO₂ losses.
- 6.5.8 The carbon payback model attributes carbon losses due to the requirement for extra capacity to back up wind power generation at times of peak demand. This is quantified as a percentage of total capacity, which was input as 5% for this case (the recommended figure within the model), and equates to 38,838 t CO₂e (i.e. approximately 31.0% of total carbon dioxide losses).
- 6.5.9 Carbon losses associated with CO₂ release from soil organic matter for the expected case amount to 41,838 t CO₂e which equates to approximately 33.4% of total carbon dioxide losses. These losses result from peat removal and drainage effects following excavation of peat for items of infrastructure, notably turbine foundations, hard standings and access tracks, as well as borrow pits. It is worth noting that this figure assumes 100% loss of CO₂ from removed/disturbed peat, as this is the default value within the carbon model and cannot be amended. In reality, losses are likely to be considerably less than this, as it is expected that all of the peat will be used in reinstating the Development Site (see the PMP, FEI **Appendix 6.A**).
- 6.5.10 Further carbon losses are generated by the reduction of carbon fixing potential which occurs due to the loss of bog plants as a result of wind farm construction. For the expected case, this is 1,002 t CO₂e, which equates to approximately 0.8% of total carbon dioxide losses.
- 6.5.11 There are no carbon gains due to bog restoration or early removal of drainage from foundations and hardstandings. However, within the PMP (see FEI **Appendix 6.A**), it is predicted that all peat will be re-used within the Proposed Development for habitat reinstatement.

Carbon Payback

- 6.5.12 The fossil fuel sourced grid mix scenario is considered to be the most appropriate for calculating the carbon payback time⁵. On this basis, the payback for the Proposed Development is predicted to be 1.2 years for the Expected Outcome. The payback period assuming a fossil fuel sourced grid

⁵ <http://www.gov.scot/Publications/2008/06/25114657/15>

mix scenario could be as low as 0.6 years for the best case scenario, but increases to 2.2 years for the worst case scenario (see **Table 6.2**).

- 6.5.13 At the FEI Gatecheck meeting at the Scottish Government Local Energy and Consents Unit on 06.12.16, a question was raised regarding the Carbon Calculator and whether this makes any allowance for any turbine curtailment that may be proposed as potential mitigation for bats. Whilst the Carbon Calculator spreadsheet makes no such allowance, the lower capacity factor presents a worst case scenario which is believed to accommodate any potential additional reduced carbon savings losses associated with curtailment, see FEI **Appendix 6.D** for further details.

Table 6.2 Payback in years for each Scenario used in the Carbon Calculator

Fuel source	Carbon payback time (yrs.)	Carbon payback time (yrs.)	Carbon payback time (yrs.)
	Expected outcome	Best case scenario	Worst case scenario
Coal fired	0.9	0.4	1.6
Grid mix	2.0	1.0	3.6
Fossil fuel mix	1.2	0.6	2.2

6.6 Summary

- 6.6.1 The calculation of carbon balance and payback has been based on the expected values where site specific data are available and worst case assumptions where they are not.
- 6.6.2 It is predicted that the carbon loss in developing the Proposed Development will be paid back in ~1.2 years (~4.8% of the 25 year operational life) based upon the fossil fuel mix and the expected outcome. Given the worst case scenario based upon the fossil fuel mix, the Proposed Development will have achieved the carbon balance within ~2.2 years (~8.8% of the 25 year operational life). This compares to ~1.5 years for the expected outcome and ~3.6 years for the worst case for the Original Layout (see ES **Chapter 6**).
- 6.6.3 On the basis of a capacity factor of 32.92%, the calculator predicts potential annual CO₂ savings of 102,285 tonnes/year using the fossil fuel mix of electricity generation. This compares to a figure of 67,458 tonnes/year when applying a flat 430g of CO₂ savings per kWh (**Table 6.1**).
- 6.6.4 Using the lower figure, the Proposed Development could result in a total carbon saving of approximately 1.7M tonnes over its 25 year operational life, and generate electricity to annually supply the equivalent of 42,251 average homes in East Ayrshire.
- 6.6.5 The Revised Layout has been designed to reduce potential effects on peat as much as possible, for example with the deletion of three turbines (15, 16 and 18) which were all located on peat more than 1m deep. As a result there is a ~25% reduction in the predicted volume of peat that will need to be excavated compared with the Original Layout.

6.7 References

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7. Noise

7.1 Introduction and Overview

- 7.1.1 The following chapter presents all of the information provided to the local authority since the submission of the section 36 application. It also considers application consultation responses, turbine noise emissions from the Revised Layout of the Proposed Development, and a revised assessment of likely effects of the Revised Layout in the context of noise, in isolation and cumulatively with submitted, existing and consented onshore wind farm developments.
- 7.1.2 The noise limits adopted in the assessment of the Proposed Development operating in isolation have been derived in a form suitable for an appropriately worded noise condition. An assessment of cumulative noise impacts, and the associated limits have been included to demonstrate that the Proposed Development, operating at its proposed consented allowance, would not result in noise limit exceedances.
- 7.1.3 When operational, wind turbines emit two types of noise – mechanical noise and aerodynamic noise. More information in relation to this is provided in Section 7.2.4 of **Chapter 7 – Noise** of the ES.

7.2 Changes to Policy and Legislative Context

- 7.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 7.2.2 The national legislative and policy context of the Proposed Development has remained unchanged since the submission of the section 36 Application. The key national guidance document on the assessment of noise is Planning Advice Note 1/2011 (PAN 1/2011) issued in March 2011, which advocates the use of ETSU-R-97 when assessing noise arising from wind farms.
- 7.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
- ▶ Policy OP1: Overarching Policy;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height;
 - ▶ Schedule 1 – Renewable Energy Assessment Criteria;
 - ▶ Policy ENV12: Water, Air and Light and Noise Pollution; and
 - ▶ Policy RES11: Residential Amenity.

7.3 Application Consultation Responses

- 7.3.1 Prior to the submission of the section 36 Application, Amec Foster Wheeler on behalf of the Applicant, undertook consultations with the Council's Environmental Health Officer (EHO) on 26th May 2014 and 18th June 2014. The EHO confirmed the acceptability of Amec Foster Wheeler's proposed assessment methodology, baseline noise monitoring locations, and that the operational noise assessment would be based upon the methodology outlined within ETSU-R-97 Guidance, as recommended within the Scottish Governments' web based renewables advice.

- 7.3.2 Following submission of the section 36 Application, ACCON UK Ltd (ACCON), acting on behalf of EAC, undertook a review of the submitted documents relating to noise ('ACCON UK Ltd, project number: A2177/Enoch Hill/16, 04.11.15). The ACCON review confirmed that the 'methodologies used in the noise chapter represent good practice and are in line with the IOA Good Practice Guidance for wind turbines'. The ACCON review also made the following concluding remarks, which will be addressed in this chapter:
- i. *We recommend that any consent should be conditioned with noise limits closer to the predicted noise levels than the ETSU derived noise limits adopted in the ES noise chapter. We propose that daytime noise limits should use the ETSU derived limits as a starting point, but using 35 dB LA90 as the fixed part of the limit. We have applied the following adjustments based on the headroom between the predicted noise levels for Enoch Hill and these limits. Where the headroom between the predicted noise level and the ETSU derived limit is less than 3 dBA, the limit is taken as the predicted noise level (rounded up to the nearest whole decibel). Where the headroom is between 3 and 5 dBA, the limit is taken as 1 dBA less than the ETSU derived limit. Where the headroom is greater than 5 dBA, the limit is taken as 3 dBA less than the ETSU derived limit. In this way any consented scheme will not be significantly different to that considered within the Environmental Statement and development should not be constrained.*
 - ii. *For the night-time period we propose that the limit should be reduced from 43 dB LA90 to 38 dB LA90 except for properties with a financial involvement in the development where a 45 dB LA90 limit would apply. This measure in itself would be a positive step towards ensuring that a reasonable level of protection from night-time disturbance is achieved. This should not constrain development.*
 - iii. *Additionally, it would be appropriate if the development were consented to ensure that any post commissioning noise measurements are followed up by continuous noise monitoring for at least one sensitive receptor location. The noise monitoring should be for a period of at least one year and possibly longer.*

Proposed Noise Condition Limits

- 7.3.3 In addition to the review, ACCON provided an example condition that is in keeping with the approach outlined in its remarks i. and ii. Amec Foster Wheeler notes that this approach is not supported within policy, in particular the adoption of a lower fixed night-time noise limit of 38 dB LA90, where the ETSU-R-97 Guidance: *The Assessment of Rating of Noise from Wind Farms* (1996) ("ETSU-R-97 Guidance") recommends 43 dB LA90. Whilst Amec Foster Wheeler does not support the use of lower fixed night-time noise limits less than 43 dB LA90, in this instance, given the levels of assessment margin, the adoption of a lower fixed night-time noise limit of 38 dB LA90, when considering the operation of the Proposed Development in isolation, has been applied (or 45 dB LA90 for financially involved properties, as advocated within the ETSU-R-97 Guidance).
- 7.3.4 With regards to the daytime noise limits, it is noted that lower fixed daytime noise limits of 40 dB LA90 have been adopted for nearby consented developments such as Windy Standard Wind Farm. However, given the levels of assessment margin and the comments made by ACCON, a lower fixed daytime noise limit of 35 dB LA90 has been adopted when considering the Proposed Development in isolation.
- 7.3.5 Assessments of the cumulative noise impacts at receptors have assumed daytime and night-time lower fixed noise limits of 35 dB LA90 and 43 dB LA90, respectively, as advocated within the ETSU-R-97 Guidance.
- 7.3.6 With regards to the ACCON proposed noise limits, and assuming the original 19 turbine layout, it is noted that adopting a lower fixed daytime noise limit of 35 dB LA90 and a lower fixed night-time noise limit of 38 dB LA90 would result in predicted turbine noise levels **1.0 dB** and **4.0 dB** below the daytime and night-time noise limits, respectively. It is noted that the ACCON review, and associated noise limits, do not fully consider the likely cumulative noise impacts, in particular those that would occur should the Proposed Development operate at its full consented allowance. For instance, at Receptor R3 – Maneight, the night-time noise limit outlined by ACCON at 12ms⁻¹ is 38 dB LA90; therefore the Proposed Development would be consented to operate up to this limit. The

- cumulative assessment cannot therefore also adopt a night-time noise limit of 38 dB L_{A90} at 12ms⁻¹ as the full allowance has already been used by the Proposed Development.
- 7.3.7 Taking into account the points outlined above, Amec Foster Wheeler has attached noise limits, suitable for a proposed noise condition, to be applied to the Proposed Development operating in isolation. The attached noise limits are based upon a lower fixed daytime noise limit of 35 dB L_{A90} (as advocated in the ETSU-R-97 Guidance) and night-time of 38 dB L_{A90} . The proposed noise limits to be included within a suitable condition have been drafted using the following steps, and is included within FEI **Appendix 7.A**:
1. **Daytime noise limit** - based upon a lower fixed limit of 35 dB L_{A90} (or 45 dB L_{A90} for financially involved properties, as advocated within the ETSU-R-97 Guidance), or the measured background sound level plus 5 dB, whichever is greater. The derived daytime noise limit is reduced where it can be demonstrated that the cumulative impact of the immissions from cumulative developments and the Proposed Development operating at its maximum consented allowance, exceeds a daytime noise limit of 40 dB L_{A90} , or the measured background sound level plus 5 dB, whichever is greater; and
 2. **Night-time noise limit** - is based upon a lower fixed noise limit of 38 dB L_{A90} (or 45 dB L_{A90} for financially involved properties, as advocated within the ETSU-R-97 Guidance), or the measured background sound level plus 5 dB, whichever is greater. The derived night-time noise limit is reduced where it can be demonstrated that the cumulative impact of the immissions from cumulative developments and the Proposed Development operating at its maximum consented allowance, exceeds a daytime noise limit of 43 dB L_{A90} , or the measured background sound level plus 5 dB, whichever is greater.
- 7.3.8 It is noted that the proposed noise limits detailed in FEI **Appendix 7.A**, relate to noise immissions from the Proposed Development operating in isolation. The predicted noise immissions from the Proposed Development have been assessed against the proposed noise limits in FEI **Appendix 7.C** and FEI **Appendix 7.D**.
- 7.3.9 Where necessary, adjustments have been made to the noise limits where it has been demonstrated that the Proposed Development, operating to its full consented allowance, would result in an exceedances of the cumulative noise limits (daytime and night-time noise limits of 40 dB L_{A90} and 43 dB L_{A90} , respectively), when considered in combination with submitted, consented and operational wind developments.
- 7.3.10 Limits that relate to the cumulative noise immissions are not considered appropriate, in particular when demonstrating compliance at a property where the dominant noise immissions are not from the Proposed Development, and the Applicant has no legal controls or influence over the 'offending' development. The cumulative assessments shown in FEI **Appendix 7.E** and FEI **Appendix 7.F**, and the associated noise limits, have therefore been included for reference purposes only.

Post Commissioning Noise Monitoring

- 7.3.11 ACCON note that that continuous noise monitoring should be undertaken for a period of at least one year, or possibly longer, at one sensitive receptor at least. Amec Foster Wheeler considers this approach overly conservative in terms of duration, and insufficient in determining compliance in terms of the number of monitoring locations.
- 7.3.12 In the event that noise compliance monitoring is required, it would include monitoring at four locations and its duration would be until such a time that a sufficient variation of wind speeds and directions had taken place, usually for approximately a one month period. The proposed methodology and survey duration would be in keeping with that advocated within the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise – Supplementary Guidance Note 5: Post Completion Measurements' (IoA GPG SGN5).

7.4 Revised Layout and Turbine Noise Level Data

7.4.1 The location of the 16 turbines comprising the Revised Layout are summarised in **Table 7.1**.

Table 7.1 Revised Layout Turbine Coordinates

Turbine Ref.	Easting	Northing	Turbine Ref.	Easting	Northing
T1	255563	607866	T9	256920	607348
T2	255934	608200	T10	257209	607066
T3	255716	607356	T11	257160	607685
T4	256142	606876	T12	257360	606678
T5	256373	608072	T13	257491	607348
T6	256490	607097	T14	257659	608057
T7	256621	606524	T15	256028	607726
T8	256651	607737	T16	256400	606200

Potential Receptors

7.4.2 Sensitive receptors around the Proposed Development considered within the noise assessment were identified through the use of OS maps, preliminary noise modeling and in consultation with the EHO. The locations considered within this assessment are the same as those considered within the section 36 application, and are listed in **Table 7.2**.

Table 7.2 Reassessed Noise Sensitive Receptors

Ref.	Receptor	Easting	Northing
R1	Meikle Hill	253500	608850
R2	Nith Lodge	253600	609270
R3	Maneigh	254277	609669
R4	Knockburnie	256231	610424
R5	Dalleagles	257292	610564
R6	Dalleagles Terrace	257682	610580
R7	Brockloch	259441	610532
R8	Laglaff	260210	610300

Proposed Development – Turbine Sound Power Levels

7.4.3 A range of turbine models would be appropriate for the Proposed Development. The final selection of turbine will follow a competitive tendering process and thus the actual model of turbine may differ from those upon which the assessment has been based. However, the final choice of turbine will be required to comply with the noise criterion levels which have been established for the Proposed Development within the noise assessment.

7.4.4 In order to reflect the range of commercially available turbines which would be appropriate for the Proposed Development, the noise predictions were based upon an 'assessment envelope', which results in predictions for a generic turbine. To achieve this, a range of commercially available

turbines were considered. The assessment envelope for this noise assessment was based on the greatest sound power level at each wind speed irrespective of turbine type. The assessment was therefore not based upon a particular candidate turbine as such, rather what can be considered a worst-case at each wind speed based upon a range of turbines potentially suitable for the Proposed Development.

- 7.4.5 The turbines considered within assessment envelope were: Siemens SWT 3.2-10; GE 3.2-103; and GE 2.85-103. Details of the sound power levels selected for each wind speed are given in **Table 7.3**.

Table 7.3 Proposed Development – Assessment Envelope Sound Power Levels

Candidate Turbine	Sound Power Levels dB L_{WA} at standardised 10m height wind speed (V_{10}) ms^{-1}									
	3	4	5	6	7	8	9	10	11	12
Siemens SWT 3.2-101*	93.0	97.2	101.8	106.5	108.5	109.0	109.0	109.0	109.0	109.0
GE 2.85-103*	94.4	94.9	99.1	104.1	107.0	107.0	107.0	107.0	107.0	107.0
GE 3.2-103 *	97.1	98.0	101.7	104.9	106.7	107.0	107.0	107.0	107.0	107.0
Assessment Envelope	97.1	98.0	101.8	106.5	108.5	109.0	109.0	109.0	109.0	109.0

* Sound Power Levels include additional +2dB uncertainty correction, as per guidance presented within IoA GPG.

- 7.4.6 The sound emitted by wind turbines consists of a number of different frequencies, some of which are more dominant than others. These frequencies are grouped together into what are known as octave band centre frequencies or spectra. Within each spectrum, the highest frequency is twice the lowest frequency and the octave bands are defined by the octave band centre frequency. The addition of these spectra gives an overall sound power level for the turbine. The amount of sound absorption over a given distance depends on the frequency of the noise - high frequency sound is absorbed more readily by the ground and atmosphere than low frequency sound.
- 7.4.7 The noise predictions were based upon the frequency spectrum for the GE 2.85-103 85m hub-height, as this is found to have the sound power spectrum with the largest amount of low frequency content, and thus would result in the highest comparable noise immissions at receptors. The spectrum was determined at a wind speed of $V_{10} = 8ms^{-1}$ as presented in **Table 7.4**. The spectrum was then scaled to the appropriate broadband sound power level detailed in **Table 7.3** to reflect the conservative levels derived from the assessment envelope, in order to carry out the predictions.

Table 7.4 Sound Power Levels – Frequency Spectrum

Candidate Turbines	Sound Power Levels at octave band centre frequency (Hz), dB L_{WA}							
	63	125	250	500	1k	2k	4k	8k
GE 2.85-103	90.2	94.7	96.0	97.4	99.0	99.1	92.8	73.1

Cumulative Developments – Turbine Sound Power Levels

- 7.4.8 In addition to considering the noise effects from the Proposed Development in isolation, cumulative noise predictions have been undertaken which account for the likely effects of the closest existing, consented and operational wind developments, as summarised in **Table 7.5** below.

Table 7.5 Cumulative Wind Developments

Wind Development Name	Status	Number of Turbines	Assumed Turbine Type
South Kyle*	Proposed	50	Assessment Envelope
Pencloe*	Proposed	21	Siemens SWT 3.2-101
Windy Standard	Operational	36	Nortank 0.6MW
Windy Standard Extension (Brockloch Rig)	Consented	30	Vestas V90 3MW
Afton*	Consented	27	NM80 2.75MW
Benbrack*	Proposed	18	Assessment Envelope
High Park Farm	Consented	1	Vestas V52 0.85MW

* Turbine sound power level taken from ES of the relevant development

7.4.9 The sound power levels assumed for the turbines within the cumulative noise assessment are detailed in **Table 7.6**. The sound power levels are presented for wind speeds between 3–12 ms⁻¹.

Table 7.6 Sound Power Levels for Cumulative Development Wind Farms

Cumulative Turbines	Sound Power Levels dB L _{WA} at standardised 10m height wind speed (V ₁₀) ms ⁻¹									
	3	4	5	6	7	8	9	10	11	12
South Kyle	100.2	100.2	103.6	107.1	108.5	109.0	108.7	108.5	108.5	108.5
Pencloe	101.6	101.6	106.3	108.5	109.0	109.0	109.0	109.0	109.0	109.0
Windy Standard*	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8
Windy Standard Extension (Brockloch Rig)	98.7	98.7	101.8	104.6	106.3	107.2	107.2	107.9	107.9	107.9
Afton	92.3	92.3	96.1	103.1	103.1	103.9	104.7	105.5	105.5	105.5
Benbrack	97.1	98.0	101.8	106.5	108.5	109.0	109.0	109.0	109.0	109.0
High Park Farm	96.0	96.6	99.2	103.4	105.9	106.4	106.8	105.7	104.9	104.5

* Sound Power Levels included additional +2dB uncertainty correction, as per guidance presented within the IoA GPG

7.4.10 The frequency spectrum assumed for the noise predictions of the cumulative wind developments is shown in **Table 7.7**. In each case, the frequency spectrum was determined at a wind speed of V₁₀ = 8ms⁻¹, and then scaled to the appropriate broadband sound power level, as detailed in **Table 7.6**.

Table 7.7 Sound Power Level Spectrum for Cumulative Development Turbines

Cumulative Turbines	Octave band centre Frequency (Hz), dB L _{WA}							
	63	125	250	500	1k	2k	4k	8k
South Kyle	94.0	96.1	99.2	101.6	103.8	102.5	98.7	88.7
Pencloe	89.4	95.8	99.7	101.5	104.5	102.6	96.5	82.9
Windy Standard	76.6	84.4	91.2	95.2	92.0	88.5	85.0	76.4

Cumulative Turbines	Octave band centre Frequency (Hz), dB L_{WA}							
	63	125	250	500	1k	2k	4k	8k
Windy Standard Extension (Brockloch Rig)	91.8	94.0	97.3	99.6	101.8	100.5	96.7	86.7
Afton	85.8	93.0	95.7	96.6	94.7	91.3	85.9	80.3
Benbrack	90.2	94.7	96.0	97.4	99.0	99.1	92.8	73.1
High Park Farm	80.7	88.6	94.4	100.0	99.7	95.8	89.4	79.2

7.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

- 7.5.1 Wind turbine noise levels have been predicted using the methodology set out within **Section 7.3** of the ES. The methodology is advocated within ETSU-R-97 Guidance: *The Assessment of Rating of Noise from Wind Farms* (1996) ("ETSU-R-97 Guidance") and the Institute of Acoustics (IoA) published 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' ("IoA GPG").
- 7.5.2 The individual contributions of each of the considered proposed, consented and operational wind developments at each of the assessed noise sensitive receptors listed in **Table 7.2** are detailed within FEI **Appendix 7.B**.
- 7.5.3 FEI **Appendices 7.C – 7.F** include the following information at each of the assessed noise sensitive receptors for the: daytime, night-time, daytime (cumulative) and night-time (cumulative), assessments respectively:
- ▶ Values of the quiet daytime amenity and night-time background noise curve at the integer wind speeds, measured and adjusted for wind shear (as detailed within the ES);
 - ▶ The daytime and night-time noise limits (derived using the methodology outlined within Section 7.3), for the Proposed Development operating in isolation, and for the cumulative assessment;
 - ▶ The predicted turbine noise levels from the Proposed Development (assessed in FEI **Appendix 7.C** and FEI **Appendix 7.D**) and the cumulative developments, listed in **Table 7.5** (assessed in FEI **Appendix 7.E** and **Appendix 7.F**) based upon the worst-case downwind noise propagation at receptors, assuming turbines are operating simultaneously and inclusive of a 'canyon effect' penalty, where applicable; and
 - ▶ The margin by which the predicted turbine noise (inclusive of any 'canyon effect' penalty) meets the noise limits for each of the four scenarios, at each wind speed using the worst-case downwind noise predictions (negative values indicate the predicted noise levels are lower than the noise limits).
- 7.5.4 It should be noted that the predicted turbine noise is the same for both the day and night-time periods and the assessments are presented separately to take account of the different daytime and night-time noise limits.
- 7.5.5 As shown in FEI **Appendix 7.C** and FEI **Appendix 7.D**, the predicted turbine noise levels based upon the turbine assessment envelope shown in **Table 7.3** do not exceed the associated daytime and night-time noise limits, therefore operational noise would not have a 'significant' effect upon the closest assessed receptors. The smallest daytime and night-time margins of 2.4 dB and 5.4 dB, respectively, are shown to occur at R3 – Maneight.

- 7.5.6 As shown in FEI **Appendix 7.E** and **7.F**, the predicted turbine noise levels from the Proposed Development when considered cumulatively with proposed, consented and operational wind developments, do not exceed the associated daytime and night-time noise limits. The smallest margins below the associated daytime and night-time cumulative noise limits are 3.5 dB and 6.5 dB, respectively, at R1 – Meikle Hill.

7.6 Evaluation of Residual Effects

- 7.6.1 No specific mitigation or enhancement measures are required for construction, decommissioning or operational noise and it is concluded that, as for the Original Layout, the Proposed Development will have no significant effects in relation to noise.

7.7 Conclusions

- 7.7.1 Based on the assessment outlined above, noise levels from the 16 turbine Proposed Development are predicted to meet the associated noise limits both when operating in isolation (as shown in FEI **Appendix 7.C** and FEI **Appendix 7.D**) and cumulatively with submitted, consented and existing wind developments (as shown in FEI **Appendix 7.E** and **7.F**). Consequently, no significant adverse noise impacts are anticipated to arise from the Revised Layout.
- 7.7.2 Proposed noise limits, suitable for a condition, at the closest noise sensitive receptors are included within FEI **Appendix 7.A**.

8. Shadow Flicker

8.1 Introduction and Overview

- 8.1.1 The Specific Advice Sheet Onshore Wind Turbines (2014), which forms national planning guidance, states that '*shadow flicker should not be a problem*' at receptors more than 10 rotor diameters from turbine locations.
- 8.1.2 There are no residential dwellings within 1,110m (10 rotor diameters including 50m micro-siting allowance) of the revised turbine locations. The conclusion of the ES therefore remains valid, i.e. that no properties would experience significant shadow flicker effects. The issue of shadow flicker need not therefore be considered in detail in this chapter.

8.2 Changes to Policy and Legislative Context

- 8.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application. There have been no changes to policy and legislation of relevance to this FEI chapter.

8.3 Application Consultation Responses

- 8.3.1 None of the consultation responses received by LECU in response to the section 36 application contained any comments applicable to shadow flicker.

8.4 Implications of Revised Layout

- 8.4.1 As per the original 19 turbine layout, no residential properties lie within the study area, i.e. a distance of 1,110m (10 rotor diameters, plus a 50m micro-siting allowance) and 130 degrees either side of north from the Revised Layout as shown on **Figure 8.1**.

8.5 Shadow Flicker Predicted Effects

- 8.5.1 No shadow flicker effects are predicted as no residential properties lie within 10 rotor diameters (plus a 50m micro-siting allowance) and 130 degrees either side of north from the proposed turbine locations.

8.6 Evaluation of Residual Effects

- 8.6.1 No shadow flicker effects are predicted. As such there is no requirement for any mitigation measures; no residual effects are predicted during the operation of the Proposed Development.

8.7 Conclusions

- 8.7.1 The conclusions of the Enoch Hill Wind Farm ES remain valid.

8.8 References

- 8.8.1 Refer to **Chapter 8** of the ES.



9. Landscape and Visual

9.1 Introduction

- 9.1.1 Landscape and Visual Impact Assessment (LVIA) for wind farms forms one of the key components of the EIA process to comply with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as relevant and amended and hereinafter referred to as the 'EIA Regulations'). This allows consideration of the Proposed Development (Enoch Hill Wind Farm as revised) against relevant planning policies, relating to landscape resource and visual amenity.
- 9.1.2 The Proposed Development is located approximately 5km southwest of New Cumnock, within East Ayrshire. The Proposed Development has been revised in response to consultation comments received from East Ayrshire Council (EAC) and Scottish Natural Heritage (SNH) to improve the design and visual composition, as it would be seen from the surrounding landscape and in particular, locations in and around New Cumnock and the Upland Basin of the River Nith. In comparison with the Original Layout, the Revised Layout has a reduction in the land take from ~14.23ha to ~13.06ha and the reduction in the total number of turbines from up to 19 to up to 16.
- 9.1.3 A summary of the revised Proposed Development and associated infrastructure are summarised as follows:
- ▶ Up to 16 No. three-bladed, horizontal axis wind turbines (up to a maximum blade tip height of 130m) including concrete turbine foundations, and associated crane pads at each location;
 - ▶ 2 No. anemometer mast, 80m in height and associated crane pads at each location;
 - ▶ A wind farm control building and compound, and a SPEN Substation;
 - ▶ New Development Site access and internal access tracks, including passing places and 5 culverts (watercourse crossings);
 - ▶ Underground cabling in cable trenches; and
 - ▶ During the construction period a temporary construction compound and concrete batching plant would be required. Up to 2 borrow pit search areas (reduced from 3) are located within identified search areas.
- 9.1.4 Construction, operation and decommissioning are anticipated to cover a period of up to 27 years in total, 25 years of which would be for the operation of the wind farm.

Chapter Structure

- 9.1.5 The chapter is structured as follows:
- ▶ Section 9.1 Introduction;
 - ▶ Section 9.2 Consultation and Scope of Assessment;
 - ▶ Section 9.3 Methodology;
 - ▶ Section 9.4 Revised Baseline Description;
 - ▶ Section 9.5 Revised Zone of Theoretical Visibility (ZTV) and Viewpoint Analysis;
 - ▶ Section 9.5 Design Statement and Mitigation;
 - ▶ Section 9.6 Revised Residual Landscape Effects;
 - ▶ Section 9.7 Revised Residual Visual Effects;
 - ▶ Section 9.8 Summary of Revised Residual Landscape and Visual Effects;

- ▶ Section 9.9 References;
- ▶ Appendices (contained within Volume 3):
 - ▶ Appendix 9.A: Landscape Design Statement;
 - ▶ Appendix 9.B: Viewpoint Analysis;
 - ▶ Appendix 9.C: Residential Visual Amenity Assessment;
 - ▶ Appendix 9.D: Additional Landscape Character Survey Sheets; and
 - ▶ Appendix 9.E: Cumulative Wind Energy Development.

9.1.6 A number of figures are provided to illustrate this chapter and they are contained within Volume 2 and include plans and visualisations of the Proposed Development.

9.2 Consultation and Scope of Assessment

9.2.1 Consultation responses to the LVIA in Chapter 9 of the ES were received from SNH and EAC and these comments have been used to assist and contribute to the re-design and assessment process.

9.2.2 The scope and geographical extent of the FEI LVIA has been limited to landscape receptors within 5km and visual receptors within 10km of the Proposed Development as a result of the consultation advice. Landscape and visual receptors previously assessed as less than moderately affected in the ES, and not subject to further consultation have been noted, but excluded from further revised assessment within the FEI.

9.2.3 Consultation comments from each of these consultees are noted as follows.

East Ayrshire Council

9.2.4 As part of the consultation process undertaken by the LECU, Ironside Farrar Ltd were commissioned by EAC to undertake a review of the LVIA set out in ES **Chapter 9**. The subsequent report ("*Enoch Hill Wind Farm, Audit of Landscape and Visual Impact Assessment*" Ironside Farrar Ltd, January 2016) noted, on page 17 that "*the LVIA is a comprehensive appraisal*".

9.2.5 The audit agreed with the proposed design objectives set out in the ES and subsequent advice from consultation with SNH and EAC has led to changes to the design and layout of the Proposed Development to ensure that it more closely reflects the design objectives. Further viewpoint analysis and site survey has been conducted and there has been alteration to the presentation of cumulative effects, ensuring that the distinction between primary, standalone, additional and combined cumulative effects of the Proposed Development is made clearer. The assessment has focused on the following aspects in particular which were raised by the audit:

- ▶ Landscape Character Effects:
 - ▶ Effects on the Southern Uplands and Southern Uplands with Forestry; and
 - ▶ Effects on the Upland Basin.
- ▶ Visual Effects:
 - ▶ Effects on the view from Cumnock and New Cumnock; and
 - ▶ Effects on the view from Auchenroy Hill.

Table 9.1 Summary of EAC Consultation Comments

Summary of EAC Consultation Comments	Summary of FEI Response
1. Illustrated Viewpoints	
<ul style="list-style-type: none"> ▶ Over-representation of distant viewpoints. ▶ No viewpoint from Cumnock and only one in vicinity of New Cumnock. ▶ VP16 on the A70 could be relocated to avoid an existing spoil heap. 	<ul style="list-style-type: none"> ▶ All of the ES viewpoints were selected in consultation with EAC and SNH. ▶ An additional viewpoint (FEI Figure 9.49a/b/c) illustrates the view from a high point in Cumnock on Drumbrochan Road. ▶ Further viewpoints are illustrated in and around New Cumnock as part of the A76 and the B741 sequential assessment illustrated in FEI Figures 9.24a-l and 9.25a-f. ▶ The location of VP16 was reconsidered, however in the interests of health and safety (avoiding stopping on busy roads and corners to take photographs) the existing viewpoint was retained as it is accompanied by a wireframe that is representative of the view without the screening. ▶ A further viewpoint is also illustrated in FEI Figure 9.59a/b/c from Little Garclaugh on the north western edge of the Upper Nith Valley.
2. Cumulative Assessment Methodology	
<ul style="list-style-type: none"> ▶ Although noted as 'logical' the audit questioned if the assessment clearly distinguished between the cumulative effects of the Proposed Development and what it terms the 'primary' effects. 	<ul style="list-style-type: none"> ▶ The ES assessment did set out separately the different levels of effect posed by the 'standalone' development and cumulative development in accordance with the SNH guidance. It is considered that the auditors have misunderstood the assessment in this regard. ▶ Whilst the terminology used in the audit is not promoted by SNH guidance, the FEI has adopted the use of the term 'primary' effects to ensure a greater level of understanding and clarity in the revised assessment as set out in this chapter (paragraph 9.2.7).
3. ZTV	
<ul style="list-style-type: none"> ▶ The auditors have suggested that a larger scale hub height ZTV should be provided. 	<ul style="list-style-type: none"> ▶ Comparison of the blade tip and hub height ZTVs reveals little difference in extent of coverage within 10km (comparing FEI Figures 9.2 and 9.3). Whilst FEI Figure 9.4a (and 9.5a/b) provide a larger scale or more detailed blade tip ZTV, Figure 9.4b provides an additional blade tip ZTV which allows for the effects of forestry within 10km and further assists in defining the extent and location of any likely significant effects.
4. Viewpoint Assessment	
<ul style="list-style-type: none"> ▶ The audit considers that "<i>some significant effects may arise at distances up to approximately 10km</i>". Only one receptor is identified in this respects, at the summit of Auchenroy Hill (Viewpoint 11, FEI Figure 9.37a/b/c/d). ▶ The auditors considered that the magnitude of change would be Low to Medium and the level of effect, although Moderate would be significant. In this case, there is little disagreement between the two assessments. 	<ul style="list-style-type: none"> ▶ The FEI assessment as set out in Table 9.6 and FEI Appendix 9.B confirms that significant primary visual effects would be limited to receptors within approximately 7km of the revised turbine locations.

Summary of EAC Consultation Comments	Summary of FEI Response
<ul style="list-style-type: none"> ▶ Viewpoint 11: Auchenroy Hill: ▶ It should be noted that in Appendix 1 of the Audit there is only one of the 22 viewpoint assessments with which the auditors disagree (Viewpoint 11: Auchenroy Hill). ▶ The auditors considered that the visual effects from Viewpoint 11: Auchenroy Hill would be Moderate and significant (High sensitivity and Low to Medium magnitude). 	<ul style="list-style-type: none"> ▶ Revised visualisations from Viewpoint 11: Auchenroy Hill are illustrated in FEI Figure 9.37a/b/c/d. ▶ The FEI assessment has reconsidered this viewpoint, judging it in line with other similar viewpoints at similar distances as well as noting the principle views, the 360° nature of the visibility and other cumulative wind energy development. ▶ The ES, the FEI assessment and the auditors all agreed that the level of effect would be Moderate (High sensitivity and Low to Medium magnitude). There is little disagreement between the two assessments. ▶ The FEI concludes that revised assessment would be Moderate and not significant as set out and explained in FEI Appendix 9.B.
5. Cumulative Viewpoint Assessment	
<ul style="list-style-type: none"> ▶ At VPs 4, 5, 6 and 7, significant cumulative effects are attributed to multiple windfarms, but the contribution of the Proposed Development would also be significant from these locations. 	<ul style="list-style-type: none"> ▶ ES Appendix 9.B explicitly set out the cumulative effects attributed to the Proposed Development and each wind farm visible from each viewpoint and only used the term 'multiple wind farms' as a summary term. The contribution of the Proposed Development to the cumulative level of effect recorded clearly is set out in each assessment.
6. Wind farm Appearance	
<ul style="list-style-type: none"> ▶ The auditors approved of the proposed design objectives. ▶ Viewed from the more sensitive northerly viewpoints, the design objectives – the appearance of a simple, rational and cohesive design - and how a clustered layout has been adopted, are considered not to have been met. 	<ul style="list-style-type: none"> ▶ The Revised Layout and design of the Proposed Development has further considered the visual appearance of the Proposed Development in relation to the design objectives. ▶ It is now considered that, with the improvements to the visual composition of the Proposed Development, viewed from various assessment locations, it is clear that it meets the proposed design objectives.
7. Landscape Assessment – Southern Uplands / Southern Uplands with Forestry	
<ul style="list-style-type: none"> ▶ The auditors state that they are 'unconvinced' by the ES local landscape character assessment that moves the boundary of the Southern Uplands / Southern Uplands with Forestry 2km northwards, to encompass the area where the majority of the turbines would be located. 	<ul style="list-style-type: none"> ▶ This aspect of the assessment has been revisited and three additional survey points and records have been provided in FEI Appendix 9.D. ▶ The revised local landscape character assessment has been undertaken in accordance with guidance set out in GLVIA 3 and SNH and locally adjusts the boundary of the landscape character up to 1.5km north. ▶ The East Ayrshire Wind Farm Landscape Capacity Study, upon which it is based, is noted to be undertaken at a larger scale. In addition, the distinctions between difference landscape character areas is seldom limited to a line on a map and more commonly involves a transition.
8. Landscape Assessment – Upland Basin	
<ul style="list-style-type: none"> ▶ The auditors noted agreement with the overall moderate adverse landscape effect, but the assessment is suggestive of a significant adverse effect to the southern parts of the basin. 	<ul style="list-style-type: none"> ▶ The detailed assessment set out in the ES (Chapter 9, tables 9.8 and 9.16) reports a Moderate landscape effect that would not be significant. The ES however, also reports significant visual effects on the views from the Upland Basin landscape character.

Summary of EAC Consultation Comments	Summary of FEI Response
9. Cumulative Landscape Effects	
<ul style="list-style-type: none"> ▶ The auditors considered that the contribution of the Proposed Development to cumulative effects was not clearly expressed. 	<ul style="list-style-type: none"> ▶ As noted in response to points 2 and 5 within this table, this aspect of the revised assessment has been reconsidered.
10. Visual Effects on New Cumnock	
<ul style="list-style-type: none"> ▶ Visibility from New Cumnock is understated. Viewpoints towards the north of the settlement should have been provided. 	<ul style="list-style-type: none"> ▶ As noted in response to point 1, further viewpoints were and are illustrated in and around New Cumnock as part of the A76 and the B741 sequential assessment illustrated in FEI Figures 9.24a-l and 9.25a-f. These supplementary viewpoints have been used as part of the revised FEI assessment.
11. Visual Effects on Cumnock	
<ul style="list-style-type: none"> ▶ SNH and EAC had requested the effects on Cumnock be assessed, but no viewpoint was included in the assessment. 	<ul style="list-style-type: none"> ▶ As noted in response to point 1 a new viewpoint (FEI Figure 9.49a/b/c) has been provided, illustrating the view from a high point in Cumnock on Drumbrochan Road.
12. Effects on Residential Properties	
<ul style="list-style-type: none"> ▶ The auditors claimed some inaccuracies in the assessment and concluded that some significant effects would be likely from some of the assessed properties. However, they also concluded that none of the effects are likely to be unacceptably overbearing in terms of residential visual amenity. 	<ul style="list-style-type: none"> ▶ The revised Residential Visual Amenity Assessment (FEI Appendix 9.C) has reassessed each of the properties, addressing all of these concerns. It concludes that there would be no significant visual effects experienced from any of these properties under the terms of its assessment.

Scottish Natural Heritage

- 9.2.6 SNH also provided a consultation response on landscape matters. SNH advised that the *“Enoch Hill Wind Farm would be likely to result in significant cumulative and landscape impacts”*, a conclusion which accords with the stated results of the LVIA as reported in the ES. SNH have not objected to the Proposed Development.
- 9.2.7 In particular, SNH commented on the design and the potential for cumulative landscape effects on the Southern Uplands / Southern Uplands with Forestry and views from the Upland Basin. SNH expressed the view that there is a potential for the scheme to further ‘encircle’ the settlements of New Cumnock and Dalmellington.
- 9.2.8 The assessment has therefore focused on the following aspects raised by SNH:
- ▶ Landscape Character Effects:
 - ▶ Intensification of cumulative wind energy development in the Southern Uplands and Southern Uplands with Forestry; and
 - ▶ Enclosing effects on the Upland Basin.
 - ▶ Visual Effects:
 - ▶ Effects on the views from New Cumnock and Dalmellington and whether these settlements may be perceived as ‘encircled’ by large scale wind energy development.

9.2.9 A summary of the consultation comments contained in the EAC and SNH audits and how they have been addressed as part of this assessment is set out in **Tables 9.1** and **9.2**.

Table 9.2 Summary of SNH Consultation Comments

Summary of SNH Consultation Comments	Summary of FEI Response
1. Summary: the Proposed Development would be likely to result in significant cumulative landscape and visual impacts.	<ul style="list-style-type: none"> ▶ All large scale wind farm development is likely to result in significant cumulative landscape and visual impacts. ▶ The FEI presents an updated LVIA of the Revised Layout.
2. The Proposed Development would further intensify wind energy development in this part of the Southern Uplands and would extend turbines across and along the shoulder of the hills and down the northern slopes.	<ul style="list-style-type: none"> ▶ The ES noted that the Proposed Development would further intensify wind energy development in this part of the Southern Uplands / Southern Uplands with Forestry. ▶ The Revised Layout has gone further in seeking to avoid placing turbines on the shoulder of the hills and down the northern facing slopes, although it cannot avoid visibility on the horizon.
3. The Proposed Development would further enclose the low-lying, settled landscape of the Upland Basin and intrude on sensitive views.	▶ The FEI has considered this further and concludes that the Proposed Development would not 'enclose' the settled landscape of the Upland Basin in combination with other existing and consented wind farms and other known wind energy applications.
4. The Proposed Development would further encircle settlements at the north western edge of the Southern Uplands, including New Cumnock and Dalmellington, with large scale wind energy development.	▶ The FEI has considered this further and concludes that the Proposed Development would not 'encircle' settlements including New Cumnock and Dalmellington in combination with other existing and consented wind farms and other known wind energy applications.
5. The Proposed Development would be seen as a complex and poorly designed wind farm in sensitive views from the north.	▶ The original layout was subject to a number of design constraints and should not be regarded as 'poorly designed' in that context. As noted in response to EAC point 6, the Proposed Development has been re-designed.

9.3 Methodology

9.3.1 The LVIA and cumulative assessment (CLVIA) reported in this chapter have been based on the same methodology as set out in ES Volume 3: **Appendix 9.A** and conforms to the Guidelines for Landscape and Visual Impact Assessment (GLVIA) 3rd Edition, Landscape Institute and IEMA, May 2013.

9.3.2 The assessment has been produced by chartered landscape architects at Amec Foster Wheeler, Environment and Infrastructure UK Ltd (Amec Foster Wheeler).

9.3.3 The objective of this revised assessment has been to determine the landscape and visual effects of the Proposed Development on the existing landscape resource and visual amenity taking account of the Revised Layout. The following landscape and visual receptors have been assessed:

- ▶ Landscape character, key characteristics, and elements;
- ▶ Designated landscapes; and
- ▶ Views and visual amenity experienced by residents, tourists, visitors, recreational and road users.

9.3.4 The assessment process has encompassed the construction, operation, and decommissioning of the Proposed Development and has included design iteration and re-assessment of the residual effects. The process has sought to achieve an acceptable compromise between efficient energy

capture, environmental considerations and achieving an acceptable design in terms of landscape and visual effects.

Assessment Parameters

- 9.3.5 The LVIA and cumulative assessment has assessed the Proposed Development on the basis of the Revised Layout, comprising a maximum 16 wind turbines with a maximum height of up to 130m to blade tip. ZTV plots and visualisations have been prepared on the basis of a generic turbine model comprising an 80m hub height and a 100m rotor diameter, with an overall blade tip height of up to 130m. It is considered that these assessment parameters would demonstrate the 'worst case' of likely significant landscape and visual effects as required by the EIA process. Whilst a slight alteration to the hub height or rotor diameter, within the overall blade tip limit of 130m is unlikely to alter the conclusions of the LVIA, a change to the hub height or rotor diameter could slightly alter the visual proportions of the wind turbine, with a larger rotor diameter making the turbines appear either slightly 'broader' and / or slightly reducing the overall impression of height. In accordance with SNH guidance on the *Siting and Designing of Wind Farms in the Landscape* (May 2014) there is no visual preference or 'worst case' regarding these parameters and individual opinions will vary. Pre-construction and during procurement, approval of the selected turbine model would be sought from the local planning authority and the exact hub height and rotor dimensions may vary within the overall maximum blade tip height of up to 130m.
- 9.3.6 In addition, the location of the proposed turbines has been assessed on the basis of the final wind turbine layout, which would normally be subject to a micrositing condition of up to +/-50m. The landscape architects conducting this study have tested the clustered turbine layout and can also confirm that the turbine micrositing would lead to no change to the magnitude and level of any effect reported in the LVIA.

Defining the Study Area

- 9.3.7 There has been no change to the LVIA Study Area used for the revised assessment, which remains as illustrated in FEI **Figure 9.1**, Volume 2.

Landscape Planning Policy and Guidance

- 9.3.8 FEI **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 9.3.9 At the national level there have been no changes to national planning policy, advice and guidance since the submission of the section 36 application of relevance to this FEI Chapter.
- 9.3.10 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of 'largely binding' modifications to the East Ayrshire LDP Proposed Plan (2015). The LVIA process has taken into account relevant national and local planning policy requirements, as outlined in **Chapter 5 – Planning Policy Context** of the ES and FEI and Chapter 9 of the ES. The revised assessment presented in this FEI Chapter has also taken account of the following draft consultation documents relating to wind energy development in Dumfries and Galloway.
- ▶ Dumfries and Galloway Consultation Draft Local Development Plan (LDP) Part 1 Wind Energy Development: Development Management Considerations Supplementary Guidance; and
 - ▶ Dumfries and Galloway Wind Farm Landscape Capacity Study – Consultation Report: September 2016.

Landscape and Visual Impact Assessment

- 9.3.11 Essentially, the landscape and visual effect (and whether it is significant) is assessed by considering the landscape or visual sensitivity to the Proposed Development, with reference to the susceptibility and value of the receptor against the magnitude of change, in order to identify a level of effect that would be brought about by the Proposed Development, were it to be implemented. The level of effect is also described in terms of its scale, geographical extent and duration. It is subsequently assessed whether the effect would be significant in terms of the EIA Regulations.
- 9.3.12 Taking account of consultation comments from EAC and their consultants, the LVIA has been set out to consider the following 'primary' and 'cumulative' aspects of the Proposed Development as follows:
- ▶ Primary Effects:

These consider the effects of the Proposed Development on a 'standalone' basis, although in practice the Proposed Development would be located within a contemporary, rural scene where other wind farm development is already present;
 - ▶ Cumulative Effects (Level of Effect 1):

The cumulative effects of the Proposed Development in combination with other existing / under construction and consented wind energy development are reported.
 - ▶ Cumulative Effects (Level of Effect 2):

The cumulative effects of the Proposed Development in combination with other existing / under construction and consented wind energy development, as well as known wind energy applications are reported.
 - ▶ Additional Effects:

The additional effects of the Proposed Development, 'in addition' to the existing / under construction and consented wind energy development, as well as known wind energy applications are reported, allowing for the fact that that some of those developments already exist in the landscape.
- 9.3.13 The assessment process has involved iterative design and re-assessment of any remaining, residual effects that could not otherwise be mitigated or 'designed out'.
- 9.3.14 The time period for the assessment covers phases of development related to the construction of the Proposed Development and associated infrastructure, its operation for a period of 25 years, and decommissioning.
- 9.3.15 The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The assessment has also considered the cumulative effects resulting from the Proposed Development in combination with other existing and consented wind farms, as well as known wind farms at the planning application stage.
- 9.3.16 The LVIA unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.
- 9.3.17 In accordance with the relevant EIA Regulations, it is important to determine whether the predicted effects, resulting from the Proposed Development, are, in the assessor's opinion likely to be significant. Significant landscape and visual effects relate to all those effects that result in a 'Substantial' or a 'Substantial / Moderate' effect as indicated in **Table 9.3**. In some circumstances, 'Moderate' levels of effect also have the potential, subject to the assessor's opinion, to be considered as significant and these exceptions are explained as part of the assessment, where they occur.
- 9.3.18 Wind turbines and wind farm developments are by their nature tall, visible structures and the Scottish Government's web-based Planning Advice Note (PAN) on Onshore Wind Turbines (May

2014) notes the height of wind turbines as up to “140-150m high” which would unavoidably result in significant effects. However that does not mean that a wind farm proposal should automatically be considered unacceptable and consent refused. Rather, the decision makers will then consider the project overall, in terms of the relevant development plan and Government policy such as NPF3 and SPP 2014.

Table 9.3 Evaluation of Landscape and Visual Effects

Magnitude of Change	Landscapes and Visual Sensitivity			
	High	Medium	Low	Negligible
High	Substantial	Substantial / Moderate	Moderate	Slight
Medium	Substantial / Moderate	Moderate	Slight	Slight / Negligible
Low	Moderate	Slight	Slight / Negligible	Negligible
Negligible	Slight	Slight / Negligible	Negligible	Negligible
Zero	None / No View	None / No View	None / No View	None / No View

Shaded Cell = Significant in terms of EIA Regulations.

Unshaded cell = Not significant in terms of EIA Regulations (see text in paragraph 9.3.16 in relation to exceptions).

Cumulative Wind Energy Development

- 9.3.19 Other wind energy development included in the revised CLVIA, has been updated from the ES and includes those wind energy developments within the 35km radius Study Area as listed in FEI **Appendix 9.E** and illustrated in **Figures 9.6** and **9.7**, Volume 2.
- 9.3.20 Drawing from the search area and consultation advice from SNH and EAC, the following wind energy developments have been included in the CLVIA:
 - ▶ All operational, consented and planning application projects above 50m to tip height within 35km; and
 - ▶ Micro-generation turbines between 25m and 50m to blade tip height have been included within 10km of the Proposed Development.
- 9.3.21 In accordance with the SNH guidance, projects at the scoping stage have not been included in the CLVIA, although their locations are noted on FEI **Figure 9.6b** where known.
- 9.3.22 Wind energy development included within the CLVIA was collected from local planning authority and developer sources in August 2016. Subsequent to completion of the assessment a further review of the cumulative data was undertaken within 35km of the Development Site.
- 9.3.23 A summary of the changes to the baseline cumulative information on other wind energy development included in the assessment has been provided in **Tables 9.4** and **9.5**. The identification number in the table relates to that used in the figures with ‘E’ referring to existing wind energy development, ‘C’ referring to consented wind energy development and ‘A’ referring to applications for wind energy development.

Table 9.4 Changes to Cumulative Wind Energy Development since the ES

Name	Turbine numbers	Approximate Distance	Change in Status from the ES in August 2015
Assessed as Existing Wind Energy Development			
E05. Sunnyside	2 turbines	19km	Progressed from Consented to Existing
E07. Dungavel	13 turbines	30km	Progressed from Consented to Existing
Currently assessed as Consented Wind Energy Development			
C03. Taiglim Farm	1 turbine	8km	Progressed from Application to Consented
C06. Sanquhar 'Six'	6 turbines	10km	Progressed from Scoping to Consented
C10. Glenmuckloch	8 turbines	15km	Progressed from Scoping to Consented
C14. Linburn Farm	2 turbines	24km	Progressed from Application to Consented
C16. Kennoxhead	26 turbines	26km	Progressed from Application to Consented
C19. Stoneyhill Farm	1 turbine	30km	-
C21. Cumberhead Wind Farm (Nutberry Extension)	16 turbines	30km	Progressed from Scoping to Consented
C22. Kype Muir Extension	18 turbines	31km	-
C26. Hallburn Farm	1 turbine	36km	-
C27. Dalquhandy	15 turbines	34km	-
C30. Monchrum Fell	11 turbines	35km	Progressed from Application to Consented
Currently assessed as Application Wind Energy Development			
A04. Windy Rig	16 turbines	8km	Progressed from Scoping to Application
A07. Lorg	15 turbines	11km	Progressed from Scoping to Application
A08. Sandy Knowe	24 turbines	12km	Revised Application
A12. Longburn	10 turbines	15km	Revised Application
A15. Wether Hill Extension	11 turbines	17km	Progressed from Scoping to Application
A16. Linfairn	17 turbines	20km	Progressed from Scoping to Application
A17. Knockskae	11 turbines	21km	Progressed from Scoping to Application
A21. Loch Hill	8 turbines	24km	Revised Application
A22. Bankend Rig II (Bankend Rig Extension)	3 turbines	26km	Progressed from Scoping to Application
A23. Hadyard Hill Extension	31 turbines	27km	-
A26. Alton Muirhouse Farm	2 turbines	32km	Progressed from Scoping to Application
A27. Balunton Hill	9 turbines	33km	Progressed from Scoping to Application
A28. Douglas West	15 turbines	34km	Progressed from Scoping to Application

9.3.24 A number of wind energy development applications, previously included in the cumulative assessment have since been refused or withdrawn as set out in **Table 9.5**¹.

¹ It has been noted that the Keirs Hill application has been refused since the completion of this assessment.

Table 9.5 Wind Energy Development excluded from the Cumulative Assessment

Name	Turbine numbers	Approximate Distance	Status in August 2016
Applications Withdrawn / Refused and not subject to Appeal			
High Cumnock	8 Turbines	9km	Appeal Dismissed
Quantans Hill	19 turbines	12km	Withdrawn (revised scheme at Scoping stage and as such is excluded from the CLVIA)
Glenmount	19 turbines	12km	Withdrawn
Spango	14 turbines	20km	Refused
Loch Urr	26 turbines	28km	Withdrawn
Leadhills (Windy Dod)	14 turbines	30km	Refused
Burnfoot Farm	1 turbine	32km	Withdrawn
Coldwakening	1 turbine	32km	Consented turbine now <50m BT so excluded from CLVIA
Bloomsfield Farm	1 turbine	34km	No Data Available

9.4 Zone of Theoretical Visibility and Viewpoint Analysis

- 9.4.1 The ZTV and viewpoint analysis has been repeated to assess the Revised Layout and the results are reported here and in FEI **Appendix 9.B**.
- 9.4.2 The ZTV was calculated using ReSoft WindFarm computer software to produce an area of potential visibility of any part of the proposed wind project, calculated to turbine blade-tip and hub-height. The ZTV however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits of the visual assessment Study Area. As a result there may be roads, tracks, and footpaths in the wider setting which, although shown as falling within the ZTV, have restricted viewing opportunities since they are heavily screened or filtered by banks, walls, and vegetation. The ZTVs therefore provide a starting point in the assessment process and accordingly tend towards giving a 'worst-case' or over-estimated impact scenario of the potential visibility of the turbines.
- 9.4.3 The ZTV maps indicate the areas from where it may be theoretically possible to view all or some of the wind turbines which form part of the Proposed Development, calculated to the maximum height of up to 130m to blade tip, based on the hub heights of 80m and a rotor diameter of 100m. A number of revised ZTV maps illustrated in Volume 2 have been provided as follows:
- ▶ Figure 9.2: illustrates the ZTV calculated to blade tip at 1:300,000 scale across the LVIA Study Area and provides an overview of the theoretical extent of visibility;
 - ▶ Figure 9.3: illustrates the ZTV calculated to hub height at 1:300,000 across the LVIA Study Area with viewpoints;
 - ▶ Figure 9.4a: illustrates the detailed ZTV calculated to blade tip at 1:50,000 out to 10km with cumulative wind farm development;
 - ▶ Figure 9.4b: illustrates the detailed ZTV calculated to blade tip at 1:50,000 out to 10km with cumulative wind farm development, and allowing for the screening effects of forestry;
 - ▶ Figure 9.5a: (A0 fold-out) illustrates the ZTV calculated to blade tip at 1:100,000 scale across the LVIA Study Area; and

- ▶ Figure 9.5b: (A0 fold-out) illustrates the detailed ZTV calculated to blade tip at 1:50,000 scale out to 20km.

Zone of Theoretical Visibility (ZTV) Analysis

- 9.4.4 As expected, the Revised Layout has had little effect on the theoretical extent of visibility illustrated in each of the ZTVs. Total ZTV (to blade tip) coverage would account for approximately 28% of the LVIA Study Area and ZTV (to hub height) coverage accounts for approximately 24.6% of the LVIA Study Area, with no discernible change to the figures reported in the ES (**Chapter 9**).
- 9.4.5 The extent of ZTV coverage is reduced from 62.4% to 38.9% of the Study Area within 10km, when the screening effects of forestry are accounted for as illustrated in FEI **Figure 9.4b**.
- 9.4.6 Within 10km, the ZTV coverage is largely focused to the north and northwest of the Proposed Development. Much of this theoretical visibility is within the Upland Basin landscape character type and includes some large areas of active open-cast mining, although it is also present along stretches of the A76 and the outer western edges of the settlement of New Cumnock. There is no theoretical visibility of the Proposed Development within the Glen Afton Valley except for the western facing slopes above the valley to the east of Blackcraig Hill and Hare Hill. Fragmentary theoretical visibility is present to the south of the Proposed Development across elevated summits within the Carsphairn Forest.

Cumulative Zone of Theoretical Visibility (ZTV) Analysis

- 9.4.7 The locations of other wind energy development within the 35km radius Study Area are illustrated in FEI **Figures 9.6 and 9.7**. Further cumulative ZTV maps are illustrated in FEI **Figures 9.8a to 9.15** indicating the extent of theoretical cumulative visibility in relation to the Proposed Development and other existing, consented and application wind farms.
- 9.4.8 The revised cumulative ZTVs however, demonstrate little or no change to the cumulative theoretical extent of visibility illustrated in each of the ZTVs in comparison to the equivalent figures in the ES.

Viewpoint and Cumulative Viewpoint Analysis

- 9.4.9 The viewpoint analysis has been conducted from the same 22 locations used for the ES and 2 additional viewpoints, as illustrated in FEI **Figure 9.26**. The additional viewpoint locations are listed as follows:
- ▶ Viewpoint A: Drumbrochan Road, Cumnock (added as a result of post application consultation); and
 - ▶ Viewpoint B: Little Garclaugh, Upper Nith Valley (added as a result of post application consultation).
- 9.4.10 The views from these locations are illustrated at a 90° and a 53.5° angle or field of view (FoV) in FEI **Figures 9.27a/b/c/d to 9.50a/b/c/d/e**, with wireframes and photomontages for those viewpoints within 15km of the Proposed Development. A further 5 of these viewpoints are illustrated as 360° viewpoints in FEI **Figures 9.55a/b/c/d/e**.
- 9.4.11 Cumulative wind farm development (as updated in **Table 9.4** and FEI **Appendix 9.E**) that would be visible within 35km of each viewpoint has been illustrated in the wireframes.

Geographical Extent of Potentially Significant Visual Effects

- 9.4.12 The viewpoint analysis indicates that the primary significant visual effects would extend out in a north and northeast direction, primarily affecting views from the Upland Basin, including open views from the A76 and the south western edge of New Cumnock within approximately 7km from the nearest turbine locations, as indicated by Viewpoints 1, 2, 4, 5, 6 and 7 (FEI **Figures 9.27, 9.29-9.32**).

- 9.4.13 The views in other directions to the east, south and southwest would not be significantly affected due to the intervening landform and forestry. Visual effects for the two additional viewpoints at Cumnock and in the Upper Nith Valley (VPs A and B) would similarly not be significantly affected.
- 9.4.14 The Proposed Development has also been considered in terms of the 'additional' and 'combined' cumulative visual effects with other existing, consented and application wind farms. The analysis indicates that the 'additional' effect of adding the Proposed Development to the existing, consented and applications baseline of other wind energy development would also be significant from Viewpoints 1, 2, 4, 5 and 7. In terms of combined cumulative effects, the Proposed Development would contribute to the significant cumulative effects likely to be viewed from Viewpoint 8: Cairnmore of Carsphairn as a result of multiple wind farm development, most notably the South Kyle proposal.
- 9.4.15 Although there is little change to the predicted levels of effect resulting from the Revised Layout in comparison to the Original Layout, there has been a notable improvement to the design composition which is most notable from those viewpoints within the Upland Basin, likely to be most affected. These improvements are described further in the Landscape Design Statement (FEI **Appendix 9.A**) and FEI **Chapter 9**, but are also noted in the detailed viewpoint analysis for each viewpoint in FEI **Appendix 9.B** where relevant. The Revised Layout results in a more simple and cohesive layout / visual composition with fewer turbine stacking / gaps or outlying turbines appearing from the viewpoints, in line with SNH guidance (Scottish Natural Heritage, Siting and Designing Wind Farms in the Landscape, Version 2, May 2014) and post application consultation comments.
- 9.4.16 The predicted levels of effect are indicative of a visual effect on a particular viewpoint location and they should not be assumed to translate into visual effects on the overall visual experience within 7km, as each of the viewpoints have been specifically located where the sensitivity of the receptor and / or the views of the Proposed Development would be greatest. In this sense, they are not typical or representative.
- 9.4.17 The information set out in **Table 9.6** provides a summary of the viewpoint analysis and lists the names of the viewpoints and includes information as follows:
- ▶ LVIA Assessment:
 - ▶ Viewpoint Name and Number:

As it appears on the corresponding figure in FEI Volume 3;
 - ▶ Distance:

Distance of the viewpoint location from the nearest turbine within the Proposed Development;
 - ▶ Sensitivity:

The sensitivity of the viewer at the viewpoint location is recorded (ranging from high, medium, low, and negligible) in accordance with the methodology in ES **Appendix 9.A**;
 - ▶ Primary Magnitude:

The magnitude of change, taking account of the Proposed Development only, is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology;
 - ▶ Primary Level of Effect:

The level of visual effect for the Proposed Development only is recorded and takes account of the sensitivity and magnitude in accordance with the methodology.
 - ▶ Assessment: CLVIA:
 - ▶ Magnitude (Existing and Consented wind farms):

The magnitude of change, taking account of other existing and consented / under construction wind farms that may be visible on the wireframe is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology;

▶ Cumulative Level of Effect 1:

The level of visual effect, taking account of the other existing, consented / under construction wind farms and the Proposed Development, is recorded (taking account of the sensitivity and magnitude in accordance with the methodology). Those levels of effect shown in bold relate to significant effects in accordance with the relevant EIA Regulations and the wind farm contributing most to the cumulative effects is recorded in brackets;

▶ Magnitude (Other Application Wind Farms):

The magnitude of change, taking account of other wind applications that may be visible on the wireframe is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology;

▶ Cumulative Level of Effect 2:

The level of visual effect, taking account of the other existing, consented / under construction, application wind farms and the Proposed Development, is recorded (taking account of the sensitivity and magnitude in accordance with the methodology). Those levels of effect shown in bold relate to significant effects in accordance with the relevant EIA Regulations and the wind farm contributing most to the cumulative effects is recorded in brackets.

▶ Additional Level of Effect:

The additional level of effect resulting from the addition of the Proposed Development to the baseline of other existing, consented and application wind energy developments.

Sunlight and Weather Conditions

Changing weather patterns and local climatic conditions will influence the visibility of the Proposed Development which will vary from periods of low visibility (fog, low cloud, and bright sunny conditions that are accompanied by haze generated by temperature inversions) as well as periods of high visibility in clear weather.

Table 9.6 Summary of Viewpoint Analysis

Viewpoint Name and Number	Distance to nearest turbine	Sensitivity	LVIA Assessment: Proposed Development (Primary Effects)		Cumulative Assessment: (Proposed Development and other wind farms)				
			Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented only)	Cumulative Level of Effect 1: (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications only)	Cumulative Level of Effect 2: (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
1. B741 North East of Dalmellington	2,254	High to Medium	Medium	Substantial / Moderate to Moderate	Zero	No cumulative effect	Low	Substantial / Moderate to Moderate	Substantial / Moderate to Moderate
2. B741 South West of New Cumnock	3,213	High to Medium	High to Medium	Substantial to Substantial / Moderate	Negligible	Substantial to Substantial / Moderate	Medium	Substantial to Substantial / Moderate (Enoch Hill + South Kyle)	Substantial to Substantial / Moderate
3. Core Path 667 Water of Deugh	4,463	High	Negligible	Slight	Low	Moderate	High	Substantial (South Kyle)	Slight
4. New Cumnock Cemetery	5,878	High	Medium	Substantial / Moderate	Low	Substantial / Moderate	Medium	Substantial / Moderate (Enoch Hill + Pencloe)	Substantial / Moderate
5. Highpoint north of site (near Auchinross)	6,482	Medium	High to Medium	Substantial / Moderate to Moderate	Low	Substantial / Moderate to Moderate	Medium to Low	Substantial / Moderate to Moderate (Enoch Hill + Pencloe)	Substantial / Moderate to Moderate
6. Blackcraig Hill	7,195	High	Medium	Substantial / Moderate	High	Substantial	Medium	Substantial (Enoch Hill + Afton + South Kyle)	Moderate
7. Lochside Hotel	7,189	High	Medium	Substantial / Moderate	Low	Substantial / Moderate	Medium	Substantial / Moderate (Enoch Hill + Pencloe)	Substantial / Moderate
8. Cairnsmore of Carsphairn	8,728	High	Low	Moderate	Medium	Substantial / Moderate	Medium	Substantial / Moderate (Enoch Hill + Windy Standard, Windy Rig + South Kyle)	Moderate

Viewpoint Name and Number	Distance to nearest turbine	Sensitivity	LVIA Assessment: Proposed Development (Primary Effects)	Cumulative Assessment: (Proposed Development and other wind farms)					
			Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented <u>only</u>)	Cumulative Level of Effect 1: (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications <u>only</u>)	Cumulative Level of Effect 2: (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
9. Bogton Loch	9,525	High	Negligible	Slight	Zero	No cumulative effect	Low	Moderate	Slight
10. Fort Carrick	9,592	High	Zero	No View	No cumulative effect				
11. Auchenroy Hill	10,921	High	Low	Moderate	High	Substantial (due to Dersallock)	High	Substantial (due to Dersallock + Keirs Hill)	Moderate
12. Corsencon Hill	11,588	High	Low	Moderate	High	Substantial (due to Glenmucklock)	High	Substantial (due to Glenmucklock + Lethans)	Slight
13. Loch Doon Shore	12,287	High	Negligible	Slight	Zero	No cumulative effect	Medium to Low	Substantial / Moderate to Moderate (South Kyle and Benbrack)	Slight
14. A70 Between Cumnock and Prestwick	14,626	Medium	Low	Slight	Negligible	Slight / Negligible	Medium to Low	Moderate to Slight	Slight
15. A76 North of Auchinleck	15,678	Medium	Low to Negligible	Slight to Slight / Negligible	Negligible	Slight to Slight / Negligible	Negligible	Slight to Slight / Negligible	Slight to Slight / Negligible
16. A70 NE of Cumnock	17,466	Medium	Zero	No View	No cumulative effect				
17. A76 Mauchline	19,565	High	Negligible	Slight	Negligible	Slight	Negligible	Slight	Slight
18. Shalloch on Minnoch	22,117	High	Negligible	Slight	Negligible	Slight	Negligible	Slight	Slight

Viewpoint Name and Number	Distance to nearest turbine	Sensitivity	LVIA Assessment: Proposed Development (Primary Effects)	Cumulative Assessment: (Proposed Development and other wind farms)					
			Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented <u>only</u>)	Cumulative Level of Effect 1: (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications <u>only</u>)	Cumulative Level of Effect 2: (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
19. Meikle Millyea	23,760	High	Negligible	Slight	Low to Negligible	Moderate to Slight	Low to Negligible	Moderate to Slight	Slight
20. Kirriereoch Hill	23,952	High	Negligible	Slight	Negligible	Slight	Negligible	Slight	Slight
21. Merrick	24,748	High	Negligible	Slight	Negligible	Slight	Negligible	Slight	Slight
22. East Mount Lowther	29,760	High	Negligible	Slight	Negligible	Slight	Negligible	Slight	Slight

9.5 Baseline Description

9.5.1 Drawing from the viewpoint analysis and consultation advice, the scope and geographical extent of the FEI assessment has been limited to landscape receptors within 5km and visual receptors within 10km of the Proposed Development as a result of the consultation advice. Landscape and visual receptors previously assessed as less than moderately affected in the ES, and not subject to further consultation have been noted, but excluded from further revised assessment within the FEI.

9.5.2 The baseline inventory is set out as follows:

- ▶ Baseline Landscape Receptors:
 - ▶ Landscape Character of the Development Site;
 - ▶ Landscape Character of the Surrounding Area;
 - ▶ Landscape Designations; and
- ▶ Baseline Visual Receptors:
 - ▶ Settlements and Residential Properties;
 - ▶ Transport Routes;
 - ▶ Recreational Routes; and
 - ▶ Recreational and Tourist Destinations.

A Wild Land assessment was included in the ES, although it has not been updated as no significant impacts were identified in the ES and it has not attracted further consultation advice. It is considered that the results of the Wild Land assessment (no significant effects on Wild Land) would be unlikely to change as a result of the Revised Layout.

Baseline Landscape Receptors

9.5.3 The landscape character of the Development Site is classified within the following landscape character assessments:

- ▶ East Ayrshire Wind Farm Landscape Capacity Study (EALCS) Final Main Report, Carol Anderson Landscape Associates 2013, which draws from the earlier Ayrshire Landscape Assessment (Land Use Consultants, SNH Review No. 111, 1998); and
- ▶ Dumfries and Galloway Wind Farm Landscape Capacity Study, Final Main Report, Carol Anderson in association with Alison Grant Landscape Architects, 2011 (DGLCS).

9.5.4 The Development Site is classified within these documents as Southern Uplands and Southern Uplands with Forestry Landscape Character Types (LCTs) and collectively they record a high / medium to low, inherent landscape sensitivity to large scale turbine development. The large or extensive scale and simplicity of the landscape character is recognised in both documents as an opportunity for large scale wind farm development, noting that the general lack of settlement and presence of forestry are factors indicating some capacity for large scale wind turbines.

9.5.5 It may also be noted that further landscape classification of land within Dumfries and Galloway has been undertaken since the date of the ES in the following document:

- ▶ Dumfries and Galloway Wind Farm Landscape Capacity Study, Revised and updated study report – EEI Committee, Carol Anderson Landscape Associates 2016 (DGLCS2).

9.5.6 Although there has been little change to the baseline of other existing and consented wind farm development within the Southern Uplands with Forestry LCTs since the date of the 2011 DGLCS, the 2016 DGLCS2 records an increase in the overall sensitivity and value from 'Low' to a Landscape and Visual Sensitivity of 'Medium' and a Landscape Value of 'Medium to Low'. The

2016 DGLCS2 helpfully advises that the sensitivity rating for the whole of the Southern Uplands with Forest (19a) LCT is provided as one single sensitivity assessment. This means that there could be variations of either increased or decreased sensitivity across this LCT which covers several different geographical regions within Dumfries and Galloway. It also remains indicative of a transition or gradient of changing landscape sensitivity across the wider extent of the Southern Uplands and Southern Uplands with Forestry LCT which extends further north into East Ayrshire.

- 9.5.7 Taken together, all 3 documents indicate a 'gradient' of inherent sensitivity from 'Low' (2011 DGLCS) or 'Medium' (2016 DGLCS2) in Dumfries and Galloway within the Southern Uplands with Forestry: Carsphairn LCA; to 'High to Medium' (EALCS) within East Ayrshire's Southern Uplands with Forestry and Southern Uplands LCAs.

Landscape Character of the Development Site

- 9.5.8 The landscape character of the Study Area is illustrated in FEI **Figures 9.16** and **9.17** Volume 2. FEI **Figure 9.17** illustrates the landscape character of the central 10km of the LVIA Study Area at a more detailed scale, taking account of additional localised surveying as indicated by the target note locations. The landscape character of the Development Site is located within the EALCS and is classified in that document as falling within the following two landscape character types as follows:
- ▶ East Ayrshire Southern Uplands LCT (Benty Cowan Hill LCA); and
 - ▶ Southern Uplands with Forestry LCT (Enoch Hill LCA).
- 9.5.9 In addition, the Development Site and surrounding area was re-surveyed by chartered landscape architects as part of the ES assessment at a local level in accordance with guidance provided in GLVIA 3 (Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and IEMA, 2013) and the 'Landscape Character Assessment – Guidance for England and Scotland' produced by the University of Sheffield and Landuse Consultants, Countryside Agency and SNH, 2002. The advice from GLVIA 3 notes on page 79, paragraph 5.16:
- 9.5.10 *"Even where there are useful and relevant existing Landscape Character Assessments and historic landscape characterisations, it is still likely that it will be necessary to carry out specific and more detailed surveys of the site itself and perhaps its immediate setting or surroundings. This provides the opportunity to record the specific characteristics of this more limited area, but also to analyse to what extent the site and its immediate surroundings conform to or are different from the wider Landscape Character Assessments that exist, and to pick up other characteristics that may be important in considering the effects of the proposal."*
- 9.5.11 This re-surveying at a local level reflects local variations in character and landuse (mainly forestry and open-cast mining activities) not represented in the national and regional character studies previously noted (EALCS and DGLCS2). The localised surveying is described in target notes which were included in ES **Appendix 9.D** and are further supported by an additional three target notes contained in FEI **Appendix 9.D**.
- 9.5.12 Landscape character boundaries are often diffuse and in reality the transition from one landscape character to another is often gradual, occurring over 1-3km although it can be more abrupt, occurring along a cliff edge or ridgeline, for example. The landscape character across the Development Site area is transitional between the Upland Basin in the north, close to the B741 and the Southern Uplands and Southern Uplands with Forestry in the south and also as a result of opencast mining in the area. Consequently, the landscape character across the Development Site area has been reviewed and re-surveyed as part of the assessment and two modifications were suggested in the ES (**Chapter 9**) as follows:
- ▶ Adjustment of the boundary between Southern Uplands and Southern Uplands and Forestry: Enoch Hill LCA:
- The southern part of the Development Site area, to the south of the summit hills (Chang Hill Ewe Hill and Benty Cowan Hill) is partly influenced by nearby coniferous forestry which 'cups' around the area of the proposed turbines to the west, south and southeast, characterising the landscape and views in that direction as being more closely related to the Southern Uplands

and Forestry: Enoch Hill LCA, rather than the Southern Uplands. This southern part of the Development Site therefore is more closely associated and representative of the Southern Uplands with Forestry LCT, or is at least representative of a transitional area, being increasingly characterised and influenced by expansive commercial forestry, further to the south. Other notable influences include visibility of existing / under construction and consented wind farm development, background noise from the open cast development further north and visibility of the lowland settled landscape of the Upland Basin LCA.

► Upland Basin with Open-cast Mining:

Part of the landscape character of the Upland Basin is influenced by current or recent open-cast mining which affects the area shaded on FEI **Figure 9.17**.

Landscape Character within 5km of the Proposed Development

9.5.13 Landscape character within 5km of the Proposed Development that has been included in the revised assessment is illustrated in FEI **Figure 9.17**, Volume 2. Each of these along with their particular LCA / unit sub-divisions is listed in **Table 9.7**.

Table 9.7 Landscape Character within 5km of the Proposed Development

Ref. No.	Landscape Character Type (LCT)	Landscape Character Area (LCA) (used in this LVIA)
East Ayrshire Wind Farm Landscape Capacity Study: 'EALCS'		
20a	East Ayrshire Southern Uplands	Benty Cowan Hill
20c	Southern Uplands and Forestry	Enoch Hill
15	Upland Basin	New Cumnock Including the area influenced by Opencast Mining

9.5.14 LCAs within 5km that have been excluded from the assessment include the Foothills with Forestry and Open-cast Mining: Martyrs Moss LCA (17a) to the northwest and Upland Glen: Glen Afton (14). A further area of Southern Uplands with Forestry: Carsphairn (19a) within Dumfries and Galloway has also been excluded from the assessment.

9.5.15 The residual landscape effects on these three LCAs were previously predicted in the ES as Slight or Negligible and not significant.

Baseline Pattern of Wind Farm Development

9.5.16 The current pattern of wind energy development within 10km of the Proposed Development is illustrated in FEI **Figure 9.17**. Within this 10km area there are 2 existing / under construction and consented groups of wind energy development and a further large cluster of wind farm applications within this area as follows:

- The Hare Hill Group: Hare Hill, Hare Hill Extension and Sanquhar;
- The Windy Standard Group: Windy Standard, Windy Standard Extension and Afton; and the single turbine at High Park Farm which overlooks the Upland Basin;
- A further group of wind farm applications is located to the east and north of the Windy Standard Group, comprising South Kyle, Pencloe, Benbrack, and Windy Rig and Lorg further to the south. The Proposed Development forms part of this group, being located to the north of the South Kyle application;

- ▶ Further single turbines are located within the lower lying landscapes at Taiglim Farm and Mansfield Mains.

9.5.17 Currently it is considered that the existing / under construction and consented wind farms are perceived as characteristic of this area. To use the SNH terminology, the wind farm development would be seen as a “*key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area*”.

Landscape Designations

9.5.18 The Proposed Development is located within the south western edge of the locally designated Afton Sensitive Landscape Character Area (SLCA). The area covers the entire Afton valley as well as the Muirkirk Uplands area to the north of the A76.

9.5.19 Landscape designations within the wider 35km radius Study Area are illustrated in FEI **Figure 9.19**, Volume 2.

9.5.20 There are no nationally or internationally designated areas within the 35km study area.

Baseline Visual Receptors

9.5.21 The visual assessment draws upon the blade tip ZTV, site visits and viewpoint analysis and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape as follows:

- ▶ Views from residential properties and settlements;
- ▶ Views experienced whilst travelling through the landscape (e.g. road users, walkers, horse riders and cyclists); and
- ▶ Views from tourist and recreational destinations.

Visual Receptors: Settlements and Residential Properties

9.5.22 All settlements (defined by the relevant development plans) within 10km of the Proposed Development have been included in the revised assessment and illustrated in FEI **Figure 9.22**. The assessment of visual effects likely to be experienced from settlements includes consideration of residential areas, the public realm, and public open spaces within the settlement boundaries that would be frequented by people.

9.5.23 Settlements within 10km, which are included in the revised assessment are as follows:

- ▶ Burnside;
- ▶ Bankglen;
- ▶ Connel Park;
- ▶ Leggate;
- ▶ New Cumnock;
- ▶ Dalmellington; and
- ▶ Burnton.

9.5.24 Although the ES assessment of Dalmellington predicted visual effects ranging from Slight to No View and not significant, the SNH post application consultation response expressed concerns about the further encirclement of Dalmellington and New Cumnock. The revised assessment has therefore considered this aspect further.

9.5.25 Although just beyond 10km, an assessment of the visual effects from Cumnock has been included as a result of the post application consultation response from EAC.

- 9.5.26 The settlements of Bellsbank and Skares are located within 10km of the Proposed Development, but are outwith the blade tip ZTV and would have no view of the Proposed Development.

Residential Visual Amenity Assessment

- 9.5.27 Residential properties included in the Residential Visual Amenity Assessment are illustrated in FEI **Figure 9.23a** and assessed in FEI **Appendix 9.C**. A summary of that assessment is provided in this chapter as part of the visual assessment.

Visual Receptors: Transport Routes

- 9.5.28 Transport routes within 10km of the Proposed Development which have been included in the assessment are illustrated on FEI **Figure 9.20** and listed as follows:
- ▶ A and B Class Roads:
 - ▶ A76 between Cumnock and Burnton east of New Cumnock (this section of the route has been assessed in detail);
 - ▶ A713 Galloway Tourist Route between Waterside and Dalmellington (the road is outwith ZTV further south);
 - ▶ B741 between Auchenroy and New Cumnock (this route has been assessed in detail); and
 - ▶ Glasgow to Carlisle railway line near New Cumnock.
- 9.5.29 The Afton Road between New Cumnock and Burns Cairn has been included in the assessment of recreational routes as it is overlapped by Core Path C10: Coalfield Cycle Route, a Heritage Path and a Scottish Hill Track. Further south, beyond the New Cumnock Cemetery the road is outwith ZTV and there would be No View of the Proposed Development.
- 9.5.30 Two minor roads in the vicinity of the Proposed Development, namely the part of the C36 Road between Cumnock and New Cumnock and the minor road between B741 at Littlemark and Garallan Bridge on Skares Road (B7046) are no longer accessible due to on-going open cast mining operations now occupying the road area. Restoration plans for the open cast mining operations were available. However, the detail of how the roads will be reinstated and the timeframe for reinstatement are unknown. They have therefore been excluded from the assessment.

Visual Receptors: Recreational Routes

- 9.5.31 The visual assessment has considered the potential visual effects likely to be experienced by people (walkers / cyclists / horse riders / and others) on recreational routes within the LVIA Study Area. The recreational routes within the LVIA Study Area are illustrated in FEI **Figures 9.20 and 9.21**, Volume 2.
- 9.5.32 The Core Path Network and Rights of Way identified on the adopted Core Path Plans sourced from EAC and DGC along with recorded Scottish Hill Tracks and Heritage Paths, promoted by the Scottish Rights of Way and Access Society, have been re-assessed within the 10km study area.
- 9.5.33 There are no national or long distance routes within the 10km Study Area.

The Core Path Network

- 9.5.34 The revised visual assessment has considered the views from Core Paths and Rights of Way within 10km of the Proposed Development. Core Path Plans were created in response to a requirement of the Land Reform (Scotland) Act 2003. They aim to establish and designate a reasonable network of paths to provide access throughout local authority areas in which individual paths may be chosen because they meet at least one objective from a range of purposes, including linking communities, providing access to places of interest and for recreation.

- 9.5.35 Core Paths and Rights of Way included in the revised assessment are listed as follows:
- ▶ DGC Core Path No. 667: Water of Deugh Trail;
 - ▶ EAC Core Path No. C12: New Cumnock Circular; and
 - ▶ Rights of Way (numbered 'a-g' on FEI **Figure 9.21**) including one which is routed within the Development Site.
- 9.5.36 The EAC Core Path No. C10: Coalfield Cycle Route has been excluded from the revised assessment as the ES predicted visual effects of Slight to No View, due to its location within the wooded valley of Glen Afton and / or commercial forestry and existing / under construction wind energy development at Afton and Windy Standard. The northern part of this route along Afton Road however, coincides with the Heritage Path and Scottish Hill Track 84 and has been jointly included in that assessment.
- 9.5.37 EAC Core Path No. C14: Glen Afton, which coincides with the New Cumnock Community Paths (Afton Water Route) has similarly been excluded from the revised assessment as the ES predicted there would be No View from this route.

Heritage Paths and Scottish Hill Tracks

- 9.5.38 Scottish Hill Tracks and Heritage Paths within 10km included in the revised assessment are listed as follows:
- ▶ Heritage Path and Scottish Hill Track 84: Afton Road (also part Core Path C10: Coalfield Cycle Route); and
 - ▶ Scottish Hill Tracks - 81: Barr to Dalmellington and 78b: Glen Trool Village to Dalmellington by Tunskeen.
- 9.5.39 The Heritage Path and Scottish Hill Tracks - 77a: Bargrennan to Dalmellington or Carsphairn and 78a: Dalmellington and Loch Doon Heritage Path (both following the same route) are entirely outwith the blade tip ZTV coverage and have been excluded from the assessment.

Visual Receptors: Recreational and Tourist Destinations

- 9.5.40 Recreational and tourist destinations included in this assessment include those features that appear as prominent landmarks or landscape features and locations associated with passive recreation such as walking and where there is a clear relationship between the feature / destination and the landscape. Gardens and Designed Landscapes (GDLs) would be included where these are open to the public as well as Scottish National Trust gardens/land and Historic Scotland visitor sites. The assessment, for example, excludes locations for sports such as quad biking and team sports or other recreational / tourist destinations where the focus of activity is indoors, for example museums, libraries, and gift shops.
- 9.5.41 Recreational and tourist destinations included in the revised assessment, within 10km of the Proposed Development include local landscape features and sites of cultural and natural heritage importance, which are open to the public and promoted for tourism purposes including GDLs listed on the Historic Scotland Gardens & Designed Landscapes Inventory as well as the non-inventory gardens shown on the Ayrshire Designed Landscapes Survey map (Ayrshire Joint Planning Steering Group, 2009) and the DGC Historic Environment Viewer maps.
- 9.5.42 Recreational and tourist destinations within 10km of the Proposed Development included in the revised assessment include the following:
- ▶ Knockshinnoch Lagoons - local nature reserve; and
 - ▶ Craigengillan GDL.
- 9.5.43 The Burns Memorial, the Galloway Forest Park and Loch Doon have been excluded from the revised assessment as the ES predicted visual effects of Slight to No View.

- 9.5.44 The EAC non-inventory gardens at Camlarg (No.147) and Glaisnock (No.83) are not open to the public and have therefore been excluded from the assessment.
- 9.5.45 The following hill summits overlapped by the ZTV are located within the 10km study area:
- ▶ Cairnsmore of Carsphairn 797m Above Ordnance Datum (AOD) (Corbett);
 - ▶ Blackcraig Hill 700m AOD (Graham); and
 - ▶ Windy Standard 698m AOD (Graham).

Information Gaps

- 9.5.46 There are no known information gaps within the landscape, visual and cumulative assessments.

Future Baseline

- 9.5.47 The baseline landscape character and baseline of other cumulative wind farm developments are subject to change over time. Areas of open cast mining and eventual restoration as well as forestry operations, for example, can alter the underlying landscape character of an area and the likely extent of visibility. The assessment has sought to take account of likely changes in the baseline that could lead to a significant change to the predicted effects where these can be reasonably predicted, for example the presence of a consented wind farm not yet constructed, or known forestry operations undertaken as part of a publically available Forestry Design Plan.

9.6 Landscape Design Statement and Mitigation

- 9.6.1 A revised and illustrated Landscape Design Statement is set out in FEI **Appendix 9.A**. The production of a Design Statement is encouraged by the Scottish Government (PAN 68) and SNH through their document 'Siting and Design of Wind Farm in the Landscape, Version 2' May 2014. SNH explain that Design Statements help to communicate the decision making processes behind the wind farm design and explain why a particular design has been chosen and how this will relate to the underlying landscape and other wind farm development in the area, which may have influenced the design process.
- 9.6.2 The Landscape Design Statement has contributed to the wider environmental and technical design for the Proposed Development which is set out in its entirety in ES and FEI **Chapter 3**. This statement has drawn from the advice of SNH and EAC during the application process and other technical non-statutory guidance including the EALCS. The design concept has taken account of the SNH 'Guidance on Siting and Designing Windfarms' aiming to achieve a simple, rational, and cohesive design that limits overlapping turbines and gaps within the visual composition.
- 9.6.3 The inherent nature of wind turbines as tall, modern structures means that the form of the wind farm as a whole is important, and a clear design strategy is necessary. The design strategy therefore considered the appearance or visual composition of the wind farm as an 'object' in the landscape, such that the positioning of the turbines in relation to each other, and the wider landscape setting is a factor in generating the layout.

Landscape Design Objectives

- 9.6.4 Part of the Design Statement is the establishment of Design Objectives which can also be referred to in future if the scope or circumstances of the proposed wind farm change.
- 9.6.5 The design objectives which were developed for the original design, and set out in the ES were considered by Ironside Farrar as part of their audit of the LVIA on behalf of EAC. They considered that the principles and objectives of the Design Statement generally reflected "*the sensitivities, opportunities and constraints identified in the EALCS*". For these reasons the design objectives have been retained and repeated from ES **Appendix 9.A** as follows:

- ▶ *“Achieve a simple, rational, and cohesive design from most viewpoints avoiding turbine stacking, gaps and outlying turbines so the scheme can be accommodated on a stand-alone basis or cumulatively;*
- ▶ *Turbine development should avoid the ‘front’ north facing hill slopes overlooking settlements, roads and residential receptors within the Upland Basin. The hill tops and visually less sensitive interior hills would be preferable in order to maintain a sense of separation between the lower lying areas and the more elevated Southern Uplands / Southern Uplands with Forestry which are most capable of accommodating wind farm development;*
- ▶ *Ensures that the scale of the Proposed Development is proportionate to the expansive scale of the underlying Southern Uplands with Forestry landscape and in terms of the perceived scale of development when viewed from residential properties, settlements, roads and footpaths within the New Cumnock Upland Basin LCA to the north;*
- ▶ *Achieve a design proposal that would be broadly compatible or co-existent with other existing and consented wind farm development within the LVIA Study Area. In this respect the design should adopt a clustered layout that is broadly similar to neighbouring wind farm developments in terms of perceived turbine height, number, proportion, three bladed turbine design, colour and lighting;*
- ▶ *The Proposed Development has a maximum turbine height of up to 130m, which compares reasonably well with the maximum turbine height consented at nearby schemes such as Sanquhar (130m), Dersalloch (125m) and Afton (120m & 100m);*
- ▶ *Maintain the simple landscape character of the Development Site by siting ground based infrastructure in the least visible locations when viewed from receptor locations to the north and north east including New Cumnock, the B741 and the A76;*
- ▶ *Limit landscape and visual effects on the visual receptors including local residents, roads, recreational routes and visitor / tourist destinations including Glen Afton.”*

9.6.6 In response to the comments on design from the EAC audit and SNH the Revised Layout has sought to achieve the following:

- ▶ Continue with a clustered layout avoiding north facing slopes and hill shoulders as far as possible;
- ▶ Produce a simpler and more compact layout with reduced horizontal spread; and
- ▶ Remove outlying turbine 16.

Landscape Design Considerations

9.6.7 Both the EALCS in East Ayrshire and the DGLCS(2) in Dumfries and Galloway provide sensitivity analysis of the Southern Uplands and Southern Uplands with Forestry LCTs, which may be considered relevant to the Development Site and collectively they record a ‘high to medium’ and ‘medium’ inherent landscape sensitivity to large scale turbine development, concluding that the perceived landscape capacity for large scale turbines ranges from ‘no scope’ to ‘very limited’ within East Ayrshire, with further capacity identified in Dumfries and Galloway. However, neither study refers to the Development Site directly and both refer to other named locations within these LCTs in order to explain and justify their conclusions.

9.6.8 It may be noted that within East Ayrshire, none of the LCTs are assessed as below Medium sensitivity to large scale wind farm development and only one LCT (Foothills with Forest and Opencast Mining: 17a) is assessed as of Medium sensitivity to large scale wind farm development. In total six of the twelve LCTs are assessed as being of High sensitivity and five of the twelve LCTs are assessed as being of High-Medium sensitivity to large scale wind farm development within the EALCS.

9.6.9 Both documents do however refer to the large or *expansive* scale and simplicity of the landscape character as an opportunity for large scale wind farm development, noting that the general lack of

settlement and presence of nearby forestry are factors that indicate some capacity for large scale wind turbines.

- 9.6.10 Particular references to Glen Afton and Loch Doon / Doon Water and Dalmellington as potential constraints are not relevant to the Proposed Development, due to the limited potential visibility of the Proposed Development from within these areas. Concerns about visual effects on the views towards the landmark hill summit of Blackcraig Hill and cumulative development close to Hare Hill Wind Farm are also not relevant in this case as indicated by the viewpoint analysis and visualisations which demonstrate that views of the Proposed Development would not interfere with views towards Blackcraig Hill or Craigbraneoch Rig on the eastern edge of Glen Afton.
- 9.6.11 A general reference to the potential visibility of wind farm development from the Upland Basin as a constraint is however a relevant consideration for this Proposed Development and one of the reasons for establishing a northern limit or 'turbine exclusion' zone across the north facing hill slopes of the Development Site. The establishment of a northern limit or 'turbine exclusion' zone across the north facing hill slopes of the Development Site was also developed in response to feedback obtained as a result of public consultation and Community Liaison Group meetings. This turbine 'exclusion area' ensures that turbines would not be positioned on the 'front' north facing hill slopes. This constraint also had the benefit of minimising potential visual effects on the views from the closest receptors, including residential properties located to the north of the Development Site and more general views from New Cumnock and the Upland Basin area to the north and north east.
- 9.6.12 It is of primary importance that the Proposed Development can be accommodated alongside other existing and consented development with particular consideration also given to the South Kyle and Pencloe applications, in the event that either one or both of these are also consented. The design of the Proposed Development has taken account of these possible cumulative scenarios as part of the turbine composition, viewed from a number of the assessment viewpoints, ensuring visual compatibility in terms of turbine layout and scale.

SNH Landscape Design Guidelines

- 9.6.13 The SNH guidance (*Siting and Design of Wind Farms in the Landscape, May 2014*) provides wind farm design guidance under a number of topics, each of which is considered, where relevant, as follows.
- ▶ Relating to Landscape Character

SNH suggest that, "*if windfarms already exist within a particular character type, further windfarm development should be limited to the same or similar types within the neighbouring area*". A key aim of the design evolution has been to locate the Proposed Development within the same, or similar Southern Uplands / Southern Uplands with Forestry LCTs and to ensure that the relationship of the Proposed Development to the underlying landscape character is similar to other existing and consented wind farms. In this respect, the clustered turbine layout of the Proposed Development compares favourably with other wind farm development within the Southern Uplands and Southern Uplands with Forestry LCTs, with proposed turbines limited to the southern part of the Development Site, avoiding northern facing hill slopes. The importance of avoiding these hill slopes is indicated by the existing single turbine at Hill Park Farm, on Dalhanna Hill which is prominently visible against the northern facing hills slopes of Hare Hill, despite its smaller scale size. In comparison, the Proposed Development is set back on an area of the skyline or horizon that is broad and simple and avoids landmark topography.
 - ▶ Complementing Landform

Through the design process, the proposed turbine locations have been 'pushed back' towards the south of the Development Site, within an extensive and large scale landscape with an open and simple landscape pattern. As noted above, the Proposed Development would not adversely affect the general visibility and prominence of landmark hills such Blackcraig Hill, Cairnsmore of Carsphairn and Corsencon Hill.

The Proposed Development would avoid the “*lower, interlocking ridges to the west*” and the landmark hills to the east of Glen Afton which are identified as a sensitive landform within the EALCS.

► Settlements

There is no settlement within the host landscape or within 2km of the Proposed Development. Viewpoint analysis during the design evolution process has ensured that views from those settlements beyond 3km have been minimised as far as possible. Cumulative effects on New Cumnock and views from the A76 to the north are noted in association with other existing and consented development also visible from this area. Although there would be an ‘intensification’ of development visible to the south, this would be located in the south and as such would not ‘surround’ or ‘enclose’ New Cumnock. Further graphical illustration of this point is provided in **Appendix 9.A**.

► Focal Point, Pattern and Scale

As stated above, the nearest ‘focal point’ is the ‘landmark hill’ of Blackcraig Hill. Viewpoint assessment and site survey have confirmed that the Proposed Development would not compete with or diminish the landmark hill qualities of Blackcraig. The Proposed Development would be located to the lea of outer hill summits (Chang Hill, Benty Cowan Hill, Rigg Hill and Peat Hill) and set within a large and expansive scale landscape capable of accommodating large scale turbines. The pattern of coniferous forestry ‘cups’ around the area of the proposed turbines to the west, south and southeast, characterising the area as Southern Uplands and Forestry.

► Relationship between Wind Farms

The design of the Proposed Development has been mindful of the existing and consented development as well as the South Kyle and Pencloe wind farm planning applications close to the Development Site, ensuring that the turbine composition of the Proposed Development would appear visually compatible with either or both of these applications.

The proposed clustered layout and number of turbines would be comparable with other existing, consented and application wind farm development in the area also comprising a clustered turbine layout. The proposed maximum blade tip height of up to 130m is comparable with the proportions and height of turbines at recently consented nearby schemes such as Sanquhar (130m), Dersalloch (125m) and Afton (120m & 100m).

Design Evolution

9.6.14

The design evolution is illustrated further in of the Landscape Design Statement (FEI **Appendix 9.A**) and comparative wireframes are provided from some of the key viewpoints to illustrate the main improvements of the design evolution as follows:

- Further design work has been undertaken to reduce the horizontal field of view (FoV) affected by the proposed turbines, creating a more cohesive and even composition with reduced turbine stacking and number of visible turbine hubs as follows:
 - Viewpoint 4: New Cumnock Cemetery - Horizontal FoV reduced from 23° to 14° and turbine numbers from 17 to 15;
 - Viewpoint 5: High point north of site near Auchinross - Horizontal FoV reduced from 29° to 18° and turbine numbers from 19 to 16;
 - Viewpoint 7: Lochside Hotel - Horizontal FoV reduced from 23° to 15° and turbine numbers from 19 to 15;
 - Viewpoint 12: Corsencon Hill - Horizontal FoV reduced from 12° to 10° and turbine numbers from 19 to 16.
- Removal of an outlying turbine (numbered turbine 16 in the ES).

- ▶ The revised turbine positions avoid north-facing hill slopes where possible, reducing their potential prominence in the view. In this respect, the proposed turbines appear on or beyond the horizon, avoiding 'front' or north facing hill slopes;
- ▶ The proposed turbines have also been designed to appear in scale with the proposed South Kyle Wind Farm, should this be consented, or equally to appear as a balanced, cohesive group in the case that the South Kyle Wind Farm was not consented.

9.6.15 There has been limited change to the visual composition viewed from the summits of Blackcraig Hill and Cairnsmore of Carsphairn and the integrity of the design and visual composition as it would appear from those locations has been preserved.

Mitigation Inherent in Proposed Development

9.6.16 Particular design mitigation measures include the location of site infrastructure: anemometer masts, Scottish Power Energy Networks (SPEN) substation compound, temporary construction compounds, borrow pit search areas and Development Site access / access tracks have all been located to areas of the Development Site where there would be limited visibility from the main receptors to the north and northeast in the Upland Basin. In particular the SPEN substation compound, borrow pit search areas and access tracks have been located as far as possible to the lee of hills or southern and southwest positions and summits to reduce visibility. The success of this design approach can be seen in the visualisations prepared for those viewpoints within 5km where the proposed infrastructure has been rendered onto the photomontages where visible (Viewpoints 1, 2, 3, 4 and 5). As can be seen from these viewpoints, there would be limited visibility of the associated infrastructure from these locations.

9.6.17 Further mitigation, set out in the ES has been reviewed and repeated in FEI **Appendix 9.A** for completeness.

9.7 Residual Landscape Effects

9.7.1 Landscape Effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2 as follows.

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner."

9.7.2 These effects are assessed by considering the landscape sensitivity (value and susceptibility) against the magnitude of change. The type of effect may also be described as temporary or permanent, direct or indirect, cumulative and positive, neutral, or negative.

9.7.3 The residual landscape effects assessed here are those effects remaining after all of the design mitigation has been taken into account.

Overview of the Landscape Character of the Development Site

9.7.4 Landscape character and cumulative wind farm development within 10km of the Development Site is illustrated in FEI **Figure 9.17**.

9.7.5 The Development Site is located within an extensive area of Southern Uplands and bounded to the west, south and east by extensive coniferous forestry and the Carsphairn Forest. The Southern Uplands with Forestry generally and the Carsphairn Forest in particular are noted in both the EALCS and the DGLCS2 to be amongst those landscape character types most able to accommodate wind energy development in the form of large turbine development.

- 9.7.6 The topography is of rounded hills including Benty Cowan Hill (477m AOD), Chang Hill (463m AOD), Ewe Hill (437m AOD) and Enoch Hill (569m AOD), typical of the Southern Uplands LCT split by steep, incised gullies at Dalleagles Burn, Knockburnie Glen and Connel Burn within the northern half of the Development Site, with more gentle, although elevated, landform in the southern part of the Development Site (FEI **Figure 9.18**). The landcover is predominantly rough grassland, referred to as 'hill pasture' in the EALCS with coniferous forestry influencing the southern part of the Development Site and forming the eastern and southern Development Site boundaries. The northern part of this area, along the B741 corridor, is sparsely settled with scattered properties and small groups, whilst there are no residential properties or settlements in the vicinity of the southern part of the Development Site. There are no particular features of interest, core paths or other recreational routes within the Development Site.
- 9.7.7 The proposed turbines are located within the northern edge of the same Southern Uplands unit, just beyond the edge of the wider Carsphairn Forest which forms an extensive area of Southern Uplands and Southern Uplands and / or with Forestry. The partial 'containment' of the Development Site by landform and forestry to the west, south and east has contributed to the limited ZTV coverage of these areas to the west, south and east as illustrated in the ZTVs, most noticeably in FEI **Figure 9.4b**. The most concentrated areas of ZTV is related to the site area and land to the north and northeast, including the Southern Uplands: Benty Cowan Hill LCA, the Southern Uplands and Forestry: Enoch Hill LCA and the Upland Basin LCA.

Identification of the Landscape Character of the Development Site

- 9.7.8 The area of the Development Site is partly within the Southern Uplands and Forestry: Enoch Hill LCA and partly within the Southern Uplands: Benty Cowan Hill LCA as classified by the EALCS. The proposed turbines are located on the un-forested summits and predominantly southern facing slopes of Enoch Hill, Barbeys Hill, High Chang Hill and Benty Cowan Hill, avoiding north facing hill slopes and shoulders, which face on to the low lying and settled landscape of the Upland Basin. Considering the boundaries drawn in the EALCS, at least 6 of the proposed turbines are located within the Southern Uplands and Forestry: Enoch Hill LCA and the remaining 10 turbines are located within the Southern Uplands: Benty Cowan Hill LCA.
- 9.7.9 Considering the wider extent of Southern Uplands and Southern Uplands and Forestry / with Forestry in East Ayrshire and Dumfries and Galloway, it may be noted that the EALCS and DGLCS2 boundaries of these LCTs are not restricted to forestry boundaries and large areas of un-forested land occur within the Southern Uplands and Forestry / with Forestry. In addition, large areas of forestry also occur within areas of Southern Uplands within parts of East Ayrshire and Dumfries and Galloway. This is particularly true at the local level where the southern part of the Development Site and the proposed turbine locations, within the Southern Uplands and Forestry: Enoch Hill LCA, is un-forested. It is also noted that the adjacent Southern Uplands: Benty Cowan Hill LCA includes an area of forestry that extends approximately 750m further north beyond the boundary of the Southern Uplands and Forestry: Enoch Hill LCA. It is therefore the case that the LCT boundaries reflect the degree to which the forestry in particular, influences the landscape character and so some areas, although un-forested are included within the Southern Uplands and Forestry / with Forestry LCTs due to the characterising influence of adjacent forestry, or because the extent of the open areas is representative of a smaller fragment, not large enough to otherwise register as an area of (un-forested) Southern Uplands, which by their nature are large scale and extensive areas of landscape character.
- 9.7.10 Although the boundary between different landscape character areas is rarely exact, further site survey and analysis (FEI **Appendix 9.D**) has sought to rationalise the landscape character classification within the Development Site area at a local level, resolving the atypical peculiarities relating to the presence or absence of forestry and the extent to which this has had a characterising influence on the overall landscape character of the Development Site. Based on site survey and detailed analysis, the boundary between the two LCAs has been re-drawn between these two areas and is illustrated in **Figure 9.17**, based largely on the extent to which existing coniferous forestry and existing / under construction and consented wind energy development influences the area of the proposed turbines, as observed on site, despite this area being largely un-forested. The southern part of the Development Site has more in common with the Southern

Uplands and Forestry LCT with characteristic attributes relating to landform, nearby coniferous forestry, wind farm development and perceptions of remoteness. Within this area, the landscape is influenced by adjacent areas of coniferous forestry which ‘cups’ around the area of the proposed turbines to the west, south and southeast and is visible as extensive areas of coniferous forestry, at relatively short distances in the landscape, in comparison to more extensive views of southern uplands to the north, albeit characterised by the adjacent land uses of the Upland Basin which include the sight and sound of opencast coal mining.

- 9.7.11 All of the proposed turbines would be located within 1km of forestry and at least 11 turbines within 500m of forestry. Taken together the detailed landscape character analysis and the site survey information indicates that all of the proposed turbines could be considered as located within the Southern Uplands and Forestry: Enoch Hill LCA. Alternatively, the area of the proposed turbines can be considered as at least ‘transitional’ between the two LCAs.
- 9.7.12 The EAC consultation response was based on an audit of the ES conducted by Ironside Farrar on behalf of EAC who remained ‘unconvinced’ of the revised LCA boundary as presented in the ES. SNH did not comment on the revised LCA boundary and considered that the majority of the proposed turbines would be located within the Southern Uplands, based on the information within the EALCS.
- 9.7.13 Whilst we do not agree with the comments in paragraph 9.7.12, in order to take account of the consultation comments from EAC and SNH both possibilities have been assessed in the FEI.

Direct Landscape Effects: Southern Uplands and Forestry: Enoch Hill LCA

- 9.7.14 This landscape extends across the boundary into Dumfries and Galloway where it is described as Southern Uplands with Forests LCT and the two areas together form a larger area of the same overall character type, covering the Carsphairn Forest. At least 6 of the proposed turbines would be located within an un-forested part of the Southern Uplands and Forestry: Enoch Hill LCA and all of the proposed turbines could also be considered as being either within this LCA or at least falling within a transitional area between the Southern Uplands and Forestry: Enoch Hill LCA and the Southern Uplands: Benty Cowan Hill LCA.
- 9.7.15 The key characteristics of the Southern Uplands and Forestry: Enoch Hill LCA, identified in the EALCS are described in comparison to the key characteristics of the Development Site, identified from further detailed analysis and site survey of the local area (as set out in FEI **Appendix 9.D**), in **Table 9.8**.

Table 9.8 Comparison of Key Characteristics of the Southern Uplands and Forestry: Enoch Hill LCA

Southern Uplands and Forestry: Enoch Hill LCA	
EALCS: Key Characteristics	Detailed Analysis Site Survey of Key Characteristics
<i>“This landscape forms a small part of the Southern Uplands with Forestry character type which extends into neighbouring Dumfries and Galloway and overall forms an expansive tract of uplands.”</i>	Within East Ayrshire, this LCA stretches between Dalmellington in the west and Glen Afton in the east and the Development Site is centrally located between the two.
<i>“The predominantly rounded hills of this character type are largely covered with commercial coniferous forestry which masks their landform although steep-sided narrow ridges and deep valleys are present.”</i>	The landform within the southern part of the Development Site is representative of the LCA description, although there are no “steep-sided narrow ridges and deep valleys” within the Development Site. Although there is no coniferous forestry within the Development Site, the southern part of it is bounded by forestry to the west, south and southeast. As a result, the southern part of the Development Site is influenced or characterised by the adjacent forestry and all of the proposed turbines are located within approximately 1km of extensive areas of forestry and at least 11 turbines within 500m of forestry.

Southern Uplands and Forestry: Enoch Hill LCA	
EALCS: Key Characteristics	Detailed Analysis Site Survey of Key Characteristics
<i>"A few of the highest hill tops are open and these are seen in views from the lower Loch Doon area and also backdrop the settlement of Dalmellington in the Doon Valley."</i>	<p>The Development Site consists of 'open topped' hills surrounded on 3 sides by forestry. They are visible in the backdrop 'containing' the Upland Basin, but are not representative of landmark hills or prominent summits.</p> <p>Hare Hill and the associated wind farm development is seen in the backdrop to New Cumnock when viewed from the north.</p> <p>The Development Site is visually remote from the Upland River Valleys of the Rivers Doon and Nith and the Afton Glen.</p>
<i>"This landscape is very sparsely settled with occasional farms sited on lower outward-facing slopes."</i>	<p>The area of the proposed turbines (within 2km) is uninhabited. The area is however within sight and sound of opencast coal mining in the Upland Basin to the north and has extensive views of the lowland settled landscape of the Upland Basin and to the south, extensive forestry and large wind farm development.</p> <p>As a result perceptions of remoteness, 'wildness', naturalness and tranquillity are weakened as indicated on the Field Survey Sheets in Appendix 9.D which do not record high levels of tranquillity and wildness.</p>
<i>"The B741 and A713 are aligned on the periphery of this landscape although views from these roads are restricted by landform and forestry."</i>	<p>The proposed turbines are remote from both the B741 and A713, as well as other roads.</p>
<i>"The operational and consented Windy Standard I and II wind farms are located in this same character type but within Dumfries and Galloway."</i>	<p>Further wind energy development is visible at Hare Hill and extension wind farms, and Afton when constructed, and the single turbine at High Park Farm.</p>

Landscape Sensitivity

- 9.7.16 Referring to both the EALCS and the DGLCS2, a gradient of inherent landscape sensitivity exists across the Southern Upland LCTs with low or medium sensitivity and scope for multiple large scale turbine development identified in the south of this wider area and medium to high sensitivity and no scope for such development identified in the north of this wider area as follows:
- ▶ Southern Uplands with Forests: Carsphairn LCA – Low landscape sensitivity and scope for multiple large scale turbine development identified in the DGLCS (increased to Medium within the DGLCS2 consultation document);
 - ▶ Southern Uplands and Forestry: Enoch Hill LCA – High-Medium landscape sensitivity with very limited scope for large scale turbine development within the eastern part of this area identified in the EALCS; and
 - ▶ Southern Uplands: Benty Cowan Hill LCA – High-Medium landscape sensitivity with no scope for large scale turbine development identified in the EALCS.
- 9.7.17 It may be noted that within East Ayrshire, none of the LCTs are assessed as below Medium sensitivity to large scale wind farm development and only one LCT (Foothills with Forest and Opencast Mining: 17a) is assessed as of Medium sensitivity to large scale wind farm development. In total six of the twelve LCTs are assessed as being of High sensitivity and five of the twelve LCTs are assessed as being of High-Medium sensitivity to large scale wind farm development within the EALCS.
- 9.7.18 The EALCS describes the inherent sensitivity of Southern Uplands and Forestry to large scale turbine development as follows:
- 9.7.19 *"While the large scale and relatively simple land cover of this character type reduces sensitivity to larger wind turbine typologies, likely effects on views from the Doon Valley and on the setting and views from the Loch Doon area and the settlement of Dalmellington are key constraints. Cumulative effects would also be likely to occur in conjunction with the operational/consented*

Windy Standard I and II wind farm, particularly where multiple developments were seen on the backdrop of hills which contain Loch Doon. Landscape sensitivity would be High-medium for the large typology (turbines >70m) and Medium for the medium typology (turbines 50-70m), reflecting increased opportunities for minimising intrusion and cumulative effects with smaller turbines."

- 9.7.20 It should be noted that all of the key constraints identified above, which serve to increase the sensitivity of this landscape, relate to Loch Doon, the Upper Doon Valley and the settlement of Dalmellington, which would not be significantly affected by the Proposed Development and are visually remote from the Development Site. Cumulative effects in association with the Windy Standard development as viewed from Loch Doon are also of limited relevance. However, key characteristics of large scale and relatively simple land cover are present and do indicate reduced landscape sensitivity.
- 9.7.21 The detailed assessment contained in the EALCS Appendix states that *"There may be some very limited scope for this typology to be sited within the eastern part of these hills to avoid significant intrusion on the wider landscape context."*
- 9.7.22 Further to this, the guidance for the development section of the EALCS (2013) states:
- 9.7.23 *"There may be some very limited scope for the large typology (turbines >70m) to be accommodated within this landscape. Turbines should be set well back from the more sensitive western edges of these uplands and should avoid significant impact on the setting of Loch Doon and the upper Doon valley including the settlement of Dalmellington. Potential cumulative effects with the operational Hare Hill, operational and consented Windy Standard I and II wind farms should be considered carefully, especially in views from the Upland Basin (15) and Afton Glen (14) character types. A key cumulative issue to consider will also be any contrasts in design layout that may be obvious in key views between the more clustered form of the nearby operational Hare Hill wind farm located in the adjacent East Ayrshire Southern Uplands (20a) and more linear layouts likely to be adopted in the eastern part of this character type."*
- 9.7.24 Much of this advice is of limited relevance and is focused on Loch Doon, the Upper Doon Valley and the settlement of Dalmellington as well as Glen Afton from which there would be limited or no visibility. Similarly the concerns about contrasts in design between more clustered and linear layouts is avoided by the Proposed Development which has adopted a more clustered layout that compares favourably with views of other existing and consented wind farm development and nearby wind farm applications such as South Kyle and Pencloe.
- 9.7.25 The Proposed Development would however, be visible from the Upland Basin and cumulative effects are noted as a constraint in that respect. A further potential constraint is identified in the EALCS as the *"Potential 'encirclement' of the settled Upland Basin (15) where the operational Hare Hill wind farm and any other larger turbines sited in this character type and also in the Foothills with Forestry and Opencast Mining (17a) and East Ayrshire Plateau Moorland (18a) would be seen in close proximity on containing skylines."*

Landscape Susceptibility and Value

- 9.7.26 At a detailed site level, a range of landscape criteria or indicators of sensitivity / susceptibility to wind energy development have been considered as set out in **Table 9.9**. They indicate that the Development Site area has a Medium to Low sensitivity in respect of its physical and perceptual criteria and Medium sensitivity in respect of the visual criteria and landscape value. An overall sensitivity of Medium is concluded, due mainly to the following factors:
- ▶ The key characteristics of this LCA (large scale, gently undulating landform, the influence of coniferous forestry, it's uninhabited nature and being visually remote from surrounding valleys, glens and basins) indicate a Medium to Low overall sensitivity and susceptibility to the Proposed Development;
 - ▶ Although the Proposed Development is located within the Afton SLCA local landscape designation it would not affect any of the key qualities or integrity identified by EAC when designating this area. The designation however, does indicate a Medium landscape value;

- ▶ The condition and management of the landscape is considered to be reasonably good although the landscape quality of this area in terms of its representativeness is considered to be Medium overall with the northern part of the site at least partly transitional into adjacent areas of landscape character which are less representative of the LCT;
- ▶ The main landscape element (grass moorland) which covers the Development Site area within this LCA is considered to be of Low landscape sensitivity. The surrounding vegetation type, commercial forestry, is also considered to be of Low landscape sensitivity;
- ▶ In terms of settlement, the LCA is largely uninhabited with low levels of settlement occurring around the northern fringes and along the B741 to the north and there are also no particular tourist or recreational receptors, indicating Low sensitivity;
- ▶ In terms of the surrounding landscape context the Development Site is noted to be closely related as a 'backdrop' to the lowland settled landscape of the Upland Basin and associated receptors. In this respect, a High - Medium sensitivity is noted.

Table 9.9 Landscape Susceptibility of the Southern Uplands and Forestry: Enoch Hill LCA

Landscape Attributes	Characteristics that are less susceptible to wind energy development			Characteristics that are more susceptible to wind energy development	
	Low	Medium – Low	Medium	High - Medium	High
Physical Characteristics:					
Scale	Larger scale landscapes and landform which may be more able to accommodate large scale wind turbines			Smaller scale well defined landforms which may become dominated or overwhelmed by wind turbines	
Landform and Topography	Simple upland plateau, gently rolling or flat landscapes as the turbines may be less easily scaled against the landform			Complex landforms with well defined changes in level including ridges, steep sloping hillsides and narrow valleys.	
Land Cover	Large scale simple and homogenous land cover including moorland, grasslands, and large forestry plantations, where the simplicity of the land cover may complement turbines			Complex and diverse land cover including a diversity of arable fields, grassland, trees / hedges / woodland, open water of a small scale that turbines may dominate.	
Pattern	Unenclosed land or rectilinear field patterns which may complement the modern aesthetic of turbines.			Irregular small scale patchwork or medieval field patterns where turbines may overwhelm the scale and landscape pattern.	
Settlement pattern	Sparse or no settlement with relatively few visual receptors and scale indicators.			Populated areas and lowlands with larger numbers of visual receptors and small scale indicators.	
Other Development	Large scale industrial, infrastructure and mineral extraction land uses detracting from the overall landscape sensitivity and value. Landscapes with vertical masts, pylons and turbines			Rural / traditional forms of development including parks and gardens and monuments enhancing the overall landscape sensitivity and value.	
Change and Movement	Busy major roads and other areas of significant mechanised movement where the movement of turbine blades may be in character			No roads or only quiet country lanes where turbine blade movement could be eye catching	

Landscape Attributes	Characteristics that are less susceptible to wind energy development			Characteristics that are more susceptible to wind energy development	
	Low	Medium – Low	Medium	High - Medium	High
Perceptual Characteristics:					
Wildness and Naturalness	Area not valued for wildness as a key characteristic or special quality.			Area valued for wildness as a key characteristic or special quality.	
Remoteness	Area that feels closer to people and human activities. Conversely, a remote area not valued for wildness or tranquility would have a lower number of visual receptors.			Area that feels remote from people and human activities. Conversely, landscapes that are settled / built up would have a higher number of visual receptors.	
Rational / Windswept	Open and exposed landscapes where turbines, though more visible, may be logically located on windswept locations.			Enclosed or sheltered landform likely to be of a smaller scale and limited rational for turbine locations.	
Visual Characteristics:					
Openness and Enclosure	Enclosed landscape with limited opportunities for long range views.			Open landscapes with opportunities for long range views.	
Skyline	Broad simple skylines lacking in distinctive or 'landmark' topography.			Skylines which are an important and noticeable component in the landscape with 'landmark' topography.	
Landmarks	Landscapes with no sensitive landmark features where turbines might detract from settings			Landscapes with landmarks and features such as church spires and prominent listed buildings where turbines might compete as landscape foci and detract from settings	
Surrounding Context	Self-contained landscape with limited relationship with adjacent areas.			Landscapes that are closely connected to the adjacent / surrounding areas in terms of similar character or visual backdrop.	
				Upland Basin	
Overall Susceptibility			Medium		

9.7.27 Drawing from this assessment, the sensitivity of the southern part of the Development Site (Southern Uplands and Forestry: Enoch Hill LCA) is assessed as *Medium* and between the 'high to medium' sensitivity identified in the EALCS and the low to medium sensitivity identified in the DGLCS2 for the two LCTs on either side of this area.

Magnitude and Level of Effect: during Construction

9.7.28 There would be no change from the ES assessment (**Chapter 9**) which is repeated as follows:

9.7.29 *“The construction phase would result in localised direct landscape effects on the Development Site and its component landscape elements. None of these are particularly sensitive (rough grassland / hill pasture of Low sensitivity). The construction works would affect localised areas, progressing from Zero magnitude of change to High towards the completion of the Proposed Development, the*

likely landscape effects on the fabric and constituent elements of the landscape would range from **Negligible to Moderate** and would not be significant.

- 9.7.30 *In terms of wider effects on landscape character, the magnitude of change and nature of effect would range progressively from Zero to High during the construction phase; primarily as a result of the turbines. Overall, the landscape effects on the Southern Uplands and Forestry: Enoch Hill LCA would range from **None**, increasing to **Substantial / Moderate** and significant upon completion, due to the height and scale of the proposed turbines. The geographical extent of the significant effects would be limited to the immediate areas of the proposed turbines, within the Development Site itself (and part of the Southern Uplands and Forestry: Enoch Hill LCA) due to the containment of coniferous forestry and landform. Landscape effects (None, increasing to Substantial / Moderate) would also extend north, approximately 2km (affecting the East Ayrshire Southern Uplands: Benty Cowan Hill LCA) due to the height of the northern most turbines appearing beyond the summits of Chang Hill and Benty Cowan Hill. Although this area is considered to be more sensitive (High to Medium) some of the effects would be mitigated with much of the lower parts of the turbines screened by intervening landform and forestry as indicated in Viewpoints 1 and 2. The nature of these effects would be temporary to long-term (reversible) direct and negative due primarily to the height and scale of the turbines."*

Magnitude and Level of Effect: during Operation

- 9.7.31 There would be no change from the ES assessment (**Chapter 9**) which is repeated as follows:
- 9.7.32 *"During operation, the completed wind farm would gain a more 'settled' appearance when compared to the same area during the construction period, although the significant landscape effects would continue throughout the operational period as a result of the proposed turbines and the change they would bring to the existing landscape character.*
- 9.7.33 *The landscape effects on the Southern Uplands and Forestry: Enoch Hill LCA would be **Substantial / Moderate** and significant due to the height and scale of the proposed turbines. The geographical extent of the significant effects would be limited to the immediate areas of the proposed turbines, within the Development Site itself (and part of the Southern Uplands and Forestry: Enoch Hill LCA) due to the containment of coniferous forestry and landform. Significant landscape effects (Substantial / Moderate) would also extend north, approximately 2km (affecting the East Ayrshire Southern Uplands: Benty Cowan Hill LCA) due to the upper parts of the turbines appearing beyond the summits of Chang Hill and Benty Cowan Hill. There would be a more limited geographical effect on the East Ayrshire Southern Uplands: Benty Cowan Hill LCA as a result of the Development Site access, access track, potential borrow pits and proposed compounds. The nature of all of these effects would be long-term (reversible, excepting access tracks) direct and negative due primarily to the height and scale of the turbines.*
- 9.7.34 *This effect would not be significant in terms of the wider East Ayrshire Southern Uplands (with or without forestry) including the area of Southern Uplands with Forests: Carsphairn, in Dumfries and Galloway."*
- 9.7.35 The primary and the additional effect of the Proposed Development would be **Substantial / Moderate** and significant, extending up to approximately 2km. The nature of these effects would be long-term (reversible), direct, cumulative and negative.

Cumulative Landscape Effects 1: Existing and Consented Wind Farms

- 9.7.36 There are no existing / under construction or consented wind farms within the Southern Uplands and Forestry: Enoch Hill LCA. The closest being the Windy Standard Wind Farm and Extension within Dumfries and Galloway (beyond 2km distance) and the Afton Wind Farm within the adjacent Southern Uplands, immediately to the west of Glen Afton (beyond 4km distance).
- 9.7.37 The cumulative effect of these wind farms on the host landscape character would not be significant due to the intervening distance and forestry (Low magnitude) although the wider combined visibility of the Windy Standard Group and Hare Hill Group (including Afton) indicates an increase in the characterising influence of wind farms and their association with the upland areas generally. In that

respect, the Proposed Development would not appear incongruous or create a 'new' landscape characteristic. The cumulative landscape effects on the Southern Uplands and Forestry: Enoch Hill LCA would be **Substantial / Moderate** and significant, extending out from the Development Site to approximately 2km, mainly affecting areas to the north. The nature of these effects would be long-term (reversible), direct, cumulative and negative.

9.7.38 Concerns raised by SNH are considered further as follows:

► Intensification of cumulative wind energy development:

The Proposed Development would not lead to an 'intensification' of wind energy development in the Southern Uplands with Forestry within East Ayrshire as this would be the first and only wind farm within this LCA. There would however, be a 'intensification' of wind energy development in the wider Southern Uplands and Southern Uplands with Forestry LTCs within 10km and the Proposed Development would represent a further group of wind farm development in addition to the Hare Hill and Windy Standard groups.

► Enclosing and encircling effects on the Upland Basin.

The addition of the Proposed Development would not 'enclose' the Upland Basin LCA, with visibility of cumulative wind farm development limited to the southern quadrant. By its nature the Upland Basin is an enclosed landscape, surrounded on all sides by more elevated landform (excepting the Upland River Valley of the River Nith).

The spread of other cumulative wind farm development within these areas of landscape character which surround the Upland Basin is illustrated in FEI **Figure 9.17**. It may be noted that apart from the existing / under construction Hare Hill Wind Farm and Extension there are no other existing / under construction or consented wind farms within the listed LCTs (Foothills with Forestry and Opencast Mining (17a) and East Ayrshire Plateau Moorland [18a]) that surround the Upland Basin.

Cumulative Landscape Effects 2: Existing and Consented and Application wind farms

9.7.39 The South Kyle application is located directly to the southwest of the Development Site straddling the East Ayrshire and Dumfries and Galloway border and partly within the Southern Uplands and Forestry: Enoch Hill LCA and partly within the Southern Uplands and Forests: Carsphairn LCA. The Benbrack application is located further to the southwest of the Proposed Development, beyond the South Kyle application at approximately 5km distance within Dumfries and Galloway. The Pencloe application is located to the southeast at a distance of approximately 1.9km. These three applications would have a strong characterising influence on the Southern Uplands and Forestry: Enoch Hill LCA (High magnitude within approximately 2km) which, combined with the Proposed Development, would lead to a significant effect (**Substantial / Moderate**) on the Southern Uplands and Forestry: Enoch Hill LCA, affecting all but the extreme western areas of this landscape within 4-5km of Dalmellington. The nature of these effects would be long-term (reversible), direct, cumulative and negative.

9.7.40 Concerns raised by SNH are considered further as follows:

► Intensification of cumulative wind energy development:

There would be an 'intensification' of wind energy development in the wider Southern Uplands and Southern Uplands with Forestry LTCs within 10km. The Proposed Development in combination with the other three applications and the existing and consented developments would add to a larger cluster of wind farm development joined together by the Pencloe, South Kyle and Windy Standard Extension. The geographical spread of this development, in particular resulting from the South Kyle application would lead to the characterisation of much of this part of the Carsphairn Forest as a 'wind farm landscape with forestry' landscape character type.

► Enclosing and encircling effects on the Upland Basin.

The spread of other cumulative wind farm development within these areas of landscape character which surround the Upland Basin is illustrated in **Figure 9.17**. The Hare Hill Group, Windy Standard Group (including Pencloe) and the South Kyle Group of applications (South Kyle, Benbrack and Enoch Hill) collectively form a mass of wind farm development that would be limited to the southern quadrant and could not physically enclose or encircle the Upland Basin alone.

The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to enclosure or encirclement of the Upland Basin, wind farm development would be visible in more than one direction from within the Upland Basin. The wider, more extensive views in other directions to the north, east and west would remain wind farm free.

Other wind farm applications such as Lethans and Polquhairn would have limited or no visibility from within the Upland Basin and would not further add to enclosure or encirclement.

Magnitude and Level of Effect: During Decommissioning

9.7.41 There would be no change from the ES assessment (**Chapter 9**) which is repeated as follows:

9.7.42 *"During the decommissioning period the Development Site would return to a construction site for a temporary period and as with the construction period, the level of effect would be variable over the Development Site and according to the phase of activity. In overall terms the magnitude would reduce from operational levels to Negligible magnitude with the removal of the turbines and associated above ground infrastructure (excepting on-site access tracks). The residual landscape effect would be **Slight / Negligible** and not significant. The nature of these effects would be permanent, direct, and positive when compared to the pre-existing landscape of the local area."*

Direct Landscape Effects: Southern Uplands: Benty Cowan Hill LCA

9.7.43 This assessment allows for the scenario that up to ten of the proposed turbines are located within the Southern Uplands: Benty Cowan Hill LCA as defined by the boundaries of the EALCS and as such provides an alternative assessment of the direct landscape effects.

9.7.44 The Southern Uplands: Benty Cowan Hill LCA forms part of an extensive area of East Ayrshire Southern Uplands LCT identified within the EALCS. The key characteristics of East Ayrshire Southern Uplands LCT, identified in that document are described as follows:

- ▶ *"Within East Ayrshire, the Southern Uplands form steep-sided, rugged open hills strongly containing the Upland Glen (14) of Glen Afton and providing a dramatic backdrop to the low-lying Upland Basin (15);*
- ▶ *Higher and particularly steep-sided and well-defined hills on the eastern edge of Glen Afton form landmark features and include the distinctly rugged Blackcraig Hill and Craigbraneoch Rig;*
- ▶ *Lower and relatively narrow ridges occur west of Glen Afton;*
- ▶ *Land cover is simple, dominated by grass moorland;*
- ▶ *This landscape is not settled although it is highly visible from settlement and roads within the Upland Basin (15) to the north;*
- ▶ *The peripheral hills of this character type also form prominent skylines seen from Glen Afton;*
- ▶ *The operational Hare Hill wind farm occupies a prominent hill summit seen in views to the north-west; and*
- ▶ *The operational wind farm of Windy Hill and its consented extension are also located within the same character type but within neighbouring Dumfries and Galloway and close to the East Ayrshire boundary."*

Landscape Sensitivity

- 9.7.45 The EALCS identifies the level of existing wind farm development as limiting the scope for further development with key constraints identified as the need to reduce intrusion on the adjacent settled Upland Basin (15) and the Upland Glen (14) of Glen Afton. Further potential concerns are expressed, relating to the intervisibility of different sized turbines and the potential for wind farm development to encircle the Upland Basin (15) due to cumulative wind farm development extending over the skylines of the Southern Uplands and the Foothills with Forest and Opencast Mining (17a) and the Plateau Moorlands (18a).
- 9.7.46 The EALCS identifies the East Ayrshire Southern Uplands as being of High-Medium landscape sensitivity with no scope for large scale turbine development.

Landscape Susceptibility and Value

- 9.7.47 At a detailed site level, a range of landscape criteria or indicators of sensitivity / susceptibility to wind energy development have been considered as set out in **Table 9.10**. They indicate that the Southern Uplands: Benty Cowan Hill LCA has a Medium to Low sensitivity in respect of its physical and perceptual criteria and Medium to High sensitivity in respect of the visual criteria and landscape value. An overall sensitivity of Medium is concluded, due mainly to the following factors:
 - ▶ The key characteristics of this LCA (large scale, gently undulating landform) indicate a Medium to Low overall sensitivity and susceptibility to the Proposed Development;
 - ▶ The presence of the Afton SLCA local landscape designation indicates Medium landscape value;
 - ▶ The condition and management of the landscape is considered to be reasonably good, although the landscape quality of this area in terms of its representativeness is considered to be Medium overall with the southern and northern edges partly transitional into adjacent areas of landscape character (Southern Uplands with Forestry and Upland Basin) which are less well representative of the LCT and further reduce its physical extent;
 - ▶ The main landscape element (grass moorland) which covers the Development Site area within this LCA is considered to be of Low landscape sensitivity;
 - ▶ In terms of settlement, the LCA is largely uninhabited with low levels of settlement occurring around the northern fringes and along the B741 to the north and there are also no particular tourist or recreational receptors, indicating Low sensitivity;
 - ▶ In terms of the surrounding landscape context, the Development Site is noted to be closely related as a 'backdrop' to the lowland settled landscape of the Upland Basin and associated receptors. In this respect a High - Medium sensitivity is noted.

Table 9.10 Landscape Susceptibility of the Southern Uplands: Benty Cowan Hill LCA

Landscape Attributes	Characteristics that are less susceptible to wind energy development			Characteristics that are more susceptible to wind energy development	
	Low	Medium – Low	Medium	High - Medium	High
Physical Characteristics:					
Scale	Larger scale landscapes and landform which may be more able to accommodate large scale wind turbines			Smaller scale well defined landforms which may become dominated or overwhelmed by wind turbines	
Landform and Topography	Simple upland plateau, gently rolling or flat landscapes as the turbines may be less easily scaled against the landform			Complex landforms with well defined changes in level including ridges, steep sloping hillsides and narrow valleys.	

Landscape Attributes	Characteristics that are less susceptible to wind energy development			Characteristics that are more susceptible to wind energy development	
	Low	Medium – Low	Medium	High - Medium	High
Land Cover	Large scale simple and homogenous land cover including moorland, grass lands, and large forestry plantations, where the simplicity of the land cover may complement turbines			Complex and diverse land cover including a diversity of arable fields, grassland, trees / hedges / woodland, open water of a small scale that turbines may dominate.	
Pattern	Unenclosed land or rectilinear field patterns which may complement the modern aesthetic of turbines.			Irregular small scale patchwork or medieval field patterns where turbines may overwhelm the scale and landscape pattern.	
Settlement pattern	Sparse or no settlement with relatively few visual receptors and scale indicators.			Populated areas and lowlands with larger numbers of visual receptors and small scale indicators.	
Other Development	Large scale industrial, infrastructure and mineral extraction land uses detracting from the overall landscape sensitivity and value. Landscapes with vertical masts, pylons and turbines			Rural / traditional forms of development including parks and gardens and monuments enhancing the overall landscape sensitivity and value.	
Change and Movement	Busy major roads and other areas of significant mechanised movement where the movement of turbine blades may be in character			No roads or only quiet country lanes where turbine blade movement could be eye catching	
Perceptual Characteristics:					
Wildness and Naturalness	Area not valued for wildness as a key characteristic or special quality.			Area valued for wildness as a key characteristic or special quality.	
Remoteness	Area that feels closer to people and human activities. Conversely, a remote area not valued for wildness or tranquility would have a lower number of visual receptors.			Area that feels remote from people and human activities. Conversely, landscapes that are settled / built up would have a higher number of visual receptors.	
Rational / Windswept	Open and exposed landscapes where turbines, though more visible, may be logically located on windswept locations.			Enclosed or sheltered landform likely to be of a smaller scale and limited rational for turbine locations.	
Visual Characteristics:					
Openness and Enclosure	Enclosed landscape with limited opportunities for long range views.			Open landscapes with opportunities for long range views.	
Skyline	Broad simple skylines lacking in distinctive or 'landmark' topography.			Skylines which are an important and noticeable component in the landscape with 'landmark' topography.	

Landscape Attributes	Characteristics that are less susceptible to wind energy development			Characteristics that are more susceptible to wind energy development	
	Low	Medium – Low	Medium	High - Medium	High
Landmarks	Landscapes with no sensitive landmark features where turbines might detract from settings			Landscapes with landmarks and features such as church spires and prominent listed buildings where turbines might compete as landscape foci and detract from settings	
Surrounding Context	Self-contained landscape with limited relationship with adjacent areas.			Landscapes that are closely connected to the adjacent / surrounding areas in terms of similar character or visual backdrop.	
Overall Susceptibility			Medium	Upland Basin	

9.7.48 Drawing from this assessment, the sensitivity of Southern Uplands: Benty Cowan Hill LCA could be assessed as Medium. In comparison, in the EALCS assessment, greater weight appears to have been given to the landscape context, landform and landmark topography noted in relation to Glen Afton, Blackcraig Hill (700m AOD in comparison to the 569m AOD at Enoch Hill) and the presence of other existing wind farm development, considered as a limiting factor rather than an opportunity. These factors are not particularly pertinent to the Development Site or this particular area of the Southern Uplands: Benty Cowan Hill LCA which is physically remote from Glen Afton and Blackcraig Hill. It should be noted that even if the sensitivity of this landscape were assessed as of High to Medium, in line with the EALCS, any revised assessment would not alter the overall conclusions regarding the identification of a significant effect on this landscape.

Magnitude and Level of Effect: during Construction

9.7.49 There would be no change from the magnitude and ultimate levels of effect reported in the ES (Chapter 9) for the assessment in relation to the Southern Uplands and Forestry: Enoch Hill LCA.

9.7.50 Overall, the magnitude of change would range from None to High as construction progresses and the landscape effects on the Southern Uplands: Benty Cowan Hill LCA would range from **None**, increasing to **Substantial / Moderate** and significant upon completion, due to the height and scale of the proposed turbines. The geographical extent of the significant effects would be limited to the immediate areas of the proposed turbines, within the Development Site itself and areas up to approximately 2-2.5km mainly to the northeast. Some of these effects would be partly mitigated with much of the lower parts of the proposed turbines screened by intervening landform and forestry as indicated in Viewpoints 1 and 2 (FEI Figures 9.27 and 9.28) . The nature of these effects would be temporary to long-term (reversible) direct and negative, due primarily to the height and scale of the turbines.

Magnitude and Level of Effect: during Operation

9.7.51 During operation, the magnitude of change would be High and the primary and additional landscape effects on the Southern Uplands: Benty Cowan Hill LCA would be **Substantial / Moderate** and significant. The geographical extent of the significant effects would extend to areas within approximately 2-2.5km, due to the slightly higher sensitivity of this landscape. The nature of these effects would be long-term (reversible), direct, cumulative and negative.

Cumulative Landscape Effects 1: Existing and Consented Wind Farms

9.7.52 There are no existing / under construction or consented wind farms within the Southern Uplands: Benty Cowan Hill LCA, although the Hare Hill Group, the single High Park Farm turbine and Afton

Wind Farm are located within the wider East Ayrshire Southern Uplands LCT. The Windy Standard Wind Farm and Extension is also visible within Dumfries and Galloway (approximately 2.5km distance).

9.7.53 The cumulative effect of these wind farms on the host landscape character would not be significant due to the intervening distance and forestry (Low Magnitude) although the wider combined visibility of the Windy Standard Group and Hare Hill Group (including Afton) indicates an increase in the characterising influence of wind farms and their association with the upland areas generally. In that respect the Proposed Development would not appear incongruous or create a 'new' landscape characteristic. The cumulative landscape effects on the Southern Uplands Benty Cowan Hill LCA would be **Substantial / Moderate** and significant, extending out from the Development Site to approximately 2-2.5km, mainly affecting areas to the north. The nature of these effects would be long-term (reversible), direct, cumulative and negative.

9.7.54 Three concerns raised by SNH are considered further as follows:

▶ Intensification of cumulative wind energy development in the Southern Uplands with Forestry:

The Proposed Development would lead to an 'intensification' of wind energy development in the Southern Uplands within East Ayrshire and the wider Southern Uplands and Southern Uplands with Forestry LTCs within 10km, as the Proposed Development would represent a third group of wind farm development in addition to the Hare Hill and Windy Standard groups.

▶ Enclosing and encircling effects on the Upland Basin.

The addition of the Proposed Development would not 'enclose' the Upland Basin LCA, with visibility of cumulative wind farm development limited to the southern quadrant. By its nature the Upland Basin is an enclosed landscape, surrounded on all sides by more elevated landform (excepting the Upland River Valley of the River Nith).

The spread of other cumulative wind farm development within these areas of landscape character which surround the Upland Basin is illustrated in FEI **Figure 9.17**. It may be noted that apart from the existing / under construction Hare Hill Wind Farm and Extension, there are no other existing / under construction or consented wind farms within the listed LCTs (Foothills with Forestry and Opencast Mining (17a) and East Ayrshire Plateau Moorland [18a]) that surround the Upland Basin.

Cumulative Landscape Effects 2: Existing and Consented and Application wind farms

9.7.55 There are no other wind farm applications within the East Ayrshire Southern Uplands: Benty Cowan Hill LCA or the wider East Ayrshire Southern Uplands LCT.

Magnitude and Level of Effect: During Decommissioning

9.7.56 There would be no change from the ES assessment described previously (**Chapter 9**) in relation to the Southern Uplands with Forestry: Enoch Hill LCA.

Indirect Effects on the Surrounding Landscape Character

9.7.57 Each of the surrounding LCAs located within 10km of the Proposed Development has been assessed in **Table 9.11**. The assessment has included those wind farms illustrated on FEI **Figure 9.17**.

9.7.58 In summary, this part of the assessment has concluded that there would be no significant, indirect effects on the surrounding landscape character as a result of the Proposed Development. This is due mainly to the size and scale of the host LCT which acts as a buffer around the Proposed Development, separating it from adjacent areas of more sensitive landscape character. Whilst there would be significant visual effects on the views from the Upland Basin LCA to the north, views of the Proposed Development would not be so widespread or sufficiently influential as to significantly change or affect the existing landscape character which includes existing wind farm development.

9.7.59

There would however be a significant cumulative landscape effect on the Upland Basin, accounting for other farm applications (South Kyle, Pencloe and Garleffan) which would be visible from this area. Although there would be an intensification of wind farm development visible within the southern quadrant, this could not physically ‘enclose’ or ‘encircle’ the Upland Basin alone. The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to enclosure or encirclement of the Upland Basin, wind farm development would be visible in more than one direction from within the Upland Basin. The wider, more extensive views in other directions to the north, east and west would remain wind farm free.

Table 9.11 Indirect Effects on Surrounding Landscape Character within 10km

Landscape Character Area (LCA)	Landscape Assessment
East Ayrshire Windfarm Landscape Capacity Study (EALCS, 2013)	
<p>Upland Basin: New Cumnock (15)</p>	<p><i>The Upland Basin: New Cumnock LCA forms a low-lying, small-scale landscape, at the head of the upper Nith Valley, which is encircled by surrounding hills with the Southern Uplands to the south, the Foothills with Forest and Opencast Mining to the west, and the East Ayrshire Plateau Moorlands to the north.</i></p> <p><i>FEI Figure 9.17 indicates a large area of the Upland Basin which contains substantial areas of on-going open-cast mining which has changed the topography and landscape character of this area.</i></p> <p><i>The landscape sensitivity of the Upland Basin to wind farm development located within it is considered to be High by the EALCS. However, the western areas have been strongly influenced by open-cast mining, reducing the landscape sensitivity to wind farm development due to its unsettled nature and the extent of large scale earthworks changing the topography and character of this part of the LCA. Other areas of this landscape include areas of recovered mining and have higher levels of intervening vegetation screening as at Knockshinnock Lagoons, or include built up areas and woodland in the form of roadside trees, shelter belts, riverside woodland and copses that provide some screening of wider views from the lower lying areas of the Upland Basin. Wider and more open views are available from more elevated areas of the Upland Basin particularly along the edges, being viewed at longer distances, with wide panoramas across the Upland Basin towards the enclosing hills. Due to the nature of these larger scale views with greater intervening distances, the screening levels from more lowland areas, and the effects of existing and past open cast mining, the landscape sensitivity of the Upland Basin: New Cumnock to the Proposed Development is considered to be Medium.</i></p> <p><u>Assessment: Proposed Development</u></p> <p><i>The Proposed Development would be located approximately 2-3km to the south of the LCA with the most distant part of the Upland Basin extending to 9-9.5km distance in the north. The ZTV coverage within this area is widespread, although within approximately 2-3km distance, visibility of the Proposed Development would be limited by intervening topography and, from elsewhere within the LCA, theoretical visibility would often be reduced by intervening vegetation screening.</i></p> <p><i>Viewpoints 2, 4, 5, and 7 are located within this LCA, although 2, 4, and 5 are not particularly representative and illustrate the views from locations of maximum visibility, ranging from 3-7km distance. Much of this area and the associated southern views are already partly characterised by views of Hare Hill and Windy Standard Wind Farms and the Proposed Development would not appear incongruous in that respect, or otherwise significantly affect the overall rural character of this area. The Proposed Development would however, be clearly visible in the southern views of the Southern Uplands from this area, where there are clear and open views in that direction. Views in other directions approaching from the south and southwest would not be affected</i></p> <p><i>The magnitude of change would be Medium and the addition of the Proposed Development would lead to a Moderate primary effect which would not be significant. The Proposed Development would not add a ‘new’ characteristic feature to the southern horizon in terms of landscape character or otherwise significantly change or affect the landscape character of this area, although there would be significant visual effects on views from some locations. The nature of these effects would be long-term (reversible) indirect and negative.</i></p> <p><u>Cumulative Assessment: Proposed Development + Existing + Consented Sites</u></p> <p><i>There are no other existing or consented wind farms within this LCA. Other wind farm development including Hare Hill and Extension (Low magnitude), Afton and Windy Standard (Negligible magnitude) would be, or are visible from this area and have a characterising influence on the southern horizons, the effect of which is Slight and not significant.</i></p>

Landscape Character Area (LCA)	Landscape Assessment
	<p><i>The Proposed Development (Medium magnitude) would not lead to a further significant additional effect and the combined cumulative effect of the existing, consented and Proposed Development would be Moderate and not significant. The nature of these effects would be long-term (reversible) indirect cumulative and negative.</i></p> <p><i>Enclosing and encircling effects on the Upland Basin:</i></p> <ul style="list-style-type: none"> ▶ <i>The addition of the Proposed Development would not ‘enclose’ or ‘encircle’ the Upland Basin LCA, with visibility of cumulative wind farm development limited to the southern quadrant. By its nature the Upland Basin is an enclosed landscape, surrounded on all sides by more elevated landform (excepting the Upland River Valley of the River Nith).</i> <p><u><i>Cumulative Assessment: Proposed Development + Existing + Consented + Applications</i></u></p> <p><i>There are no other wind farm applications within this LCA.</i></p> <p><i>Other wind farm applications (South Kyle, Pencloe and Garleffan) would be visible from the Upland Basin and further reinforce the appearance of wind farm development on the surrounding horizons (ranging from Medium to Low magnitude). The Proposed Development (Medium magnitude) would not lead to a further significant additional effect. However, the combined cumulative magnitude of change would be High to Medium and the level of effect would be Substantial / Moderate and significant. The nature of these effects would be long-term (reversible) indirect and negative.</i></p> <p><i>Enclosing and encircling effects on the Upland Basin:</i></p> <ul style="list-style-type: none"> ▶ <i>The spread of other cumulative wind farm development, including the ‘Hare Hill Group’, ‘Windy Standard Group’ (including Pencloe) and the ‘South Kyle Group’ of applications (South Kyle, Benbrack and the Proposed Development) would be limited to the southern quadrant and could not physically enclose or encircle the Upland Basin alone.</i> ▶ <i>The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to enclosure or encirclement of the Upland Basin, wind farm development would be visible in more than one direction from within the Upland Basin. The wider, more extensive views in other directions to the north, east and west would remain wind farm free.</i>

Landscape Designations: Afton SLCA

- 9.7.60 The revised assessment reports no change to the ES assessment (**Chapter 9**).
- 9.7.61 The vast majority of the Development Site, including all of the proposed turbines, would be located within the locally designated Afton Sensitive Landscape Character Area (SLCA). The area covers the entire Afton valley as well as the Muirkirk Uplands area to the north of the A76.
- 9.7.62 SLCA are designated within the Ayrshire Joint Structure Plan (2007) to “provide protection for high quality landscapes”. The Development Site and south western edge of the SLCA, is noted from the site surveys to be within sight and sound of open cast mining and overlooks the varied, settled landscape of the Upland Basin which includes a mix of agricultural, forestry, mining, wind farm development and settlement, appearing as a ‘working rural landscape’.
- 9.7.63 As part of their Local Development Plan: Proposed Plan (2015), EAC undertook a review of SLCA in East Ayrshire formalised in the *Background Paper: Sensitive Landscape Areas’ (March 2015)*. Table 1 of this document describes the “Characteristics and Sensitivities of the Landscape Character Areas included within the Sensitive Landscape Area” describing the key characteristics and why the area is sensitive. The document notes the increased presence of wind farm development and re-confirms the local landscape designation.
- 9.7.64 The document defines the key qualities of the East Ayrshire Southern Uplands LCT and the East Ayrshire Southern Uplands with Forestry LCT which warranted their inclusion within the SLCA as follows: the “well defined, steep-sided hills on the eastern edge of Glen Afton, Blackcraig and Craigbraneoch” are “important landmark features” which provide “spectacular views” and which

include the area of Southern Uplands to the east of Glen Afton as an important area for recreation and hillwalking; the eastern edge of the 'Southern Uplands with Forestry' to provide "*an important buffer between Glen Afton and the non-forested section of the Southern Uplands, and helps provide a logical boundary to the Sensitive Landscape Area*"; and, "*the steep sided, rugged open hills of the Southern Uplands form a dramatic backdrop to the adjacent low-lying upland basin, and form an important part of East Ayrshire's southern skyline*".

- 9.7.65 The blade tip ZTV for the Proposed Development (FEI **Figure 9.2**) is almost constant within 2km of the Proposed Development with fragments where there is no theoretical visibility beyond Maneight Hill, Strandlud Hill, Ewe Hill, Hillend Hill and Stony Knowes Hill. Thereafter, theoretical visibility becomes increasingly more fragmentary and is present along the west-facing slopes of the East Ayrshire Southern Uplands to the east of the Development Site such as those of The Knipe (575m) and Blackcraig Hill (700m), and on the southern slopes of Muirkirk Uplands to the north of the A76. Elsewhere in the SLCA there is fragmented theoretical visibility on facing slopes and hill summits at higher elevations.
- 9.7.66 Much of the sensitivity of the SLCA, within which the Proposed Development is located is determined by potential effects on the Glen Afton valley. Analysis of the ZTV, confirmed by field survey, has determined that the Proposed Development would have little to no effect on the Glen Afton valley landscape due to the lack of visibility of the proposed turbines. Whilst there would be some views from the summits of landmark hills (Blackcraig Hill) there are no particular opportunities to view the Proposed Development against these landmark features and so the qualities of these, which are described as, "*well defined, steep-sided hills*" would not be affected.
- 9.7.67 Similarly, whilst limited sequential views of the Proposed Development may be available to the west of the summits of Blackcraig Hill, Hare Hill and Laglass Hill, there would be no visibility to the east of these summits within the wider area of this part of the East Ayrshire Southern Uplands. It is not considered that the extent of available views would affect the overall experience of walking in the landscape.
- 9.7.68 Although there would be a significant effect on part of the landscape character within the Afton SLCA, the site area and adjacent landscape is not a noted in the document as part of the special quality of the SLCA. As noted in the field survey notes in FEI **Appendix 9.D**, the landscape has weakened perceptions of tranquillity and wildness as a result of open cast mining and wind farm development. Whilst certain views available from the "*adjacent low-lying upland basin*" towards the "*backdrop of the Southern Uplands*" would be significantly affected (for example, Viewpoint 4: New Cumnock Cemetery (FEI **Figure 9.30**) and Viewpoint 7 Lochside Hotel [FEI **Figure 9.33**]) field survey has confirmed, where visible, that the Proposed Development would be experienced in a wide visual context or panorama.
- 9.7.69 Although there would be a significant effect on part of the landscape character within the Afton SLCA, it is not considered that the special qualities of the SLCA, its integrity or the reasons for its designation would be significantly affected, and there would be little or no visibility from within the Afton Glen area itself, which forms the focus of the SLCA in this area. The magnitude of change is assessed as Low and the primary level of effect on the SLCA would be **Moderate** and not significant. The nature of these effects would be indirect, long-term (reversible), negative to neutral, and cumulative.

Cumulative Assessment: Proposed Development + Existing + Consented Sites within 10km

- 9.7.70 There would be successive views with the existing Hare Hill scheme to the northeast (Medium to Low magnitude) at a distance of approximately 4km, with the existing Windy Standard scheme to the southwest (Low magnitude) at a distance of approximately 6.25km.
- 9.7.71 There would be simultaneous views with the consented Windy Standard Extension (Negligible magnitude) Afton Wind Farm (Medium magnitude) and the Sanquhar Six Wind Farm (Low magnitude).
- 9.7.72 The additional level of effect of the Proposed Development on the SLCA would be **Moderate** and not significant.

- 9.7.73 The combined cumulative magnitude of these wind farms, including the Proposed Development is assessed as Medium, due to the Afton Wind Farm, leading to a significant baseline effect (**Substantial / Moderate**) which already occurs or is occurring on part of the SLCA, including Afton Glen due to other multiple developments. It is not however, considered that the special qualities of the SLCA would be significantly affected beyond the baseline assessed in EAC's *Background Paper: Sensitive Landscape Areas in 2015*.

Cumulative Assessment: Proposed Development + Existing + Consented + Applications

- 9.7.74 There would be simultaneous views with the South Kyle application site (Low magnitude), the Pencloe application site (Medium to Low magnitude) and the Benbrack application site (Negligible magnitude) to the southwest. There would be successive views of the Garleffan scheme to the northwest (Low magnitude).
- 9.7.75 The additional level of effect of the Proposed Development on the SLCA would be **Moderate** and not significant.
- 9.7.76 The combined magnitude of these wind farms is assessed as Medium, leading to a significant effect (**Substantial / Moderate**) on part of the SLCA, including Afton Glen due to multiple wind farm developments and mainly due to Afton and Pencloe. It is considered that the special qualities of the SLCA would not be significantly affected beyond the baseline assessed in EAC's *Background Paper: Sensitive Landscape Areas, dated 2015* as the main change to the landscape is caused by the Afton Wind Farm, with other developments located more remotely from the key focus and areas of special quality around Glen Afton.

9.8 Residual Visual Effects

- 9.8.1 The visual assessment draws from the site visits and viewpoint analysis (FEI **Appendices 9.B and 9.D**) and assesses the potential visual effects on views and visual amenity likely to be experienced by receptors (people) within the landscape. The visual assessment has been set out as follows:
- ▶ Visual Effects during Construction, Operation and Decommissioning;
 - ▶ Visual Effects on Views from Settlements and Residential Properties;
 - ▶ Visual Effects on Views from Transport Routes;
 - ▶ Visual Effects on Views from Recreational Routes; and
 - ▶ Visual Effects on Views from Recreational and Tourist Destinations.

Visual Effects during Construction, Operation and Decommissioning

- 9.8.2 In general terms, visual effects associated with the construction phase would increase from zero at the start of construction and progressively increase until completion and the operational phase of the Proposed Development.
- 9.8.3 During operation, the appearance of the Development Site would recover a 'calmer' visual character with negligible levels of maintenance activity visible on-site from the nearest visual receptors. It is during this period that the majority of significant visual effects would be experienced as a result of the proposed turbines. This is discussed in detail in relation to each of the visual receptor groups within the remainder of this chapter.
- 9.8.4 During decommissioning the wind farm would return to a construction site for a temporary period and the level of visual effect would gradually reduce with the removal of the turbines and the control building and substation compound, thus rendering the visual effects of the Proposed Development as predominantly reversible and not significant on completion of decommissioning. The internal tracks and Development Site access would remain as permanent features for use by the landowner, but would 'grass over' subject to the level of use. In overall terms, the level of

visual effect would reduce to non-significant levels (Negligible magnitude) and the nature of these effects would be permanent, direct, and neutral.

Visual Receptors: Settlements and Residential Properties

- 9.8.5 Settlement within 10km of the Proposed Development, defined by the EAC Local Plan and DGC LDP, has been included in the assessment and identified on FEI **Figure 9.22**. The visual effects likely to be experienced from settlements include consideration of residential areas, the public realm, and public open spaces within the settlement boundaries that would be frequented by people.
- 9.8.6 A Residential Visual Amenity Assessment has been included for those properties within 3km as illustrated in FEI **Figure 9.23a** and this is detailed in FEI **Appendix 9.C**.
- 9.8.7 The sensitivity of all residential receptors and settlements has been assessed as *High*.

Visual Effects on Views from Settlements

- 9.8.8 There are seven settlements overlapped to varying extents by the blade tip ZTV within 10km of the Proposed Development which are included in the assessment. Although just beyond 10km, an assessment of the visual effects from Cumnock has been included as a result of the consultation response from EAC. The assessment is reported in **Table 9.12**.
- 9.8.9 In summary, there would be significant visual effects on some views from two settlements at Burnside and along the southwest edge of New Cumnock at Connel View and the Cemetery. Where visible, the visual effects of the Proposed Development would be proportionate to the large scale landscape in the view and would not visually dominate the views from settlements (including the public realm and related public open spaces) or residential properties as a result of any predicted landscape or visual effects.
- 9.8.10 Further wireframe analysis and site survey has confirmed that there would be No View from the settlement of Dalmellington.
- 9.8.11 The SNH consultation response expressed concerns about the encirclement of settlements at Dalmellington and New Cumnock. In practice there would be No View from the settlement of Dalmellington and limited visibility of the Proposed Development from the A713 approach road along the River Doon, Upland River Valley. As such the contribution of the Proposed Development to any perceived encirclement of Dalmellington would be limited and not significant.
- 9.8.12 In respect of New Cumnock, the spread of other cumulative wind farm development, including the Hare Hill Group, Windy Standard Group (including Pencloe) and the South Kyle Group of applications (South Kyle, Benbrack and Enoch Hill) would be limited to the southern quadrant and could not physically enclose or encircle the settlement of New Cumnock. The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to enclosure or encirclement of the settlement of New Cumnock, wind farm development would be visible in mainly two, opposing directions from within the Upland Basin (see pie chart diagram on page 5 of Landscape and Design Statement - FEI **Appendix 9.A**). Wider, more extensive views in other directions to the north, east and west would remain wind farm free.
- 9.8.13 There would be no significant visual effects on the views from Cumnock which was included in the assessment as a result of the consultation response from EAC.

Residential Visual Amenity Assessment

- 9.8.14 A Residential Visual Amenity Assessment is detailed in FEI **Appendix 9.C**. In summary it may be noted that none of the 24 residential properties included in the assessment (including the group of 8 properties in Dalleagles Terrace) would experience a significant visual effect as a result of the Proposed Development from the ground floor main living areas or main garden areas.
- 9.8.15 No residential properties would be affected in terms of their residential visual amenity.

9.8.16 This assessment may be further summarised as follows:

- ▶ There are no residential properties within 0-2km of the proposed turbines;
- ▶ There are 24 residential properties within the 3km study area which have been included in the assessment as a precaution. Of these, four² would be at least moderately, but not significantly affected by the Proposed Development, whilst 16 would experience a slight effect and four would have no view of the Proposed Development; and
- ▶ Within the wider vicinity there are two further residential properties just beyond 3km, but these would not be significantly affected.

Table 9.12 Visual Effects on Views from Settlements

Settlement	Description of Effect
Burnside	<p><i>Burnside is a collection of approximately 15 houses to the southwest of New Cumnock along the B741 at a distance of approximately 3.2km to the northeast of the nearest turbine. The settlement could be described as having a north-facing aspect, located as it is to the 'foot' of the Southern Uplands further to the south. ES Viewpoint 2: B741 South West of New Cumnock (FEI Figure 9.28a/b/c/d) is located at a distance of approximately 160m to the southwest of Burnside and the level of effect in relation to that viewpoint is assessed as Substantial to Substantial / Moderate and Significant.</i></p> <p><i>The blade tip ZTV indicates that Burnside residents would potentially view between 13 and 16 turbines, although in practice visibility from the settlement would be restricted to the areas of south-western views up-hill, towards the slopes of the Southern Uplands and the Proposed Development, which are not otherwise obstructed by buildings, local landform and vegetation. The wireframe indicates that the Proposed Development would be visible across the horizon with approximately 9 hubs visible. Field survey confirmed that a number of intervening telegraph poles and lamp posts would be visible from Burnside at close range and would appear 'larger' in comparison to the turbines due to the effects of perspective. The magnitude of visual change experienced by residents would be High to Medium. The primary visual effect on Burnside would be Substantial to Substantial / Moderate and significant and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be successive views with the existing High Park Farm wind turbine to the east at a distance of approximately 4km although the magnitude of change would be Negligible to Zero and the contribution would not be significant. The existing Hare Hill Wind Farm (Negligible magnitude of change) and the consented Hare Hill Extension Wind Farm (Negligible magnitude of change) will also be visible in a successive view at a distance of approximately 5.7km and 7km respectively although the contribution would not be significant.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Substantial to Substantial / Moderate and significant;</i> ▶ <i>The combined cumulative level of effect would be Substantial to Substantial / Moderate and significant and in this respect there would be no change to the assessment.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with the South Kyle application site to the south (Low magnitude of change). There would also be successive views with Garleffan application scheme (Low magnitude of change) to the north at a distance of approximately 7km. In addition, Lethans application scheme would be visible in a successive view to the northeast at a distance of approximately 9km although the magnitude of change would be Negligible and the contribution would not be significant.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Substantial to Substantial / Moderate and significant;</i> ▶ <i>The combined cumulative level of effect would be Substantial to Substantial / Moderate and significant and in this respect there would be no change to the assessment.</i>

² Two of these properties are involved with the application.

Settlement	Description of Effect
<p>Bankglen</p>	<p><i>Bankglen (also spelt Bank Glen) is a small rural settlement in East Ayrshire located to the southwest of New Cumnock along the B741 at a distance of approximately 4.8km to the northeast of the nearest turbine.</i></p> <p><i>The blade tip ZTV indicates that residents would potentially view between 13 and 16 turbines. In practice, visibility from the settlement would be restricted to the areas where views towards the Proposed Development are not obstructed by buildings, localised landform and vegetation, such as Glen Park.</i></p> <p><i>Wireframes indicate that the Proposed Development would be visible across the horizon with approximately 16 hubs visible. Field survey confirmed that roadside and garden vegetation would screen the majority of views from this settlement. The magnitude of visual change experienced by residents would range from Zero to Low. The primary visual effect on Bankglen would range from No View to Moderate and not significant and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be simultaneous views with the existing Windy Standard Wind Farm and the consented Windy Standard Extension (Phase II) Wind Farm to the south (both Negligible magnitude of change) at a distance of approximately 9.2km and 8.1km respectively. There will be successive views with the consented Afton Wind Farm to the south at a distance of approximately 6.6km (Low magnitude of change). The existing High Park Farm wind turbine (Low magnitude of change) and the existing Hare Hill Wind Farm (Low to Negligible magnitude of change) to the east will also be visible in a successive view at a distance of approximately 2.8km and 4.9km respectively, although the contribution would not be significant. There would also be successive theoretical views of the Mansfield Mains and Taiglim Farm single turbines (Negligible magnitude) although in practice these are most likely to be screened from view.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant;</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect there would be no change to the assessment.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with the South Kyle application site (Low magnitude of change) and Pencloe application site (Low magnitude of change) to the south at a distance of approximately 4.6km and 5.3km respectively. There would also be successive theoretical views with Garleffan and Lethans applications (both Low magnitude) to the north.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant;</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect there would be no change to the assessment.</i>
<p>Connel Park</p>	<p><i>Connel Park is a small rural settlement in East Ayrshire located to the southwest of New Cumnock on the B741 at a distance of approximately 5.1km to the northeast of the nearest turbine.</i></p> <p><i>The blade tip ZTV indicates that residents would potentially view between 13 and 16 turbines, although in practice visibility from the settlement would be restricted to the areas where views towards the Proposed Development are not obstructed by buildings, local landform and vegetation.</i></p> <p><i>Wireframes indicate that the Proposed Development would be visible across the horizon with approximately 11 to 14 hubs visible. The magnitude of visual change experienced by residents would range from Low to Zero. The primary visual effect on Connel Park would range from Moderate to No View and not significant and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be simultaneous views with the consented Afton Wind Farm (Low magnitude of change) at a distance of approximately 6.8km. The existing High Park Farm Wind Turbine (Low magnitude of change) and the existing Hare Hill Wind Farm (Negligible magnitude of change) will also be visible in a successive view to the southeast at a distance of approximately 2.2km and 4km respectively, although the contribution would not be significant due largely to the screening of intervening landform. There would also be successive theoretical views of the Mansfield Mains and Taiglim Farm single turbines (Negligible magnitude), although in practice these are most likely to be screened from view.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant;</i>

Settlement	Description of Effect
	<ul style="list-style-type: none"> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect, there would be no change to the assessment.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with Pencloe application site (Low magnitude of change) to the south and the South Kyle application (Low magnitude of change) to the southwest at a distance of approximately 5km and 7km respectively. There would also be successive views with Taiglim Farm Wind Turbine (Negligible magnitude) and Garleffan applications (Low to Negligible magnitude) to the north at a distance of approximately 3.5km and 4.5km respectively. The Lethans application would be visible in a successive view to the east at approximately 6.7km distance (Low to Negligible magnitude).</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant.</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect, there would be no change to the assessment.</i>
<p>Leggate</p>	<p><i>Leggate is a small rural settlement in East Ayrshire located immediately to the northeast of Connel Park on the B741 at a distance of approximately 5.5km to the northeast of the nearest turbine.</i></p> <p><i>The blade tip ZTV indicates that residents would potentially view between 13 and 16 turbines, although in practice visibility from the settlement would be restricted to the areas where views towards the Proposed Development are not obstructed by buildings, local landform and vegetation. Wireframes indicate that the Proposed Development would be visible across the horizon with approximately 15 hubs visible. Field survey confirms that built form, roadside vegetation and blocks of dense woodland south and west of Knockshinnoch Farm would screen the majority of views. The magnitude of visual change experienced by residents would range from Zero to Low. The primary visual effect on the views from Leggate would range from No View to Moderate and not significant and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be simultaneous views with the consented Afton Wind Farm (Low magnitude of change) at a distance of approximately 6.8km. The existing High Park Farm Wind Turbine (Low magnitude of change) and the existing Hare Hill Wind Farm (Negligible magnitude of change) will also be visible in a successive view to the southeast at a distance of approximately 2.2km and 4km respectively although the contribution would not be significant, due largely to the screening of intervening landform. There would also be successive theoretical views of the Mansfield Mains and Taiglim Farm single turbines (Negligible magnitude), although in practice these are most likely to be screened from view.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant.</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect, there would be no change to the assessment.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with Pencloe application site (Low magnitude of change) to the south and the South Kyle application (Low magnitude of change) to the southwest at a distance of approximately 5km and 7km respectively. There would also be successive views with Taiglim Farm Wind Turbine (Negligible magnitude) and Garleffan applications (Low to Negligible magnitude) to the north at a distance of approximately 3.5km and 4.5km respectively. The Lethans application would be visible in a successive view to the east at approximately 6.7km distance (Low to Negligible magnitude).</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate and not significant.</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant and in this respect there would be no change to the assessment.</i>

Settlement	Description of Effect
<p>New Cumnock</p>	<p><i>New Cumnock is a small town located along the A76 trunk road south of Cumnock at a distance of approximately 6.2km to the northeast of the nearest turbine. The settlement is located at the 'foot' of the Southern Uplands with a north facing aspect, viewing across the Upland Basin to the north.</i></p> <p><i>The ES assessment viewpoint 4: New Cumnock Cemetery (Figure 9.30a/b/c/d) is located in close vicinity to New Cumnock at a distance of approximately 6.2km from the nearest turbine. The level of effect is assessed as Substantial / Moderate to Moderate and significant.</i></p> <p><i>The blade tip ZTV for New Cumnock indicates that residents would potentially view between zero and 16 turbines. In practice visibility from the settlement would be restricted to the areas on the south western edges of the settlement, viewing across the lower slopes of the Southern Uplands where views towards the Proposed Development are not obstructed by buildings, local landform and vegetation.</i></p> <p><i>Wireframes indicate that the Proposed Development would be visible across the horizon. The magnitude of visual change experienced by residents would be Low to Zero. With the areas of highest visibility affecting the views from Connel View and the Cemetery (Medium magnitude). The primary visual effect on the views from New Cumnock would be Moderate to No View and not significant. There would however be significant visual effects on the views from Connel View and the Cemetery Substantial / Moderate and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be simultaneous views with the consented Afton Wind Farm (Low to Negligible magnitude), the existing Windy Standard Wind Farm (Negligible magnitude) and the consented Windy Standard Extension (Phase II) Wind Farm to the south (Negligible magnitude) at a distance of approximately 6.4km, 9.5km and 8.7km respectively. There will be successive views with consented Mansfield Mains wind turbine (Negligible magnitude of change) and Glenmuckloch to the northeast at a distance of approximately 18.4km respectively. The existing High Park Farm wind turbine (Low magnitude) and the existing Hare Hill Wind Farm (Low to Negligible magnitude of change) will also be visible in a successive view to the southeast at a distance of approximately 1.6km and 3.7km respectively although the contribution would not be significant.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate to No View and not significant with significant visual effects from Connel View and the Cemetery Substantial / Moderate.</i> ▶ <i>The combined cumulative level of effect would be Moderate to No View and not significant with significant visual effects from Connel View and the Cemetery Substantial / Moderate.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with Pencloe application site (Medium to Low magnitude) to the south and South Kyle application site (Low magnitude) to the southwest at a distance of approximately 5.2km and 7.8km respectively. There would also be successive views with the Garleffan application (Medium magnitude) to the north at a distance of approximately 3.4km and the Lethans application (Low magnitude) theoretically visible in a successive view to the east at a distance of approximately 6km.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Moderate to No View and not significant with significant visual effects from Connel View and the Cemetery Substantial / Moderate.</i> ▶ <i>The combined cumulative level of effect would be Substantial / Moderate. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i> <p><i>The SNH consultation response expressed concerns about the encirclement of New Cumnock.</i></p> <p><i>The spread of other cumulative wind farm development, including the Hare Hill Group, Windy Standard Group (including Pencloe) and the South Kyle Group of applications (South Kyle, Benbrack and Enoch Hill) would be limited to the southern quadrant and could not physically enclose or encircle the settlement of New Cumnock. The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to the enclosure or encirclement of the settlement of New Cumnock, wind farm development would be visible in mainly two, opposing directions from within the Upland Basin. Wider, more extensive views in other directions to the north, east and west would remain wind farm free.</i></p>

Settlement	Description of Effect
<p>Dalmellington</p>	<p><i>Dalmellington is East Ayrshire’s southernmost town. It is located at the junction of the B741 and the A713 Galloway Tourist Route and lies at a distance of approximately 7km to the west of the Proposed Development.</i></p> <p><i>The nearest ES assessment viewpoint to Dalmellington is Viewpoint 9: Bogton Loch (Figure 9.35a/b/c/d), though this is not representative of the views from the town.</i></p> <p><i>The blade tip ZTV indicates that views of the Proposed Development would only be available from the northern edges of the town, with the vast majority of the area outwith the ZTV. Whilst potentially between 1 and 12 turbines would be visible from Dalmellington, further wireframe analysis and site survey indicates that that in practice, there would be No View of the Proposed Development from this settlement.</i></p> <p><i>The SNH consultation response expressed concerns about the potential for cumulative wind energy development to encircle Dalmellington. In practice there would be No View from the settlement and limited visibility of the Proposed Development from the A713 approach road along the River Doon, Upland River Valley. As such, the contribution of the Proposed Development to any perceived encirclement of Dalmellington would be limited and not significant.</i></p>
<p>Burnton</p>	<p><i>Burnton is a small village located north of Dalmellington at a distance of approximately 7.5km to the west of the nearest turbine.</i></p> <p><i>The blade tip ZTV indicates that residents would theoretically view between 1 and 12 turbines, although in practice, visibility from the village would be restricted to east facing views from the edge of the settlement, towards the Proposed Development which are not otherwise obstructed by buildings, local landform and vegetation. Further wireframe analysis and site survey indicates that the magnitude of change visible from this location would be Negligible and the primary visual effect on the views from Burnton would be Slight to No View and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be successive views with the consented Dersalloch Wind Farm to the west at a distance of approximately 4.2km (Low magnitude).</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Slight to No View and not significant.</i> ▶ <i>The combined cumulative level of effect would be Moderate and not significant.</i> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous views with South Kyle and potentially Benbrack applications (Low magnitude) to the southwest at a distance of approximately 4.9km. There would also be successive views with Keirs Hill Wind Farm (Medium magnitude of change) to the west at a distance of approximately 4km.</i></p> <ul style="list-style-type: none"> ▶ <i>The additional level of effect brought about by the Proposed Development would be Slight to No View and not significant.</i> ▶ <i>The combined cumulative level of effect would be Substantial / Moderate and significant due to Keirs Hill Wind Farm and the nature of these effects would be long-term (reversible), indirect, cumulative and negative to neutral.</i>
<p>Cumnock</p>	<p><i>Cumnock is a settlement in East Ayrshire located at the junction of the A76 and the A70, approximately 10.5km to the north of the nearest proposed turbine.</i></p> <p><i>The blade tip ZTV indicates that there would be theoretical visibility of between 1 and 16 turbines, with the ZTV overlapping the area predominantly to the north of the B7083 (Glaisnock Street). Wireframe analysis from this area reveals that there would be some partial landform screening of the turbine bases and hubs, whilst site survey confirms that in the majority of cases, the views would be screened further or completely by buildings, other built form and vegetation within the settlement.</i></p> <p><i>The Cumnock settlement has been sub-divided into areas overlapped by the ZTV to complete the assessment in more detail.</i></p> <ul style="list-style-type: none"> ▶ <i>Cumnock: Netherthird Area: At the southern end of the settlement, in the area of Netherthird, which includes Cumnock Business Park, Thistle Business Park South, Netherthird Primary School and residential areas. Wireframe analysis indicates that there would be theoretical visibility of up to 16 turbines, the bases of which would be partly screened by landform.</i>

Settlement	Description of Effect
	<p><i>In reality, the screening effects of buildings including large industrial units and two-storey houses would block views from the majority of this area with reduced or partial screening likely in the Craigens Road area (Negligible magnitude to No View).</i></p> <ul style="list-style-type: none"> ▶ <i>Cumnock: Area north of Caponacre Bridge: Barshare Wood, an area of recreational parkland, is located to the north of Netherthird and Caponacre Bridge and the majority of this area would be screened by forestry and trees. The residential area to the north of Barshare Wood is largely outwith the ZTV, with some theoretical visibility of turbine blades from the area of Glaisnock Street / the B7083 (Negligible magnitude). To the east of the B7083 there would be further theoretical visibility from the area of Patrick Finn Court, McCall Avenue, Wylie Crescent and Michie Street, although in reality these views would be wholly or partly screened by buildings (Negligible magnitude to No View).</i> ▶ <i>Cumnock: Barrhill Road Area: The ZTV indicates theoretical visibility of up to 16 turbines in residential areas to the north and south of Barrhill Road. Field survey and wireframes confirm that there may be occasional views of the Proposed Development, between buildings and partially screened by landform and vegetation at approximately 12km from the closest properties to the nearest turbine (Low magnitude to No View).</i> ▶ <i>Cumnock: Holmhead Area: Holmhead is the northernmost area of the settlement and the ZTV indicates theoretical visibility of up to 16 turbines at a distance of approximately 12.5km from the closest properties to the nearest turbine. Field survey and wireframes confirm that the majority of views would be screened by landform, buildings and woodland / forestry to the north of Lugar Water (Negligible magnitude to No View).</i>
	<p><i>Most of Cumnock is outwith the ZTV and would have No View of the Proposed Development. Of the remaining area, the visibility of the Proposed Development would be very limited and the overall magnitude of change experienced by residents would be Negligible, while the primary visual effect on views from Cumnock would be Slight and not significant. The nature of these effects would be long-term (reversible), indirect and negative.</i></p> <p><u><i>Existing + Consented Sites + Proposed Development</i></u></p> <p><i>There would be simultaneous visibility of the existing Hare Hill High Park Farm, and Windy Standard Wind Farms (Negligible magnitude) and the consented Afton and Windy Standard Extension (Negligible magnitude). Each of these wind farms would appear largely at a distance beyond the horizon line and the combined magnitude of change would be Negligible.</i></p> <p><i>The additional effect of the Proposed Development would be Slight and the combined cumulative effect would be Slight and not significant, with all wind farms affecting the same angle of view to the south. The nature of these effects would be long-term (reversible), indirect, cumulative and neutral to negative.</i></p> <p><u><i>Existing + Consented Sites + Applications + Proposed Development</i></u></p> <p><i>There would be simultaneous visibility of the Pencloe and South Kyle applications (Negligible to Low magnitude). Collectively these wind farms would appear within the same angle of view to the south. There would also be successive theoretical visibility of the Garleffan application ~3km to the east of Cumnock (Medium to Zero magnitude).</i></p> <p><i>The additional effect of the Proposed Development would be Slight and the combined cumulative effect would be Slight and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and neutral to negative.</i></p>

Visual Effects on Views from Transport Routes

9.8.17 This section of the assessment considers the visual effects on the views from transport routes within the Study Area illustrated on FEI **Figure 9.20**, as set out in **Table 9.13** and listed as follows:

Within the 10km Study Area:

- ▶ A and B Class Roads:

- ▶ A76 between Cumnock and Burnton east of New Cumnock (this section of the route has been assessed in detail);
- ▶ A713 Galloway Tourist Route between Waterside and Dalmellington (the road is outwith ZTV further south);
- ▶ B741 between Auchenroy and New Cumnock (this route has been assessed in detail); and
- ▶ Glasgow to Carlisle railway line near New Cumnock.

9.8.18 The views from these routes would be experienced sequentially and transiently by road users (mainly drivers and where appropriate cyclists and walkers) and railway passengers who would experience the Proposed Development as part of the changing sequence of views experienced from the route. The sensitivity of these receptors is considered to be medium, except for the A713 Galloway Tourist Route, which has been assessed as of High sensitivity due to its status as a National Tourist Route.

9.8.19 In summary, there would be significant visual effects on the views from one road, the B741 within approximately 4.5km of the Proposed Development, affecting the views intermittent over a distance of approximately 2km in total.

9.8.20 None of the other transport routes would be significantly affected by views of the Proposed Development. The Proposed Development would be visible from the A76 when approaching New Cumnock from the north and east within the 10km study area. These views would be experienced intermittently and transiently, from a moving position, experienced as part of a much wider context, with the views restricted to southbound road users travelling at speed, and for these reasons the visual effects are not assessed as significant.

Table 9.13 Visual Effects on Views from Transport Routes

Transport Route	Description of Effect
<p>A76 between Cumnock New Cumnock / Burns Heritage Trail</p>	<p><i>The section of A76 / Burns Heritage Trail within a 10km radius of the Proposed Development has been assessed in detail between Cumnock and Burnton east of New Cumnock as illustrated in FEI Figures 9.25a-f. The sensitivity of this route is considered to be Medium and it should be noted that there are no Burns Heritage features of interest to stop at along this part of the route.</i></p> <p><i>This section of the route within 10km is approximately 8.8km in length and there would be widespread theoretical visibility of the Proposed Development, however, in reality, intervening vegetation, roadside cuttings and built form would reduce this as detailed below. Any potential views of the Proposed Development would be experienced obliquely when travelling southeast and south from Cumnock towards New Cumnock at a distance of between approximately 6.4 and 10km from the Proposed Development.</i></p> <p><i>The overall magnitude of change would range from Medium to Zero and the overall level of effect would range from Moderate to No View and not significant. The nature of these effects would be long-term (reversible), cumulative, indirect, cumulative and negative to neutral.</i></p> <p><i>Each of the revised sequential viewpoints illustrated in Figures 9.25a-f are described as part of the assessment as follows:</i></p> <p><u><i>Sequential Viewpoints 1 and 2: east of New Cumnock.</i></u></p> <p><i>Travelling west from the edge of the 10km study area there would be theoretical visibility between Burnton and West Polquhirter, although this would amount to blade tip visibility which would in practice be screened by roadside vegetation and dry stone walls. There would be no theoretical visibility between West Polquhirter and the eastern edge of New Cumnock. The magnitude of change between the edge of the study area and New Cumnock would be Zero resulting in No View.</i></p> <p><u><i>Sequential Viewpoints 3 and 4: New Cumnock.</i></u></p> <p><i>There would be widespread theoretical visibility along the A76 through most of New Cumnock, however, the vast majority of views from the route within New Cumnock would be entirely screened by the built form and garden vegetation. Glimpses of the Proposed Development may be available from the section of the route near New Cumnock train station.</i></p>

Transport Route	Description of Effect
	<p><i>The magnitude of change within New Cumnock would range from Zero to Low and the level of effect would range from None to Slight and not significant. It may be noted that visual composition of the Proposed Development in this view has improved and the horizontal extent reduced.</i></p> <p><i>The remainder of the route within 10km would experience views of the Proposed Development, where available, but only when travelling southeast from Cumnock towards New Cumnock.</i></p> <p><u>Sequential Viewpoint 10: south of Cumnock.</u></p> <p><i>Travelling southeast from Cumnock, the Proposed Development is theoretically visible for a length of approximately 1.2km from the southern edges of Cumnock (near the minor road to Logan) to Boreland by the reservoirs. There would be occasional screening by roadside vegetation and built form, but in general clear or partial views of the Proposed Development would be available across the horizon at a distance of between approximately 10km and 9.6km. The magnitude of change from the section of the route south of Cumnock would range from Zero to Low and the level of effect would range from No View to Slight and not significant. It may be noted that visual composition of the Proposed Development in this view has improved and the horizontal extent reduced.</i></p> <p><u>Sequential Viewpoints 5 to 9: northwest of New Cumnock.</u></p> <p><i>From Borland there is no visibility for approximately 300m. Beyond this, the Proposed Development is theoretically visible for approximately 5.8km up to where it reaches New Cumnock. Within that stretch of road, intermittent, clear views, of the Proposed Development would be available when not screened by the roadside vegetation, cuttings and built form at distances of between 9.1km and 6.4km. The magnitude of change would range from Zero to Medium and the level of effect would range from No View to Moderate and not significant. It may be noted that visual composition of the Proposed Development in this view has improved and the horizontal extent reduced.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>The existing High Park Wind Turbine would be simultaneously visible from many sections of the route to the east of New Cumnock (Medium to Low magnitude). The existing Windy Standard Wind Farm and the consented Windy Standard Extension (both Negligible magnitude) and Afton Wind Farm (Low to Negligible magnitude) would often be visible in a simultaneous view. The existing Hare Hill Wind Farm and extension would also be visible in the successive view (Low to Negligible magnitude). The consented Glenmuckloch, Mansfield Mains and Taigim Farm Wind Turbine would also be theoretically visible in successive views (Negligible magnitude of change).</i></p> <p><i>The additional effect of the Proposed Development would be Moderate to No View and the combined cumulative effect would be Moderate to No View and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></p> <p><i>The South Kyle and Pencloe applications would be simultaneously visible in proximity to the Proposed Development (Medium to Low magnitude). The Garleffan application would occasionally be visible in successive views (Medium magnitude) and the Lethans application would also be visible in successive views (Negligible magnitude). The cumulative level of effect would be Substantial / Moderate and significant due to Garleffan.</i></p> <p><i>The additional effect of the Proposed Development would be Moderate to No View and the combined cumulative effect would increase to Substantial / Moderate and significant due to multiple developments, notably the Garleffan application. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>
<p>A713 Galloway Tourist Route between Waterside and Dalmellington</p>	<p><i>The Galloway Tourist Route is a national tourist route from the A74(M) to Ayr, running across the southern part of Dumfriesshire and eastern Kirkcudbrightshire before heading north through Galloway. The route is approximately 154.5km long. The sensitivity of this route as a promoted tourist route is considered to be High.</i></p> <p><i>There would be theoretical visibility of the Proposed Development at between 10km and 8.5km distance affecting the views from the stretch of road between Waterside and Dalmellington. Site survey confirms that roadside vegetation and forestry would screen the majority of the potential views of the Proposed Development in the east. The overall magnitude of change would range from Zero to Low and the level of effect would range from Moderate to No View and not significant. The nature of these effects would be long-term (reversible), cumulative, indirect and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>Dersalloch Wind Farm would be visible in the successive view (Negligible magnitude). The additional effect of the Proposed Development would be Moderate to No View and the combined cumulative effect would remain Moderate to No View and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>

Transport Route	Description of Effect
	<p><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></p> <p>The South Kyle, Pencloe and Benbrack application schemes (all Low to Negligible magnitude) may be simultaneously visible in proximity to the Proposed Development. There would be successive views of Keirs Hill (High magnitude).</p> <p>The additional effect of the Proposed Development would be Moderate to No View and the combined cumulative effect would increase to Substantial to No View and significant due to multiple developments, notably the Keirs Hill application which would affect views in the opposite direction further to the west. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>B741 between Auchenroy and New Cumnock</p>	<p>The section of this route within a 10km radius of the Proposed Development is approximately 18km in length and has been assessed in detail between Auchenroy to the west of Dalmellington and New Cumnock as illustrated in Figures 9.24a-f.</p> <p>Visibility of the Proposed Development along this route would tend to be limited to the upper parts of the turbines, experienced intermittently and obliquely from a moving position along the road and subject to further intermittent screening from vegetation and built form at between an approximately 2-10km distance. The sensitivity of this route is considered to be Medium.</p> <p>The overall magnitude of change would range from Zero to High and the overall level of effect would range from No View to Substantial / Moderate and significant. The significant effects would only arise along intermittent lengths of approximately 2km where there are clear views from within approximately 4.5km of the Proposed Development, largely only affecting the areas around Burnside and New Cumnock. The nature of these effects would be long-term (reversible), cumulative, indirect and negative.</p> <p><u>Sequential Viewpoints 1 to 4: Auchenroy to Dalmellington:</u></p> <p>Travelling east from Auchenroy towards Dalmellington, the route would be within the blade tip ZTV for approximately 2km. All of the proposed turbines would be theoretically visible for approximately 550m along the road at a distance of between approximately 10km and 9.5km, although roadside vegetation would screen most views in the summer months. The magnitude of change would range from Low to Negligible and the level of effect from Slight to Slight / Negligible and not significant. At this point the B741 follows the route of the A713 Galloway Tourist Route (assessed above) southeast to Dalmellington for about 650m.</p> <p><u>Sequential Viewpoints 5 to 10: Dalmellington to the new Electrical Substation:</u></p> <p>There would be No View of the Proposed Development from this section of the route due to the screening effects of vegetation and roadside trees and woodland, increasing to Slight / Negligible in the event of forestry felling.</p> <p><u>Sequential Viewpoints 11 to 12: from the new Electrical Substation Meiklehill:</u></p> <p>There would be No View of the Proposed Development from this section of the route due to the screening effects of forestry. However, in the event of forestry felling the Proposed Development would be theoretically visible, with up to 16 of the upper parts of the turbines visible at approximately 2-3km. The magnitude of change within this stretch would range from Medium to Negligible and the level of effect would range from Moderate to Slight / Negligible and not significant.</p> <p><u>Sequential Viewpoints 13 to 14: Meiklehill to Polmathburn Bridge:</u></p> <p>The route of the B741 would be outwith the ZTV between Nith Lodge and Maneight Farm for a distance of approximately 830m. From Maneight Farm there would be theoretical visibility of the Proposed Development (Low to Negligible magnitude) reducing further as the forestry matures.</p> <p>FEI Viewpoint 1 is located beyond this point near Polmathburn Bridge and represents a significant visual effect on the views from approximately 350m of the B741, viewing up to 11 turbines to the southeast at approximately 1.9km distance. Beyond this point the turbines would gradually disappear behind the intervening Peat Hill. The magnitude of change within this 350m stretch would range from Medium to Negligible and the level of effect from Moderate and not significant.</p> <p><u>Sequential Viewpoints 15 to 16: west of Knockburnie to Marshallmark:</u></p> <p>The road would be outwith the ZTV for approximately 1.1km with some partial visibility as illustrated at Sequential Viewpoint 15. Apart from the built form and associated roadside vegetation at Knockburnie there would be nothing else to screen the views. The magnitude of change within this stretch would be Medium where turbines are visible, and the level of effect would be Moderate and not significant.</p> <p>There would be No View from Sequential Viewpoint 16.</p>

Transport Route	Description of Effect
	<p><u>Sequential Viewpoints 17 to 20: Marshallmark to Bankglen.</u></p> <p>Riparian woodland along Dalleagles Burn, Straid Burn and Redhall Burn, as well as built form at Dalleagles and Straid Farm, with associated vegetation, would screen most views of the Proposed Development allowing only brief and occasional glimpses of the upper parts of turbines.</p> <p>Travelling southwest, clear views would be available from a short stretch of the road southwest of Burnside. FEI Viewpoint 2: B741 Southwest of New Cumnock is located at this point and the upper parts of the turbines at approximately 3km to 3.4km. Built form would screen most views from Burnside, however clear open views at mid-range (4km) would be available from the elevated section of the road northeast of Burnside around Cascaya and south of Bankglen for approximately 2km when travelling southwest. The magnitude of change would be High to Medium and the level of effect would be Substantial / Moderate to Moderate and significant.</p> <p><u>Sequential Viewpoints 21 to 22: Bankglen to New Cumnock.</u></p> <p>There is theoretical visibility between New Cumnock and Bankglen when travelling southwest. Views from the outskirts of New Cumnock and the settlements of Leggate, Connel Park and Bankglen would be limited to occasional glimpses of the proposed turbines at distances between 5km and 6.4km due to intervening built form and vegetation. In between the settlements, clear and open views of the Proposed Development would be available but at distances (of between approximately 5km and 6.4km). The magnitude of change within this stretch of the route would range from Medium to Negligible and the level of effect from Moderate to Slight / Negligible and not significant.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>No existing or consented wind farm development would be simultaneously visible within close proximity to the Proposed Development as illustrated in the sequential views. The existing Windy Standard Wind Farm and the consented Windy Standard Extension and Afton schemes may occasionally be simultaneously visible to the south from a short section of the B741 to the southwest of New Cumnock (magnitude Low to Negligible). The existing High Park Farm Wind Turbine, Hare Hill Wind Farm and Bankend Rig Wind Farm, as well as the consented Dersalloch Wind Farm, Mansfield Mains wind turbines and Hare Hill Extension Wind Farm would also be visible in successive views from this route (all Low to Zero magnitude).</p> <p>The additional effect of the Proposed Development would be Substantial / Moderate to No View and the combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></p> <p>The South Kyle application scheme would be frequently simultaneously visible in proximity to the Proposed Development. From most sections, this neighbouring scheme (Zero to Medium magnitude of change) is visible in front of, or behind, as well as to the side of the Proposed Development additionally extending the horizontal angle of view. The Pencloe application scheme would occasionally be visible in a simultaneous view with the Proposed Development (Zero to Medium magnitude of change). The Polquhairn, Penbreck, Lethans, Taiglim, and Linburn Farm (all Negligible to Zero magnitude of change) applications may also be theoretically visible in successive views.</p> <p>The additional effect of the Proposed Development would be Substantial / Moderate to No View and the combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Glasgow to Carlisle Railway Line</p>	<p>The Glasgow to Carlisle railway line is located to the northeast of the Proposed Development at a distance of approximately 7.2km at its closest point. The ZTV analysis indicates that the majority of the route within the 10km study area is within the blade tip ZTV, with up to 16 turbines theoretically visible from most sections of the route. Clear, open views of the Proposed Development would be available from much of this part of the route. In practice, the Proposed Development would only be viewed by rail passengers viewing from sections of the railway line that would be broadly perpendicular to the Proposed Development and not subject to the intervening screening of landform, cuttings, vegetation and built form. The magnitude of change would range from Medium to Zero and the overall level of effect would range from Moderate and not significant to No View. The nature of these effects would be long-term (reversible), cumulative, indirect, cumulative and negative to neutral.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>The existing High Park Wind Turbine would be simultaneously visible to the east of New Cumnock (Low magnitude). The existing Windy Standard Wind Farm and the consented Windy Standard Extension (both Negligible magnitude) and Afton Wind Farm (Low to Negligible magnitude) would also be potentially visible in a simultaneous view. The existing Hare Hill Wind Farm and the consented Hare Hill extension Wind Farm and Sanquhar Wind Farm would be visible in the successive view (Low to Negligible magnitude) The Taiglim consented wind turbine would also be visible in successive views (Negligible magnitude).</p>

Transport Route	Description of Effect
	<p><i>The additional effect of the Proposed Development would be Moderate to No View and the combined cumulative effect would also be Moderate to No View and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><i><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></i></p> <p><i>The South Kyle and Pencloe applications would be theoretically simultaneously visible in proximity to the Proposed Development (Zero to Medium magnitude). The Garleffan application scheme would also be theoretically visible the opposite direction (High magnitude of change) and the Lethans application would be theoretically visible in successive views (Negligible magnitude of change).</i></p> <p><i>The additional effect of the Proposed Development would be Moderate to No View, whilst the combined cumulative effect would also be Substantial / Moderate to No View and significant due to the Garleffan application. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>

Visual Receptors: Recreational Routes

9.8.21 The visual assessment has considered the potential visual effects likely to be experienced by people on recreational routes and includes National Cycle Routes (NCR), Core Paths, Rights of Way, Heritage Paths and Scottish Hill Tracks. All of these route assessments consider the cumulative sequential effects of other wind farms (existing, consented and applications). The sensitivity of the receptors on these routes (walkers, cyclists, horse riders and joggers) has been assessed as High. Those routes included in the assessment are illustrated in FEI Figures 9.20 and 9.21, assessed in Table 9.14 and listed as follows:

- ▶ Core Paths and Rights of Way included in the revised assessment:
 - ▶ DGC Core Path No. 667: Water of Deugh Trail;
 - ▶ EAC Core Path No. C12: New Cumnock Circular; and
 - ▶ Rights of Way (numbered ‘a-g’ on FEI Figure 9.21) including one which is routed within the Development Site.
- ▶ Heritage Paths and Scottish Hill Tracks:
 - ▶ Heritage Path and Scottish Hill Track 84: Afton Road (also part Core Path C10: Coalfield Cycle Route); and
 - ▶ Scottish Hill Tracks - 81: Barr to Dalmellington and 78b: Glen Trool Village to Dalmellington by Tunskeen.

9.8.22 In summary, significant visual effects would affect views from part of two local recreational routes and two Rights of Way including one which is routed within the Development Site as follows:

- ▶ EAC Core Path No. C12: New Cumnock Circular affecting the majority of the 6.2km route near Cascaya, Lanemark and Hungry Hill;
- ▶ Heritage Path and Scottish Hill Track No 84: Afton Road (also part Core Path C10: Coalfield Cycle Route) affecting ~625m of the route; and
- ▶ Rights of Way, including:
 - ▶ Route d: which accesses the Development Site; and
 - ▶ Route e: which is similar to part of the New Cumnock Community Paths network and the visual effects from this part of the route would be similar to FEI Viewpoint 4: New Cumnock Cemetery (FEI Figure 9.30) and significant.

- 9.8.23 Further Rights of Way are otherwise compromised by opencast mining (routes a, b and c) or routed partly through existing wind farm development (Route f) and as a consequence would not be significantly affected by the Proposed Development.
- 9.8.24 There would be no significant visual effects resulting from the Proposed Development on the views from long distant routes or NCRs.

Table 9.14 Visual Effects on Views from Recreational Routes within 5km and 10km

Local Recreational Route	Description of Effect
Core Paths and Rights of Way	
<p>DGC Core Path No. 667 Water of Deugh Trail</p>	<p><i>The DGC Core Path 667 is formed mostly by forest roads and is a circular route in the Carsphairn Forest of approximately 7.8km length.</i></p> <p><i>The route is located at a distance of approximately 2.8km at its closest point. FEI Viewpoint 3: Core Path 667 Water of Deugh (Figure 9.29a/b/c/d) illustrates the views from a short stretch of the core path where clear views are available at approximately 4.5km distance from the Proposed Development. The rest of the route runs almost entirely through coniferous forestry and only glimpses of the Proposed Development would be visible in the midst of dense forestry. Views are largely screened by coniferous woodland and/or are outwith the ZTV.</i></p> <p><i>The magnitude of change would range from Zero to Negligible, increasing slightly subject to forestry felling and re-stocking and the level of effect would range from No View to Slight and not significant. The nature of these effects would be long-term (reversible), cumulative, indirect and neutral.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There may be simultaneous views of the consented Afton Wind Farm (Negligible to Zero magnitude, increasing to Low magnitude subject to forestry felling). There may be successive views of the existing Windy Standard Wind Farm (Negligible to Zero magnitude, increasing to Low magnitude subject to forestry felling) and the consented Windy Standard Extension (Negligible to Zero magnitude, increasing to Low magnitude subject to forestry felling).</i></p> <p><i>The additional effect of the Proposed Development would range from Slight to No View and the combined cumulative effect would also be Slight to No View, increasing to Moderate subject to forestry felling and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There may be simultaneous views of South Kyle (Medium to Zero magnitude, increasing to High magnitude subject to forestry felling and re-stocking) and Pencloe (Negligible to Zero magnitude, increasing to Low magnitude subject to forestry felling).</i></p> <p><i>The additional effect of the Proposed Development would range from Slight to No View. The combined cumulative effect would be Substantial to No View and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>
<p>EAC Core Path No. C12: New Cumnock Circular</p>	<p><i>The EAC Core Path 12 is located at a distance of approximately 3.9km at its closest point. It starts at the junction of the B741 with Boig Road west of New Cumnock (beyond the 5km study area) and follows a loop round the southern edges of Bankglen, then through Cascaya, Lanemark, Hungry Hill before re-joining the B741 back at Bankglen.</i></p> <p><i>The ZTV analysis suggests that views of the Proposed Development would be available from the entire route within 5km. In practice, the built form and vegetation would screen the views from Bankglen, but clear open views of the Proposed Development would be available from the majority of the route. The magnitude of change would range from Zero to Medium and the level of visual effect would range from Substantial / Moderate and significant to No View. The nature of these effects would be long-term (reversible) indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There will be simultaneous views with Windy Standard Wind Farm and Extension to the south (both Low to Negligible magnitude of change) at a distance of approximately 8.2 and 7km respectively. Afton Wind Farm would also be visible to the south at a distance of approximately 6km (Low magnitude of change).</i></p> <p><i>The existing High Park Farm Wind Turbine (Low magnitude of change) and the existing Hare Hill Wind Farm and Extension (Low to Negligible magnitude of change) would be visible to the south east in a successive views at a distance of approximately 2.8km and 5km respectively, although the contribution would not be significant.</i></p>

Local Recreational Route	Description of Effect
	<p><i>Mansfield Mains would also be theoretically visible in the successive views to the northeast at a distance of approximately 4.2km (Negligible magnitude of change). There would also be successive views with the consented Taiglim Farm Wind Turbine (Negligible magnitude of change).</i></p> <p><i>The additional effect of the Proposed Development would range from Substantial / Moderate to No View and significant. The combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>In theory, there would be simultaneous views of the South Kyle and Pencloe applications (Medium to Low magnitude) to the south and southwest at distances of approximately 5.4km and 4km respectively. There would also be successive theoretical views of the Taiglim Farm Wind Turbine (Negligible magnitude of change) and the Garleffan application (Medium magnitude of change) to the north at a distance of approximately 4.2km and 5.2km respectively. The Lethans application would be theoretically visible in a successive views to the east at approximately 7.3km distance (Negligible magnitude).</i></p> <p><i>The additional effects of the Proposed Development would range from Substantial / Moderate to No View and significant. The combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>
Rights of Way	<p><i>A total of seven Rights of Way are indicated on the Core Path Plans within 5km of the Proposed Development as illustrated in Figure 9.21. The sensitivity of these routes is assessed as High unless otherwise noted according to their use and condition.</i></p> <p><i>One of these (Route d) is partially within the Development Site and comes to within 1km of the nearest proposed turbines. The route is not signposted from its starting point on the B741 near Dalleagles School House and is routed south along a farm track and the valley of the Dalleagles Burn, continuing south through unenclosed land along the Trough Burn. The Proposed Development would be clearly visible at close range (High magnitude) and the level of effect would be Substantial and significant. Other wind farm development likely to be visible from this route includes the Hare Hill and Windy Standard Groups as well as the single turbine at High Park Farm and the South Kyle group of applications which include Pencloe.</i></p> <p><i>The additional effects of the Proposed Development would be Substantial and significant. The combined cumulative effect would also be Substantial and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><i>Non-motorised public access of the internal access tracks of the Proposed Development would not be restricted and people accessing the Development Site would be able to use these to complete circular routes in a similar and beneficial manner to that which has frequently occurred at other wind farm sites.</i></p> <p><i>A summary assessment of the remaining six routes is provided as follows:</i></p> <ul style="list-style-type: none"> ▶ <i>Routes a and b: These are located within coniferous forestry to the northwest, at between 2.5 and 5km distance from the Proposed Development. Both are 'dead-end' routes leading north to areas of existing opencast mining and, as a consequence, the use and quality of these routes indicates a Low sensitivity. Visibility of the Proposed Development is likely to range from High magnitude to No View where screened by forestry and level of effect would be Moderate to No View and not significant.</i> ▶ <i>Route c: is compromised by existing opencast mining and due to the reduced access, and amenity value it would not be significantly affected.</i> ▶ <i>Route e: Connects Afton Road with Core Path C12, but is not signposted and does not appear to be well used. Part of the New Cumnock Community Paths network is located further north near the Cemetery which is signposted and well used (High sensitivity). The views from either of these routes would be similar to the views illustrated in FEI Viewpoint 4: New Cumnock Cemetery (Figure 9.30a/b/c/d) although this view is more elevated. The magnitude of change would range from Low to Medium and the level of effect would range from Substantial / Moderate to Moderate and significant.</i> ▶ <i>Route f and g: Both of these routes are largely outwith the ZTV and / or are routed through forestry. Wireframe analysis, which discounts the forestry, indicates limited visibility (Negligible magnitude). There would be a clear view of the Proposed Development from the</i>

Local Recreational Route	Description of Effect
	<p>open summit of Struther's Brae, although that part of the route would be dominated by the consented / under construction Afton Wind Farm.</p> <p>As a result, the additional effects would range from Slight to Moderate and not significant due to the limited visibility of the Proposed Development and the Afton Wind Farm.</p> <p>► Route h: is outwith the ZTV indicating No View of the Proposed Development. As a result there would be no visual effects on the views experienced from this route.</p>
Heritage Paths and Scottish Hill Tracks	
<p>Heritage Path and Scottish Hill Track 84: Afton Road (also part Core Path C10: Coalfield Cycle Route)</p>	<p>Afton Road overlaps with three local recreational routes which include a Heritage Path (Old Road from New Cumnock to Dalquhairn), Scottish Hill Track No. 84 (New Cumnock to St Johns Town of Dalry by Glen Afton) and Core Path C10: Coalfield Cycle Route.</p> <p>Much of the Afton Road and the above routes are outwith the ZTV to the south of Laight Farm and the Burns Memorial there would be No View from the main part of these routes within Glen Afton.</p> <p>Intermittent visibility of the Proposed Development would occur along sections of Afton Road, immediately south of New Cumnock (approximately 125m) and adjacent to the Cemetery (approximately 500m). Other areas of theoretical visibility indicated by the ZTV have been assessed on site and confirmed to be screened by either buildings or vegetation. FEI Viewpoint 4: New Cumnock Cemetery (Figure 9.30a/b/c/d) is representative of an elevated view from this section of the route. The magnitude of change is assessed as Medium and the level of effect would range from No View to Substantial / Moderate and significant.</p> <p>The overall magnitude of change would be Medium to Zero and the level of effect would range from Substantial / Moderate to No View and significant for an overall length of approximately 625m of the route. The nature of these effects would be long-term (reversible), cumulative, indirect and negative to neutral.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>Windy Standard Wind Farm and Extension and Afton Wind Farm would be occasionally simultaneously visible to the south at approximately 7km to 9.5km distance (Negligible magnitude). The existing High Park Farm Wind Turbine (Medium magnitude) the existing Hare Hill Wind Farm (Low magnitude) and the consented Mansfield Mains Wind Turbine (Negligible magnitude) may be visible in successive views.</p> <p>The additional effects of the Proposed Development would range from Substantial / Moderate to No View and significant. The combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></p> <p>The South Kyle application would be simultaneously visible at 7.5km with the Proposed Development (Low magnitude) as well as the Pencloe application at 5km to the southwest (Medium magnitude). The Lethans application would be theoretically visible, successively at 6km to the northeast (Low magnitude), and Garleffan would be theoretically visible, successively at 4.6km to the northeast (Medium magnitude). Windy Rig would be theoretically visible at 12km to the south (Negligible magnitude).</p> <p>The additional effects of the Proposed Development would range from Substantial / Moderate to No View and significant. The combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Scottish Hill Track No. 81: Barr to Dalmellington and No. 78b: Glen Trool Village to Dalmellington by Tunskeen</p>	<p>The Scottish Hill Track Nos. 81 and 78b are located at a distance of approximately 8.5km to the southwest of the Proposed Development. The sequential viewpoints from the B741 assessment (Nos. 2, 3 and 4) illustrate the views from part of this track overlapping with the B741. The magnitude of change along this section of the route, overlapping with the B741, would range from Low to Negligible and the level of effect from Moderate to Slight and not significant.</p> <p>The remaining section of this route is routed along a minor road leading to Dalcairney Farm and Dalcairney Waterfall and 2km of the route, between the B741 and the farm is overlapped by the ZTV indicating theoretical visibility of up to 12 turbines. In reality, roadside vegetation, including mature trees and woodland within the Craigengillan estate would wholly or partly screen the Proposed Development. The magnitude of change along this section of the route would range from Negligible to Zero and the level of effect from Slight to No View and not significant. The nature of these effects would be long-term (reversible) indirect, cumulative and negative to neutral.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p>

Local Recreational Route	Description of Effect
	<p><i>Little or no existing or consented wind farm development would be simultaneously or successively visible within proximity to the Proposed Development.</i></p> <p><u>Cumulative Assessment: + Existing + Consented Sites + Applications</u></p> <p><i>The South Kyle application would be simultaneously visible in proximity to the Proposed Development (Zero to Negligible magnitude). The Benbrack and Keirs Hill applications may also be theoretically visible in successive views (Zero to Negligible magnitude).</i></p> <p><i>The additional effects of the Proposed Development would range from Moderate to Slight. The combined cumulative effect would also be Moderate to Slight and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>

Visual Effects on Views from Recreational and Tourist Destinations

- 9.8.25 Beyond the local recreational routes listed above there are few outdoor recreational and tourist attractions within the local area and the 10km radius Study Area that overlaps with the blade tip ZTV. Recreational and tourist destinations within the 10km radius Study Area are assessed in **Table 9.15**. The sensitivity of the receptors has been assessed as High.
- 9.8.26 In summary, the Proposed Development would be significantly visible from the Knockshinnoch Lagoons Local Nature Reserve (although views from the north/north-eastern parts would benefit from increased screening during the summer) and the summits of Blackcraig Hill and Windy Standard, both of which are already close to the Hare Hill and Windy Standard wind farm groups.

Table 9.15 Visual Effects on Views from Recreational and Tourist Destinations (within 10km)

Recreational and Tourist Destinations	Description of Effect
<p>Knockshinnoch Lagoons</p>	<p><i>Knockshinnoch Lagoons is a former coal mining / lagoon area which has been allowed to re-vegetate. The lagoons and birch woodland provide wetland habitat for breeding and wintering birds and woodland wildlife habitats. The area is open to the public throughout the year and can be accessed from both the B741 close to Connel Park and from Castlehill Road off the A76 and via the New Cumnock Community Paths network.</i></p> <p><i>The blade tip ZTV indicates theoretical visibility of the Proposed Development throughout the site. However, some of the potential views (especially in the north and north eastern parts of the reserve) would be screened, particularly in the summer months, by intervening woodland. Built form at New Cumnock and Connell Park would also provide some further screening. The magnitude of change is assessed as Medium to Zero where views are available. The level of effect would range from Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible) cumulative, indirect and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p><i>There would be simultaneous views with the consented Afton Wind Farm (Low to Negligible magnitude) and the existing Windy Standard Wind Farm and Extension (Negligible magnitude) to the south at a distance of approximately 7km to 10km respectively. There would be successive views of the consented Mansfield Mains Wind Turbine (Negligible magnitude) at a distance of approximately 3km. The High Park Farm Wind Turbine (Low to Negligible magnitude) and the existing Hare Hill Wind Farm (Low to Negligible magnitude) would also be visible in a successive view to the southeast at approximately 2km and 4.5km distance respectively.</i></p> <p><i>The additional effects of the Proposed Development would range from Substantial / Moderate to No View. The combined cumulative effect would also be Substantial / Moderate to No View and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p><i>There would be simultaneous theoretical visibility of the Pencloe application to the south (Medium to Low magnitude) and the South Kyle application to the southwest (Low magnitude) at approximately 6km and 8km distance respectively. There would be simultaneous theoretical visibility of Windy Rig to the south at a distance of 13km (Negligible magnitude). There would also be successive theoretical visibility of the consented Taiglim Farm Wind Turbine (Negligible magnitude) and the Garleffan application (Medium magnitude) to the north at</i></p>

Recreational and Tourist Destinations	Description of Effect
	<p>approximately 4km and 3.5km distance respectively. There would be successive theoretical visibility of the Lethans application to the east at approximately 6km distance (Low magnitude).</p> <p>The additional effects of the Proposed Development would range from Substantial / Moderate to No View. The combined cumulative effect would also be Substantial / Moderate to No View and significant, due to multiple wind farm developments including Garleffan, and Pencloe. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Craigengillan GDL</p>	<p>The Craigengillan Garden and Designed Landscape (GDL) is set amidst the hills of the Southern Uplands. It was first established as an estate in 1580, when it encompassed over 30,000 acres and stretched as far as Carsphairn. The estate changed hands in early 2000 and the new owner embarked on a restoration programme to encourage public access and to protect and enhance the landscape and the nature conservation interest. It is open year round for various activities. The main house is located at approximately 9.7km distance from the Proposed Development and would be outwith the ZTV, indicating No View.</p> <p>There would be no visibility from within the main part of the estate including the main house, the Observatory and Ness Glen. Other potential views would be heavily screened by mature broadleaf trees and woodland within the estate. Views of the Proposed Development would be visible from the east facing slopes and summits of hills rising to the western edge of the estate (the ZTV indicates theoretical visibility of 13 to 16 turbines) at Auchenroy Hill and Little Shalloch.</p> <p>FEI Viewpoint 11: Auchenroy Hill illustrates the view from the hill summit which is assessed in further detail in FEI Appendix 9.B. The Proposed Development would be visible to the east at 10.9km distance beyond forestry affecting approximately 11° of the FoV. The magnitude of change is assessed as Low and the level of effect as Moderate and not significant.</p> <p>The overall magnitude of change would range from Low to Zero and the level of effect would be Moderate to No view and not significant. The nature of these effects would be long-term (reversible), cumulative, indirect and neutral to negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>No existing or consented wind farms would be simultaneously visible. There would however be successive visibility of the consented Dersalloch Wind Farm to the west from some parts of the estate (High magnitude of change) at a distance of approximately 1.4km in the opposite direction (Figures 9.52a/b/c/d/e illustrate the 360° view from the summit of Auchenroy Hill).</p> <p>The additional effects of the Proposed Development would range from Moderate to No View and not significant. The combined cumulative effect would increase to Substantial to No View and significant (due to Dersalloch). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p>There would be simultaneous views of the South Kyle application to the east at approximately 8.5km distance (Low magnitude) and other applications theoretically visible beyond including Benbrack, Garleffan, Lethans, Pencloe, Lorg and Windy Rig (Low to Negligible magnitude). There would also be successive views of Keirs Hill application from Auchenroy Hill to the northwest (Medium magnitude).</p> <p>The additional effects of the Proposed Development would range from Moderate to No View and not significant. The combined cumulative effect would increase to Substantial to No View and significant (due to Dersalloch and Keirs Hill). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Cairnsmore of Carsphairn (Corbett)</p>	<p>The Cairnsmore of Carsphairn is a hill summit located to the southeast of Dalmellington. FEI Viewpoint 8: Cairnsmore of Carsphairn illustrates the views from this summit (Figure 9.34a/b/c/d) and this is further supported by the 360° view illustrated in Figure 9.51a/b/c/d/e. The Proposed Development would appear against the landscape at a distance of approximately 8.7km to the north. All of the proposed 16 turbines would be visible, appearing as a simple and cohesive design with minimal overlapping. The magnitude of change would be Low and the level of effect would be Moderate and not significant. The nature of these effects would be long-term (reversible), indirect, cumulative and neutral to negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>There would be simultaneous views of multiple wind farm developments as reported in FEI Appendix 9.B. The overall magnitude of change would be Medium. The main contributing wind farms are Windy Standard Extension (Medium magnitude) at a distance of approximately 2.5km and Afton (Medium to Low magnitude) at a distance of approximately 5km.</p>

Recreational and Tourist Destinations	Description of Effect
	<p>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would increase to Substantial / Moderate and significant (due to Windy Standard Extension and Afton). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p>There would be further simultaneous views of multiple wind farm developments as reported in FEI Appendix 9.B. The overall magnitude of change would be Medium. The main contributing wind farm applications are South Kyle (Medium magnitude) at a distance of approximately 4.5km, Windy Rig at 2km to the northeast (Medium magnitude), Benbrack at 6km to the northwest (Medium to Low magnitude) and Pencloe at 7km to the northeast (Low magnitude).</p> <p>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would increase to Substantial / Moderate and significant (due to Windy Rig and South Kyle). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Blackcraig Hill 700m AOD (Graham)</p>	<p>Blackcraig Hill (700m) is located to the south of New Cumnock and to the northeast of the Proposed Development within the Southern Uplands. FEI Viewpoint 6: Blackcraig Hill illustrates the views from this summit (Figure 9.32a/b/c/d) and this is further supported by the 360° view illustrated in Figure 9.53a/b/c/d/e. The Proposed Development would appear partially across the horizon and against the landscape at a distance of 7.2km to the west. All of the proposed 16 turbines would be visible appearing as a simple and cohesive design with minimal overlapping. The magnitude of change would be Medium and the level of effect would be Substantial / Moderate and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>There would be simultaneous views of multiple wind farm developments as reported in FEI Appendix 9.B. The overall magnitude of change would be High. The main contributing wind farms are Hare Hill and Extension at approximately 3km distance to the north (Medium magnitude) Windy Standard Extension (Medium magnitude) at approximately 6km distance to the west and Afton (High magnitude) at approximately 2.5km distance and also to the west.</p> <p>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would be Substantial and significant (due to Windy Standard Extension and Afton). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p>There would be further simultaneous views of multiple wind farm developments as reported in FEI Appendix 9.B. The overall magnitude of change would be High. The main contributing wind farm applications are South Kyle (Medium magnitude) at approximately 7km distance to the southwest and Pencloe at 7km distance to the west (Medium magnitude).</p> <p>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would be Substantial and significant (due to Windy Standard Extension, Afton, South Kyle and Pencloe as well as the Proposed Development). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</p>
<p>Windy Standard 698m AOD (Graham)</p>	<p>Windy Standard is a hill summit in the Southern Uplands located to the southeast of the Afton Reservoir and approximately 7km southeast of the Proposed Development. The turbines of the existing Windy Standard Wind Farm cover the hill summit and much of its slopes to the north-west. The Proposed Development would appear beyond the existing turbines in the foreground, partially across the horizon and against the landscape at a distance of 7km. All of the 16 proposed turbines would be visible and would appear as a simple and cohesive design with minimal overlapping. The magnitude of change would be Medium and the level of effect would be Substantial / Moderate and significant. The nature of these effects would be long-term (reversible), indirect, cumulative and neutral to negative.</p> <p><u>Cumulative Assessment: Existing + Consented Sites</u></p> <p>There would be simultaneous views of multiple wind farms and the main ones are noted as follows:</p> <p>The existing Windy Standard Wind Farm and the consented Windy Standard Extension site to the northwest and west (both High magnitude). There would also be simultaneous views with the consented Afton Wind Farm to the north (<i>High to Medium</i> magnitude) at a distance of approximately 1.1km to the northeast. There would be successive views with existing Hare Hill and the consented Hare Hill Extension schemes to the northeast (<i>Low</i> magnitude) at a distance of approximately 8.3km and 7.3km respectively. There would also be successive views with the consented Sanquhar, <i>Sanquhar 'Six'</i>, Whiteside Hill and Twentysilling Hill schemes to the east, although their contribution would not be significant. The combined magnitude of these wind farms</p>

Recreational and Tourist Destinations	Description of Effect
	<p>is assessed as <i>High</i> and the combined level of effect would be Substantial and significant due to the Windy Standard group.</p> <p><i>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would be Substantial and significant (due to the Windy Standard group). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p> <p><u>Cumulative Assessment: Existing + Consented Sites + Applications</u></p> <p>There would be simultaneous views of multiple wind farm applications and the main ones are noted as follows:</p> <p>There would also be simultaneous views with the South Kyle application site (<i>High to Medium</i> magnitude), the Pencloe application site (<i>Medium</i> magnitude). The combined magnitude of these wind farms is assessed as <i>High to Medium</i>. The combined level of effect would be Substantial and significant.</p> <p><i>The additional effects of the Proposed Development would be Moderate and not significant. The combined cumulative effect would be Substantial and significant (due to the Windy Standard group and the South Kyle group). The nature of these effects would be long-term (reversible), indirect, cumulative and negative.</i></p>

9.9 Summary of Residual Landscape and Visual Effects

- 9.9.1 A summary of the landscape and visual effects for each receptor is provided in **Tables 9.16 and 9.17**.
- 9.9.2 The information set out in the summary tables lists the main receptors included in this assessment and provides a summary of the landscape and visual effects of the Proposed Development and the cumulative effects as follows:
- ▶ LVIA Assessment:
 - ▶ Receptor Name;
 - ▶ Sensitivity: The sensitivity of the receptor is recorded (ranging from high, medium, low, and negligible) in accordance with the methodology in ES **Appendix 9.A**;
 - ▶ Primary Magnitude: The magnitude of change, taking account of the Proposed Development only, is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology; and
 - ▶ Primary Level of Effect: The level of effect for the Proposed Development only is recorded and takes account of the sensitivity and magnitude in accordance with the methodology.
 - ▶ Assessment: CLVIA:
 - ▶ Magnitude (Existing and Consented wind farms): The magnitude of change, taking account of other existing and consented / under construction wind farms that may have a cumulative effect is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology;
 - ▶ Cumulative Level of Effect 1: The level of effect, taking account of the other existing, consented / under construction wind farms and the Proposed Development, is recorded (taking account of the sensitivity and magnitude in accordance with the methodology). Those levels of effect shown in bold relate to significant effects in accordance with the relevant EIA Regulations and the wind farm contributing most to the cumulative effects is recorded in brackets;
 - ▶ Magnitude (Other Application Wind farms): The magnitude of change, taking account of other wind applications that may have a cumulative effect is recorded (ranging from high, medium, low, negligible, and zero) in accordance with the methodology;

- ▶ Cumulative Level of Effect 2: The level of effect, taking account of the other existing, consented / under construction, application wind farms and the Proposed Development, is recorded (taking account of the sensitivity and magnitude in accordance with the methodology). Those levels of effect shown in bold relate to significant effects in accordance with the relevant EIA Regulations and the wind farm contributing most to the cumulative effects is recorded in brackets.
- ▶ Additional Level of Effect: The additional level of effect resulting from the addition of the Proposed Development to the baseline of other existing, consented and application wind energy developments.

Table 9.16 Summary and Evaluation of the Predicted Landscape Effects

Receptor	Sensitivity	LVIA Assessment: Proposed Development (Primary Effects)		Cumulative Assessment: (Proposed Development and other wind farms)				
		Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented <u>only</u>)	Cumulative Level of Effect 1 (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications <u>only</u>)	Cumulative Level of Effect 2 (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
Landscape Effects on the 'Host' Landscape: Southern Uplands and Forestry: Enoch Hill LCA								
Construction Effects: Southern Uplands and Forestry: Enoch Hill LCA	Medium	Zero to High	None, increasing to Substantial / Moderate	Not assessed				
Operational Effects: Southern Uplands and Forestry: Enoch Hill LCA	Medium	High	Substantial / Moderate	Low	Substantial / Moderate	High	Substantial / Moderate (Kyle, Pencloe and the Proposed Development)	Substantial / Moderate
Decommissioning Effects: Southern Uplands and Forestry: Enoch Hill LCA	Medium	Negligible	Slight / Negligible	Not assessed				
Landscape Effects: East Ayrshire Southern Uplands: Benty Cowan Hill LCA								
Construction Effects: Southern Uplands: Benty Cowan Hill LCA	High / Medium	Zero to High	None, increasing to Substantial / Moderate	Not assessed				
Operational Effects: Southern Uplands: Benty Cowan Hill LCA	High / Medium	High	Substantial / Moderate	Low	Substantial / Moderate	Zero	Not assessed	Substantial / Moderate
Decommissioning Effects: Southern Uplands: Benty Cowan Hill LCA	High / Medium	Negligible	Slight / Negligible	Not assessed				

Receptor	Sensitivity	LVIA Assessment: Proposed Development (Primary Effects)	Cumulative Assessment: (Proposed Development and other wind farms)					
		Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented <u>only</u>)	Cumulative Level of Effect 1 (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications <u>only</u>)	Cumulative Level of Effect 2 (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
Indirect Landscape Effects on the Upland Basin and the Afton SLAC								
Upland Basin: New Cumnock (15)	Medium	Medium	Moderate	Low	Moderate	Medium	Substantial / Moderate (Multiple development and the Proposed Development)	Moderate
Afton SLCA	High	Low	Moderate	Medium	Substantial / Moderate (Afton)	Medium	Substantial / Moderate (Afton and Pencloe)	Moderate

Table 9.17 Summary and Evaluation of the Predicted Visual Effects

Receptor	Sensitivity	LVIA Assessment: the Proposed Development (Primary Effects)		Cumulative Assessment: (Proposed Development and other wind farms)				
		Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented only)	Cumulative Level of Effect 1 (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications only)	Cumulative Level of Effect 2 (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
Visual Effects on Views from Settlements within 10km								
Burnside	High	High to Medium	Substantial to Substantial / Moderate	Negligible	Substantial to Substantial / Moderate	Low	Substantial to Substantial / Moderate	Substantial to Substantial / Moderate
Bankglen	High	Low	Moderate	Low	Moderate to No View	Low	Moderate to No View	Moderate to No View
Connel Park	High	Low	Moderate	Low	Moderate to No View	Low	Moderate to No View	Moderate to No View
Leggate	High	Low	Moderate	Low	Moderate to No View	Low	Moderate to No View	Moderate to No View
New Cumnock	High	Medium to Zero	Substantial / Moderate to No View (Connel View and Cemetery)	Low to Negligible	Substantial / Moderate to No View (Connel View and Cemetery)	Medium to Zero	Substantial / Moderate to No View	Substantial / Moderate to No View (Connel View and Cemetery)
Dalmellington	High	Zero	No View	No cumulative effects.				
Burnton	High	Negligible to Zero	Slight to No View	Low to Zero	Moderate to No View	Medium to Zero	Substantial / Moderate to No View	Slight to No View
Cumnock	High	Negligible to Zero	Slight to No View	Negligible to Zero	Slight to No View	Negligible to Zero	Slight to No View	Slight to No View
Visual Effects on Views from Transport Routes within 10km								
A76 between Cumnock and Burnton east of New Cumnock / Burns Heritage Trail	Medium	Medium to Zero	Moderate to No View	Medium to Low	Moderate to No View	High to Medium	Substantial / Moderate to No View (multiple wind farms including the Proposed Development and Garleffan)	Moderate to No View

Receptor	Sensitivity	LVIA Assessment: the Proposed Development (Primary Effects)		Cumulative Assessment: (Proposed Development and other wind farms)				
		Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented only)	Cumulative Level of Effect 1 (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications only)	Cumulative Level of Effect 2 (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
A713 Galloway Tourist Route between Waterside and Dalmellington	High	Low to Zero	Moderate to No View	Negligible	Moderate to No View	High	Substantial to No View (Keirs Hill)	Moderate to No View
B741 between Auchinroy and New Cumnock	Medium	High to Zero	Substantial / Moderate to No View	Low	Substantial / Moderate to No View	High to Zero	Substantial / Moderate to No View (multiple wind farms including the Proposed Development, South Kyle and Pencloe)	Substantial / Moderate to No View
Glasgow to Carlisle railway line between south of Auchinleck and west of New Cumnock	Medium	Medium to Zero	Moderate to No View	Medium to Zero	Moderate to No View	High to Zero	Substantial / Moderate to No View (multiple wind farms including the Proposed Development and Garleffan)	Moderate to No View
Visual Effects on Views from Recreational Routes: Core Paths and Rights of Way within 5km								
DGC Core Path No. 667 Water of Deugh Trail	High	Negligible to Zero	Slight to No View	Low to Zero	Moderate to No View	High	Substantial to No View (South Kyle)	Slight to No View
EAC Core Path No. C12: New Cumnock Circular	High	Medium to Zero	Substantial / Moderate to No View	Low	Substantial / Moderate to No View	Medium to Low	Substantial / Moderate to No View	Substantial / Moderate to No View
Visual Effects on Views from Recreational Routes: Scottish Hill Tracks and Heritage Paths within 10km								
Heritage Path and Scottish Hill Track 84: Afton Road (also part Core Path C10: Coalfield Cycle Route)	High	Medium to Zero	Substantial / Moderate to No View	Medium to Zero	Substantial / Moderate to No View	Medium to Zero	Substantial / Moderate to No View	Substantial / Moderate to No View
Scottish Hill Tracks - 81: Barr to Dalmellington and 78b: Glen Trool Village to Dalmellington by Tunskeen	High	Low to Negligible	Moderate to Slight	Negligible to Zero	Moderate to Slight	Negligible to Zero	Moderate to Slight	Moderate to Slight

Receptor	Sensitivity	LVIA Assessment: the Proposed Development (Primary Effects)		Cumulative Assessment: (Proposed Development and other wind farms)				
		Primary Magnitude	Primary Level of Effect (Standalone)	Magnitude (Existing and Consented <u>only</u>)	Cumulative Level of Effect 1 (Combined effect of existing, consented and the Proposed Development)	Magnitude (Applications <u>only</u>)	Cumulative Level of Effect 2 (Combined effect of all wind farms and the Proposed Development)	Additional Level of Effect (Additional Effect of the Proposed Development to the existing + consented + application wind farms)
Visual Effects on Views from Recreational and Tourist Destinations within 10km								
Knockshinnoch Lagoons	High	Medium to Zero	Substantial / Moderate to No View	Low	Substantial / Moderate to No View	Medium to Zero	Substantial / Moderate to No View	Substantial / Moderate to No View
Craigengillan GDL	High	Low to Zero	Moderate to No View	High	Substantial to No View (Dersalloch)	Medium	Substantial to No View (Dersalloch and Keirs Hill)	Moderate to No View
Cairnsmore of Carsphairn	High	Low	Moderate	Medium	Substantial / Moderate (Windy Standard Extension and Afton)	Medium	Substantial / Moderate (Windy Standard Extension, Afton, Windy Rig and South Kyle)	Moderate
Blackcraig Hill	High	Medium	Substantial / Moderate	High	Substantial (Hare Hill / Windy Standard Extensions and Afton)	Medium	Substantial (Hare Hill / Windy Standard Extensions and Afton+ South Kyle)	Moderate
Windy Standard	High	Medium	Substantial / Moderate	High	Substantial (Windy Standard Group)	High to Medium	Substantial (Windy Standard and South Kyle Groups)	Moderate

9.10 Summary and Conclusions

- 9.10.1 The Proposed Development has been revised in response to consultation comments received from EAC and SNH to further improve the design and visual composition, as it would be seen from the surrounding landscape and in particular, locations in and around New Cumnock and the Upland Basin of the River Nith. In comparison with the Original Layout, the Revised Layout has a reduction in the land take from ~14.23ha to ~13.06ha and a reduction in the maximum number of turbines from up to 19 to up to 16.

Consultation and Scope of Assessment

- 9.10.2 The revised assessment conforms to the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA) and has been undertaken by chartered landscape architects at Amec Foster Wheeler Environment and Infrastructure Ltd.
- 9.10.3 The scope and geographical extent of the FEI assessment has been limited to landscape receptors within 5km and visual receptors within 10km of the Proposed Development as a result of the consultation advice. Landscape and visual receptors previously assessed as less than moderately affected in the ES, and not subject to further consultation have been noted, but excluded from further revised assessment within the FEI.

East Ayrshire Council

- 9.10.4 As part of the consultation process undertaken by LECU, Ironside Farrar Ltd were commissioned by EAC to undertake a review of the LVIA set out in the ES (**Chapter 9**). The subsequent report "*Enoch Hill Wind Farm, Audit of Landscape and Visual Impact Assessment*" Ironside Farrar Ltd, January 2016 noted, on page 17 that "*the LVIA is a comprehensive appraisal*".
- 9.10.5 The audit agreed with the proposed design objectives set out in the ES and subsequent advice from consultation has led to changes to the re-design and layout of the Proposed Development which also reflects the design objectives. Further viewpoint analysis and site survey has been conducted and there has been alteration to the presentation of cumulative effects, ensuring that the distinction between primary (standalone, additional and combined cumulative effects of the Proposed Development is made clearer). The assessment has focused further on landscape character effects on the Southern Uplands and Southern Uplands with Forestry and the Upland Basin; and on the visual effects on views from Cumnock and New Cumnock.

Scottish Natural Heritage

- 9.10.6 SNH advised that the "*Enoch Hill Wind Farm would be likely to result in significant cumulative and landscape impacts*", a conclusion which accords with the stated results of the LVIA as reported in the ES. SNH have not objected to the Proposed Development.
- 9.10.7 In particular, SNH commented on the design and cumulative landscape effects on the Southern Uplands / Southern Uplands with Forestry and views from the Upland Basin as well as a potential in their view for the scheme to further 'encircle' the settlements of New Cumnock and Dalmellington. It should in fact be noted that there would be no view of the Proposed Development from Dalmellington.

Landscape Planning Policy and Guidance

- 9.10.8 The LVIA process has taken into account relevant national and local planning policy requirements, as outlined in **Chapter 5 – Planning Policy Context** and **Chapter 9** of the ES. The revised assessment has also noted the non-statutory guidance emerging through the following draft consultation documents relating to wind energy development in Dumfries and Galloway.

- ▶ *The DGC Local Development Plan Supplementary Guidance – Part 1 Wind Energy Development: Development Management Considerations. Consultation Draft (September 2016); and*
- ▶ *Dumfries and Galloway Wind Farm Landscape Capacity Study. Revised and updated study report – EEI Committee (2016).*

Cumulative Wind Energy Development

- 9.10.9 Other wind energy development included in the revised cumulative landscape and visual impact assessment, has been updated from the ES and includes those wind energy developments within the 35km radius Study Area as listed in FEI **Appendix 9.E** and illustrated in FEI **Figures 9.6** and **9.7**, Volume 2.

Viewpoint and Cumulative Viewpoint Analysis

- 9.10.10 The viewpoint analysis has been conducted from same 22 locations used for the ES and 2 additional viewpoints, including one from Drumbrochan Road, Cumnock and one from the edge of the Upland Basin / Upper Nith Valley.
- 9.10.11 The viewpoint analysis indicates that the primary significant visual effects would extend out in a north and northeast direction, primarily affecting views from the Upland Basin, including open views from the A76 and the south western edge of New Cumnock within approximately 7km from the nearest turbine locations, as indicated by Viewpoints 1, 2, 4, 5, 6 and 7.
- 9.10.12 The partial ‘containment’ of the Development Site area by landform and forestry to the west, south and east has contributed to the limited ZTV coverage of those areas to the west, south and east

Landscape Design Statement and Mitigation

- 9.10.13 A revised and illustrated Landscape Design Statement is set out in FEI **Appendix 9.A**.
- 9.10.14 The Landscape Design Statement has drawn from the advice of SNH and EAC during the application process and other technical non-statutory guidance including the EALCS. The design concept has taken account of the SNH ‘*Guidance on Siting and Designing Windfarms*’ aiming to achieve a simple, rational, and cohesive design that limits overlapping turbines and gaps within the visual composition.
- 9.10.15 The inherent nature of wind turbines as tall, modern structures means that the form of the wind farm as a whole is important, and a clear design strategy is necessary. The strategy therefore considered the appearance of the wind farm as an object or composition in the landscape as a factor in generating the layout.

Landscape Design Objectives

- 9.10.16 The design objectives which were developed for the original design, and set out in the ES were considered by Ironside Farrar as part of their audit of the LVIA on behalf of EAC. They considered that the principles and objectives of the Design Statement generally reflected “*the sensitivities, opportunities and constraints identified in the EALCS*”. For these reasons the design objectives have been retained and the revised design also meets these objectives which are repeated from ES **Chapter 9** as follows:
- ▶ *“Achieve a simple, rational, and cohesive design from most viewpoints avoiding turbine stacking, gaps and outlying turbines so the scheme can be accommodated on a stand-alone basis or cumulatively;*
 - ▶ *Turbine development should avoid the ‘front’ north facing hill slopes overlooking settlements, roads and residential receptors within the Upland Basin. The hill tops and visually less sensitive interior hills would be preferable in order to maintain a sense of separation between the lower*

lying areas and the more elevated Southern Uplands / Southern Uplands with Forestry which are most capable of accommodating wind farm development;

- ▶ *Ensures that the scale of the Proposed Development is proportionate to the expansive scale of the underlying Southern Uplands with Forestry landscape and in terms of the perceived scale of development when viewed from residential properties, settlements, roads and footpaths within the New Cumnock Upland Basin LCA to the north;*
- ▶ *Achieve a design proposal that would be broadly compatible or co-existent with other existing and consented wind farm development within the LVIA Study Area. In this respect the design should adopt a clustered layout that is broadly similar to neighbouring wind farm developments in terms of perceived turbine height, number, proportion, three bladed turbine design, colour and lighting;*
- ▶ *The Proposed Development has a maximum turbine height of up to 130m, which compares reasonably well with the maximum turbine height consented at nearby schemes such as Sanquhar (130m), Dersalloch (125m) and Afton (120m & 100m);*
- ▶ *Maintain the simple landscape character of the Development Site by siting ground based infrastructure in the least visible locations when viewed from receptor locations to the north and north east including New Cumnock, the B741 and the A76;*
- ▶ *Limit landscape and visual effects on the visual receptors including local residents, roads, recreational routes and visitor / tourist destinations including Glen Afton.”*

9.10.17 In response to the comments on design from the EAC audit and SNH, the revised design has sought to achieve the following:

- ▶ Continue with a clustered layout avoiding north facing slopes and hill shoulders as far as possible;
- ▶ Produce a simpler and more compact layout with reduced horizontal spread; and
- ▶ Remove outlying turbine 16.

Landscape Design Considerations of the Proposed Development

- 9.10.18 Both the EALCS in East Ayrshire and the DGLCS2 in Dumfries and Galloway provide sensitivity analysis of the Southern Uplands and Southern Uplands with Forestry LCTs, which may be considered relevant to the Development Site and collectively they record a 'high to medium' and 'medium' inherent landscape sensitivity to large scale turbine development, concluding that the perceived landscape capacity for large scale turbines ranges from 'no scope' to 'very limited' within East Ayrshire, with further capacity identified in Dumfries and Galloway.
- 9.10.19 It may be noted that within East Ayrshire, none of the LCTs are assessed as below Medium sensitivity to large scale wind farm development and only one LCT (Foothills with Forest and Opencast Mining: 17a) is assessed as of Medium sensitivity to large scale wind farm development. In total, six of the twelve LCTs are assessed as being of High sensitivity and five of the twelve LCTs are assessed as being of High-Medium sensitivity to large scale wind farm development within the EALCS.
- 9.10.20 Both documents however refer to the large or *expansive* scale and simplicity of the landscape character as an opportunity for large scale wind farm development, noting that the general lack of settlement and presence of nearby forestry are factors that indicate some capacity for large scale wind turbines.
- 9.10.21 Particular references to Glen Afton and Loch Doon / Doon Water and Dalmellington as potential constraints are not relevant to the Proposed Development, due to the limited potential visibility from within these areas. Concerns about visual effects on the views towards the landmark hill summit of Blackcraig Hill and cumulative development close to Hare Hill Wind Farm are also not relevant in this case as indicated by the viewpoint analysis and visualisations which demonstrate that views of

the Proposed Development would not interfere with views towards Blackcraig Hill or Craigbraneoch Rig on the eastern edge of Glen Afton.

- 9.10.22 A general reference to the potential visibility of wind farm development from the Upland Basin as a constraint is however a relevant consideration for this Proposed Development and one of the reasons for establishing a northern limit or 'turbine exclusion' zone across the north facing hill slopes of the Development Site. The establishment of a northern limit or 'turbine exclusion' zone across the north facing hill slopes of the Development Site was also developed in response to feedback obtained as a result of public consultation and Community Liaison Group meetings. This turbine 'exclusion area' ensures that turbines would not be positioned on the 'front' north facing hill slopes. This constraint also had the benefit of minimising potential visual effects on the views from the closest receptors, including residential properties located to the north of the Development Site and more general views from New Cumnock and the Upland Basin area to the north and north east.

Cumulative Landscape Design Considerations of the Proposed Development

- 9.10.23 It is of primary importance that the Proposed Development can be accommodated alongside other existing and consented development, but consideration has also been given to other wind farm applications such as South Kyle and Pencloe in the event that either one or both of these are also consented. The design of the Proposed Development has taken account of these possible cumulative scenarios as part of the turbine composition from a number of the assessment viewpoints, ensuring as far as possible visual compatibility in terms of turbine layout and scale.

Mitigation Inherent in Proposed Development

- 9.10.24 Particular design mitigation measures include the location of site infrastructure: anemometer masts, the SPEN substation compound, temporary construction compounds, borrow pit search areas and Development Site access / on-site access tracks have all been located to areas of the Development Site where there would be limited visibility from the main receptors to the north and northeast in the Upland Basin. In particular the SPEN compound, borrow pit search areas and access tracks have been located as far as possible to the lee of hills or southern and southwest positions and summits to reduce visibility. The success of this design approach can be seen in the visualisations prepared for those viewpoints within 5km where the proposed infrastructure has been rendered onto the photomontages where visible (Viewpoints 1, 2, 3, 4 and 5). As can be seen from these viewpoints, there would be limited visibility of the associated infrastructure from these locations.
- 9.10.25 One PRoW exists partly within the site boundary as shown on FEI **Figure 9.21**, which is routed from the B741, near Dalleagles School House, south along Dalleagles Burn to the head of that watercourse between Chang Hill and Benty Cowan Hill.

Landscape Effects

- 9.10.26 The area of the Development Site is partly within the Southern Uplands and Forestry: Enoch Hill LCA and partly within the Southern Uplands: Benty Cowan Hill LCA as classified by the EALCS. All of the proposed turbines would be located within 1km of forestry and at least 11 turbines within 500m of forestry and detailed site analysis indicates that the site area is strongly influenced by the Southern Uplands and Forestry: Enoch Hill LCA and is partly transitional between the two landscape character types.
- 9.10.27 The Proposed Development would lead to a significant effect on part of the Southern Uplands and Forestry: Enoch Hill LCA and / or part of the East Ayrshire Southern Uplands: Benty Cowan Hill LCA, with the significant landscape effects extending out to approximately 2-2.5km from the proposed turbine locations.
- 9.10.28 The Proposed Development would also lead to a significant, indirect effect on the southern views and the backdrop of the Southern Uplands as viewed from the New Cumnock Upland Basin LCA, to the west and northwest of New Cumnock. Much of this area and the associated southern views

are already partly characterised by views of wind farm development at Hare Hill and Windy Standard wind farms and would not appear incongruous. The assessment also notes that part of this area is currently characterised by open cast mining operations, reducing its overall sensitivity to wind farm development. The nature of these effects is further detailed as part of the visual assessment.

- 9.10.29 The Development Site is designated at a local level as part of the Afton Sensitive Landscape Character Area (SLCA). Although there would be a significant effect on landscape character within part of the Afton SLCA, it is not considered that the special qualities of the SLCA, its integrity or the reasons for its designation would be significantly affected, and there would be little or no visibility from within the Afton Glen area itself, which forms the focus of the SLCA in this area.

Visual Effects

- 9.10.30 The Proposed Development would have a significant effect on views from the small settlement at Burnside and from the south western edge of New Cumnock, along Connel View and at the Cemetery along Afton Road (also promoted as a Scottish Hill Track / Heritage Path). There would also be a significant effect on views from part of the B741 and two core paths and two Rights of Way, views from part of Knockshinnock Local Nature Reserve and the hill summits of Blackcraig Hill and Windy Standard.
- 9.10.31 Further wireframe analysis and site survey has confirmed that there would be No View from the settlement of Dalmellington or the main house at Craigengillan GDL or the Dark Sky Observatory.
- 9.10.32 There would be no significant visual effects on the views from Cumnock which was included in the assessment as a result of the consultation response from EAC (FEI **Figure 9.49a**).

Residential Visual Amenity Assessment

- 9.10.33 A Residential Visual Amenity Assessment is detailed in FEI **Appendix 9.C**. In summary it may be noted that none of the 24 residential properties included in the assessment (including the group of 8 properties in Dalleagles Terrace) would experience a significant visual effect as a result of the Proposed Development from the ground floor main living areas or main garden areas. It is however noted that significant visual effects may be possible from upper floors or the wider property curtilage, which is not included in this assessment.
- 9.10.34 No residential properties would be affected in terms of their residential visual amenity.

Response to Consultation

- 9.10.35 Drawing from the revised assessment, a further response to remaining matters raised by SNH are considered further as follows:

Intensification of Cumulative Wind Energy Development:

- 9.10.36 There would be an 'intensification' of wind energy development in the wider Southern Uplands and Southern Uplands with Forestry LTCs within 10km. The Proposed Development in combination with two applications (South Kyle and Benbrack) would represent a third group of wind farm development in addition to the Hare Hill and Windy Standard groups. The geographical spread of this development, in particular resulting from the South Kyle application would lead to the characterisation of much of this part of the Carsphairn Forest as a 'wind farm with forestry' landscape character type.

Enclosing and Encircling Effects on the Upland Basin

- 9.10.37 The spread of other cumulative wind farm development within these areas of landscape character which surround the Upland Basin is illustrated in FEI **Figure 9.17**. The Hare Hill Group, Windy Standard Group (including Pencloe) and the South Kyle Group of applications (South Kyle, Benbrack and the Proposed Development) collectively form a mass of wind farm development that

would be limited to the southern quadrant and could not physically enclose or encircle the Upland Basin alone.

- 9.10.38 The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to enclosure or encirclement of the Upland Basin, wind farm development would be visible in more than one direction from within the Upland Basin. The wider, more extensive views in other directions to the north, east and west would remain wind farm free.
- 9.10.39 Other wind farm applications such as Lethans and Polquhairn would have limited or no visibility from within the Upland Basin and would not further add to enclosure or encirclement.

Encircling of Settlements at Dalmellington and New Cumnock

- 9.10.40 *The SNH consultation response expressed concerns about the potential for cumulative wind energy development to encircle New Cumnock.* The spread of other cumulative wind farm development, including the Hare Hill Group, Windy Standard Group (including Pencloe) and the South Kyle Group of applications (South Kyle, Benbrack and the Proposed Development) would be limited to the southern quadrant and could not physically enclose or encircle the settlement of New Cumnock. The Garleffan application is located within the East Ayrshire Plateau Moorland (18a) to the northeast in the opposite direction. Rather than leading to the enclosure or encirclement of the settlement of New Cumnock, wind farm development would be visible in mainly two, opposing directions from within the Upland Basin. Wider, more extensive views in other directions to the north, east and west would remain wind farm free.
- 9.10.41 The SNH consultation response expressed concerns about *“the potential for cumulative wind energy development to encircle Dalmellington”*. In practice there would be No View from the settlement and limited visibility of the Proposed Development from the A713 approach road along the River Doon, Upland River Valley. As such, the contribution of the Proposed Development to any perceived encirclement of Dalmellington would be limited and not significant.

Conclusions

- 9.10.42 The Proposed Development has taken account of the non-statutory guidance within the EALCS and the DGLCS and through the preliminary design and assessment process has located the turbines into the southern, least sensitive part of the Development Site in order to mitigate potential effects on views from the New Cumnock Upland Basin area. In doing so, the Proposed Development seeks to exploit landscape characteristics identified within this area as suitable for large scale wind farm development in the EALCS, whilst avoiding those areas which may be considered as of higher sensitivity.
- 9.10.43 Drawing from the advice of the consultation, the design of the Proposed Development has been revised to ensure that it more closely accords with the design objectives. As a result, there has been an improvement to the visual composition of the Proposed Development as viewed from the surrounding areas and in particular from the north and north east within the Upland Basin and around New Cumnock. The revised design has resulted in a tighter and more cohesive and even wind farm group, reducing the horizontal spread of the Proposed Development, the incidence of turbine gaps, overlaps and outliers. Turbine 16 was identified as an outlying turbine through the consultation process and this has been removed.
- 9.10.44 The proposed turbines are located remote from residential properties to the north, within a less sensitive part of the Development Site, providing a generous ‘set-back’ from the adjacent B741 minor road and thus increasing the level of mitigation afforded to landscape and visual receptors in the New Cumnock Upland Basin to the north along the B741 and around the New Cumnock area. In addition, the turbine composition has been visually composed to improve its appearance from the main viewpoints to the north and from within the New Cumnock Upland Basin LCA. In doing so, the Proposed Development has achieved its landscape design objectives in terms of integrating the Proposed Development within its proposed landscape setting and cumulative baseline whilst limiting and mitigating potential landscape and visual effects.

9.10.45

In this respect, it is notable that the likely significant effects of the Proposed Development would be limited to part of the Southern Uplands / Southern Uplands with Forestry LCT, a typology that is generally considered as more able to accommodate wind energy development when compared to other LCTs. Further, the significant visual effects would be largely contained to the New Cumnock, Upland Basin LCA to the west and north of New Cumnock. There would be no significant effects on the views from the closest residential properties within 3km. There would be significant visual effects on the south western views from Burnside, Knockshinnoch Lagoons Local Nature Reserve, the south western edge of New Cumnock and part of the B741 and 2 local footpaths / rights of way. However, all of these receptors are set within the Upland Basin and tend to have a northern or north westerly aspect, viewing across the River Nith to the north and away from the Proposed Development. There would also be significant visual effects on views from the hill summits of Blackcraig Hill and Windy Standard Hill, experienced in the context of other existing and consented wind farm development located in the intervening fore or middle ground.

9.11 References

- ▶ Anderson, Carol; East Ayrshire Landscape Wind Capacity Study (EALCS) (2013);
- ▶ Anderson, Carol in association with Alison Grant, Landscape Architects; Dumfries and Galloway Wind Farm Landscape Capacity Study, Final Main Report (DGLCS) (2013);
- ▶ Anderson, Carol, Landscape Associates; Dumfries and Galloway Wind Farm Landscape Capacity Study, Revised and updated study report – EEI Committee (DGLCS 2) (August 2016);
- ▶ Anderson, Carol Landscape Associates; South Ayrshire Wind Farm Landscape Capacity Study, Main Study Report (2013);
- ▶ East Ayrshire Council; East Ayrshire Local Plan (2010);
- ▶ East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016;
- ▶ East Ayrshire LDP Proposed Plan (2015);
- ▶ Ironside Farrar; South Lanarkshire Spatial Framework and Landscape Capacity for Wind Turbines Update (2013);
- ▶ Landscape Institute and IEMA, Guidelines for Landscape and Visual Impact Assessment, Third Edition, (2013);
- ▶ Land Use Consultants on behalf of Scottish Natural Heritage; Dumfries and Galloway Landscape Assessment, SNH Review No 94 (1998);
- ▶ Land Use Consultants on behalf of Scottish Natural Heritage; Ayrshire Landscape Assessment, SNH Review No 111 (1998);
- ▶ Scottish Government, National Planning Framework 3, (2019);
- ▶ Scottish Government, Scottish Planning Policy (2019);
- ▶ Scottish Government, Online Renewables Planning Advice Sheet - Onshore Wind Turbines (updated 28th May 2014);
- ▶ Scottish Natural Heritage, Guidance: Assessing the Cumulative Impacts of Onshore Wind Energy (March 2012);
- ▶ Scottish Natural Heritage, Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage: Policy Statement 02/02 (March 2009);
- ▶ Scottish Natural Heritage, Guidelines on the Environmental Impacts of Wind Farms and Small Scale Hydroelectric Schemes (2001);

- ▶ Scottish Natural Heritage, Siting and Designing Wind Farms in the Landscape, Version 1 (December 2009);
- ▶ Scottish Natural Heritage, Siting and Designing Wind Farms in the Landscape, Version 2 (May 2014);
- ▶ Scottish Natural Heritage, Visual Representation of Wind Farms (2014);
- ▶ Scottish Natural Heritage, The Special Qualities of the National Scenic Areas, Commissioned Report No.374 (2010);
- ▶ SNH Policy Statement No. 02/02: Guidance on Onshore Renewable Energy (2009);
- ▶ Scottish Natural Heritage & Countryside Agency, Landscape Character Assessment, Guidance for England and Scotland, Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity (2004);
- ▶ Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, and the Forestry Commission Scotland joint publication, Good Practice during Windfarm Construction: Version 1 (October 2010);
- ▶ University of Newcastle and Scottish Natural Heritage, Visual Assessment of Wind Farms: Best Practice (2002);
- ▶ University of Sheffield and Landuse Consultants: Landscape Character Assessment – Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage (2002).

10. Historic Environment

10.1 Introduction and Overview

10.1.1 This chapter of the FEI sets out the findings of a review of the likely effects on the historic environment following the revision to the layout of the Proposed Development and should be read in conjunction with the ES, the revised scheme description in FEI **Chapter 4 -Description of the Proposed Development** and relevant consultation responses.

10.1.2 The key revisions to the Proposed Development include:

- ▶ A reduction in the maximum number of turbines (and associated infrastructure such as crane pads) from up to 19 to up to 16;
- ▶ 12 turbines have been moved from their previous locations by up to ~400 m;
- ▶ A reduction in the length of access tracks by ~800 m;
- ▶ A reduction in the number of watercourse crossings from six to five; and
- ▶ A reduction in the number of borrow pit search areas from three to two.

10.1.3 This chapter only sets out the conclusions and any changes to the assessment as a result of the revisions to the Proposed Development. The ES submitted with the application should be referred to for the details of the assessment methodology, baseline conditions and comprehensive assessment of effects. The assessment is only revisited here insofar as the Revised Layout of the Proposed Development alters the findings of the ES. This chapter includes a review of: current policy and guidance relating to the historic environment; potential direct effects on heritage assets in light of the Revised Layout; potential indirect effects on the setting of heritage assets in light of the Revised Layout; and consultation responses received in respect of the section 36 application.

10.2 Changes to Policy and Legislative Context

10.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.

10.2.2 In terms of legislation the changes come in the form of amendments to *The Ancient Monuments and Archaeological Areas Act 1979* and *The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997* which are the result of the Historic Environment Scotland Act 2014. This Act established the new governing body of Historic Environment Scotland, which although the Act was given Royal Assent on 9 December 2014, did not achieve its full statutory role until 1st October 2015 (Historic Environment Scotland, 2015). An overview is included in **Table 10.1**.

10.2.3 Relevant changes to national planning policy, advice and guidance (all coming as a result of the *Historic Environment (Scotland) Act 2014*) since the submission of the section 36 application are outlined in **Table 10.1**.

Table 10.1 Legislation and National Policy Changes Overview

Document referenced within Chapter 10 of the ES	Current Legislation / Policy or Amendment	Details
The Ancient Monuments and Archaeological Areas Act 1979; The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.	Historic Environment Scotland Act 2014.	This Act of the Scottish Parliament established Historic Environment Scotland (who replaced the former Historic Scotland); to make minor amendments to the law relating to the historic environment and for connected purposes. The Act sets out the functions of the organisation which includes protection of certain designated assets and makes provision for appeals of certain decisions of Historic Environment Scotland to the Scottish Ministers. In exercising its functions, Historic Environment Scotland must have regard: (a) to any relevant policy or strategy published by the Scottish Ministers; and (b) as may be appropriate in the circumstances, to the interests of local communities.
Scottish Historic Environment Policy (SHEP)	Historic Environment Scotland Policy Statement (HESPS)	The policy statement replaces the SHEP for operational matters. All references to <i>The Ancient Monuments and Archaeological Areas Act 1979</i> and <i>The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997</i> in this policy statement are to be read as having been amended by the Historic Environment Scotland Act 2014. This policy statement, the Scottish Planning Policy, Historic Environment Circular 1 and Historic Environment Scotland's Managing Change in the Historic Environment guidance note series (as confirmed in Planning Circular 9 2009) are the documents to which planning authorities are directed in their consideration of applications for conservation area consent, listed building consent for buildings of all three categories (see Note 2.17), and their consideration of planning applications affecting the historic environment and the setting of individual elements of the historic environment.
Managing Change in the Historic Environment: Setting	Managing Change in the Historic Environment: Setting (June 2016)	This guidance note has been revised to reflect the replacement of SHEP with the HESPS in June 2016.

10.2.4 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:

- ▶ Policy OP1: Overarching Policy;
- ▶ Policy RE3: Wind energy proposals over 50 metres in height;
- ▶ Schedule 1 – Renewable Energy Assessment Criteria;
- ▶ Policy ENV1: Listed Buildings;
- ▶ Policy ENV2: Scheduled Monuments and Archaeological Resources; and
- ▶ Policy ENV4: Gardens and Designed Landscapes.

10.3 Application Consultation

Responses

10.3.1 Three consultation responses to the section 36 application refer to the historic environment, these are outlined in **Table 10.2**.

Table 10.2 Consultation Points Raised in Relation to Historic Environment

Consultee	Point(s) raised	How it has been addressed
<p>Historic Environment Scotland (HES)</p>	<p>This response, dated 27th October 2015, relates to heritage assets contained within HES remit, these being scheduled monuments and their settings, category A listed buildings and their settings, inventory gardens and designed landscapes (GDL) and inventory battlefields. Advice to the Local Energy and Consents Unit (LECU) was provided with the recommendation to seek further advice from the West of Scotland Archaeology Service (WoSAS).</p> <p>Comments provided with regards to the adequacy of the ES stated that HES concluded that there is sufficient information to form a view on the Proposed Development. Having reviewed the ES Chapter, HES stated that they are in broad agreement with the conclusions presented. Comments were also provided in relation to two assets that were of particular interest to HES for which it was stated:</p> <ul style="list-style-type: none"> ▶ Craigengillan (GDL00111): 'While the visualisations provided as part of the LVIA Chapter (viewpoints 9 and 11) show that there will be an impact on the setting of the Inventory Designed Landscape, as well as the Dalnean Hill, farmstead and field system Scheduled Monument (SM4390), we are content to agree that the significance of effects in this case are not of an order to warrant an objection from Historic Environment Scotland'. ▶ Dumfries House (GDL00149): '<i>We are also content to agree that, due to the restricted visibility of turbines from the assets, that there will not be a significant effect on the setting of the Dumfries House GDL.</i>' <p>In summary HES stated that they are content that there is adequate information within the ES to come to a view on the application and did not wish to object.</p>	<p>Amec Foster Wheeler has taken note of the comments and assessment of the HES response and have included a further wireframe, FEI Figure 10.1, from Dalnean Hill within the Craigengillan GDL. Further cross-referencing to the LVIA chapter has also been incorporated into this chapter.</p> <p>WoSAS were contacted by Amec Foster Wheeler on the 1st September 2016 to enquire as to their response on the ES; this request was forwarded to Hugh McBrien of WoSAS on the 8th September 2016, but at the present time no response has been received despite a reminder having been issued on 3rd November 2016.</p>
<p>Carsphairn Community Council</p>	<p>Carsphairn Community Council responded on 6th November 2015 raising concerns with regards to the historical landscape, particularly relating to the name places of Enoch, Benty Cowan, Chang and High Chang which they state represent summit dedications to a once-revered Galloway poet and two early Christian Galloway Saints, all of whom belong to Carsphairn Parish tradition.</p> <p>Comments on the ES relate to paragraph 10.1.4 within the non-technical summary of the chapter which states:</p> <p><i>'While most previously known assets would not be affected by the Proposed Development, an earthwork boundary bank would probably be partially disturbed by the scheme. This asset would be considered of local importance at best and therefore not give rise to a significant effect.'</i></p> <p>The Carsphairn Community Council state 'that the proposed 'appropriate' mitigation measures do not make up for the disturbance of this earthwork</p>	<p>Amec Foster Wheeler has taken note of the comments and assessment of the Carsphairn Community Council response and appreciate their views on this.</p> <p>The place name evidence of the peaks contained within the Development Site are of interest, however, these associations rely entirely on place names which are not of definite derivation and are not linked with any material heritage assets that would be directly or indirectly affected by the Proposed Development. These names may have alternative derivations, and in the absence of any demonstrable direct association with material heritage assets which might be disturbed by the Proposed Development, or any change to these place names within the wider landscape, no adverse effects are anticipated.</p> <p>The language used within this FEI and the ES is due to compliance with language used within guidance on the assessment of the Historic Environment and the criteria as</p>

Consultee	Point(s) raised	How it has been addressed
	<p>boundary which should be left untouched.' They further comment that they find the statement to be dismissive of the vital research and interest in historical features that local people undertake to help preserve their heritage.</p>	<p>set out in Table 10.5 of Chapter 10 of the ES. These terms are designed to provide a clear assessment of the historic environment taking into account the importance of an asset and the magnitude of change anticipated. While we appreciate that the boundary bank (WoSAS reference 7988) is of interest to the local population, the guidance on the assessment of the Historic Environment and corresponding valuation criteria/language used to categorise assets results in a rating of local importance. As such the removal of a section of this feature, with the proposed mitigation in place, would be considered not to be significant in terms of the assessment.</p>
<p>Public Responses – Mark Gibson</p>	<p>Mr Gibson responded on 7th February 2016 raising a number of concerns in regards to the Proposed Development. Mr Gibson's response contained objections on a number of grounds including effect on the setting of the Craigengillan GDL and the Dalmellington Conservation Area, together with associated designated and non-designated assets contained within these designations. The objection stated numerous times that the turbines would <i>dominate and destroy the setting</i> of these assets.</p>	<p>Mr Gibson's response states on numerous occasions his views that the Proposed Development would have negative impacts upon the surrounding area and in particular the Craigengillan GDL and the neighbouring Dalmellington Conservation Area although the rationale for these opinions have not been provided. The mention of the setting of numerous assets has been stated as at risk but no definition of these settings is provided.</p> <p>In the case of numerous assets mentioned such as the Dalmellington Conservation area and the assets contained therein, the Zone of Theoretical Visibility to Blade Tip as shown on Figure 9.2 of the ES illustrate that there would be no visibility of the turbines. This is also the case for Revised Layout as demonstrated by FEI Figure 10.1. With regards to the Craigengillan GDL, further assessment is provided below.</p> <p>Mr Gibson also states that '<i>Views from the greater part of the Designed Landscape would suffer severe adverse visual impact from the turbines, as the Environmental Statement confirms</i>'. This statement refers to the cumulative assessment of effects on Craigengillan provided within Chapter 9 of the ES (Landscape and Visual), which stated the level of effect would range from Substantial/Moderate and significant for existing and consented sites and substantial and significant to no view for existing, consented and application wind farms (page 9-78 of ES). This assessment referred to the landscape and visual impact assessment and rather than to the historic environment and the setting of specific heritage assets. As such the assessment contained within Chapter 9 of the ES was undertaken using the methods set out within that chapter.</p> <p>The visual effects on Craigengillan are discussed further in Table 9.14 of Chapter 9 (Landscape and Visual) of the FEI. The cumulative effects for the Historic Environment on Craigengillan are discussed further below.</p>
<p>West of Scotland Archaeology Service</p>	<p>N/A</p>	<p>No response to the section 36 application was received from WoSAS and further consultation by Amec Foster Wheeler prompted by Historic Environment Scotland's has been acknowledged, but no comments have been received.</p>

10.4 Implications of Revised Layout

- 10.4.1 The implications of the Revised Layout for the Proposed Development predominantly relate to the reduction in visibility of turbines from receptors in the wider area. Although the new ZTV figures (**Figures 9.2 and 9.3**) presented within FEI **Chapter 9** show visibility occurring within similar areas as the Original Layout, this visibility is generally of a reduced number of turbines. In broad terms, areas that formerly had the potential for visibility of 10-14 turbines would now have potential visibility of 9-12 turbines, and similarly where 15-19 turbines would have been visible this has been reduced to 13-16 turbines. This reduction in visibility would reduce the indirect effects of the Proposed Development on heritage assets contained within the study area and these changes are discussed in more detail below.
- 10.4.2 With regards to direct effects, the Revised Layout of the Proposed Development does not affect any known assets which would not have been affected by the Original Layout. Turbine 2 is slightly closer to the non-designated sheepfold (Reference DBA12) to the north, although it still remains c. 350 m away. The potential to disturb as yet unknown sub-surface archaeological remains has been reduced due to the decreased area of land take required as a result of three fewer turbines and associated hardstanding, reduced track length and the number of borrow pit search areas being reduced from three to two.

10.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

Operational

- 10.5.1 Operational effects of the Proposed Development would be indirect as direct effects would occur during the construction phase of works. In this context, indirect effects result from effects on the setting of heritage assets. The definition for setting used within the ES was taken from former Historic Scotland guidance which has now been updated with the publication of *Managing Change in the Historic Environment: Setting* (Historic Environment Scotland, 2016). The current guidance states that setting 'often extends beyond the property boundary or 'curtilage' of an individual historic asset into a broader landscape context. Both tangible and less tangible elements can be important in understanding the setting. Less tangible elements may include function, sensory perceptions or the historical, artistic, literary and scenic associations of places or landscapes'. These aspects were considered within the ES as part of the analysis of key aspects of setting and as such, the assessment previously presented is considered to be consistent with current guidance.
- 10.5.2 The ES considered in detail the operational effects on the heritage assets that were identified as requiring further assessment through consultation with Historic Scotland (now Historic Environment Scotland) and WoSAS. These assets consisted of:
- ▶ Craigengillan GDL, together with the Category A listed Craigengillan House (HES reference LB18793) and stables (HES reference LB18794). Consideration was also given to further assets contained within the designated landscape as part of the further assessment;
 - ▶ Dumfries House and associated assets contained within the designated area;
 - ▶ Beoch Cairn (WoSAS reference 7989); and
 - ▶ Fardenreoch Cairn (WoSAS reference 8018).
- 10.5.3 The ES considered the assets importance, current setting, potential change to setting and the significance of effects during the operational phase of the Proposed Development. No significant effects to these assets were identified in the assessment.
- 10.5.4 The operational effects on the Craigengillan GDL together with the assets contained therein were assessed as low. Although turbines would appear in sequential views and behind the higher ground to the east of the designed landscape, they would not discernibly affect the key values of the asset. In some locations, particularly Craigengillan House and stable, no visibility of the

turbines was expected as demonstrated by the wireframe images provided as **Figures 10.3a** and **10.3b** of the ES.

- 10.5.5 In response to the consultation response from Historic Environment Scotland and to provide clarification of the assessment, an additional wireframe, FEI **Figure 10.1**, has been provided. The viewpoint for the additional wireframe figure is located at the top of Dalnean Hill, one of the areas of higher visibility within the designed landscape and a scheduled monument (HES reference SM4390). The wireframe image gives an idea of the 'worst case' visibility from the scheduled area and although there would be visibility of all 16 turbines, they all appear as distant features with a further sense of separation provided by the higher land in the foreground which screens the lower portion of the turbines. Existing vegetation around Craigengillan would also mean that these distant views are further filtered as the visitor moves around the designed landscape. The findings of the ES in relation to the operational effects of the Proposed Development remain unchanged and no significant adverse effects are anticipated.
- 10.5.6 Due to the reduction in the number of turbines and the nature of the current setting, condition and screening of Beoch Cairn and Fardenreoch Cairn as set out in the ES, operational impacts of the Proposed Development remain unchanged from the findings of the ES and no significant adverse effects are anticipated. The distance to the turbines and angle of view of turbines will remain unchanged from these assets and the number of turbines visible would either be comparable to the original assessment or reduced in some cases. Due to the reduction in the number of turbines and the similarity of visibility, the findings of the ES also remain unchanged for Dumfries House and no significant adverse effects are anticipated.

Construction

- 10.5.7 Predicted construction effects of the Proposed Development would consist of direct effects on known and unknown heritage assets within the Development Site. Direct effects are expected on a boundary bank (WoSAS reference 7988) with the installation of access tracks and borrow pits and Turbine 6 remains in close proximity to a modern cairn which was identified during a walkover of the Development Site undertaken as part of the ES (Reference DBA37). This boundary bank is considered to be of local importance, with the cairn of lesser importance, and mitigation measures suggested within the ES are considered appropriate and could be made the subject of a planning condition.
- 10.5.8 The potential for effects on as yet unknown archaeological remains within the Development Site is reduced by the reduction in the number of turbines, track length and borrow pits. The assets contained within the Development Site boundary are of a nature that are not suggestive of the presence of further extensive archaeological remains, with any features present expected to be in isolated locations. The mitigation measures suggested within the ES for as yet unknown archaeological remains are considered appropriate and could also be made the subject of a planning condition. Because the heritage assets that are known within the site are of a local or lesser importance, any as yet unknown archaeological remains would likely be of a similar nature and significant effects therefore remain unlikely.

Decommissioning

- 10.5.9 The ES states that the decommissioning of the Proposed Development will effectively reverse any indirect effects of the scheme and will not give rise to any adverse changes; this assessment remains the same. As any direct effects within the site would occur during construction, these effects would have been mitigated at this stage and any further disturbance on known or unknown archaeological remains as a result of the removal of materials as part of the decommissioning would be of small and isolated areas at worst. Any archaeological remains that are not yet known would be recorded during mitigation carried out during construction and would be expected to be of local or lesser importance due to the nature of known assets within the site. The importance of the assets contained means that any further disturbance could be mitigated in a similar fashion to that used during construction and it is unlikely that significant effects would occur.

Cumulative

- 10.5.10 The assessment within the ES stated that the cumulative effects arising from the addition of the Proposed Development to a baseline including other operational, consented or submitted schemes would be of insufficient magnitude to give rise to a significant effect. The wind farms that could contribute to cumulative indirect effects on the historic environment considered within the ES have not changed and as such, the results of the cumulative assessment within **Chapter 10** of the ES remain unchanged.
- 10.5.11 In respect of Craigengillan GDL, **Chapter 10** of the ES concluded that 'any cumulative effects arising from the addition of the Proposed Development would be of insufficient magnitude to give rise to a significant adverse cumulative effect on the setting of the asset' and this remains the case. No significant cumulative effect would arise as the result of the addition of the Proposed Development to a baseline including the developments considered in **Chapter 10** of the ES.
- 10.5.12 With regards to the remaining cumulative assessments contained within **Chapter 10** of the ES, due to the reduction in the number of turbines and the lack of additions to the cumulative baseline presented, the findings of the ES in respect of Beoch Cairn, Fardenreoch Cairn and Dumfries House remain unchanged. As such significant cumulative effects are unlikely.

10.6 Evaluation of Residual Effects

- 10.6.1 The summary of residual effects remains unchanged from those provided within **Chapter 10** of the ES. No significant adverse effects will arise in respect of the historic environment.

10.7 Conclusions

- 10.7.1 Any effects arising from the revised design of the Proposed Development are predicted to be of comparable or of slightly reduced magnitude to those caused by the Original Layout. No significant adverse effects on heritage assets were identified by the assessment of the Original Layout submitted as part of the section 36 application and no significant adverse effects on heritage assets are anticipated to arise from the Revised Layout of the Proposed Development.

10.8 References

Documentary Sources

Historic Environment Scotland, 2015. *A New Lead Public Body for the Historic Environment*. Historic Environment Scotland.

Historic Environment Scotland, 2016. *Managing Change in the Historic Environment: Setting*. Historic Environment Scotland.

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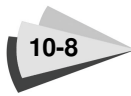
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11. Ecology

11.1 Introduction and Overview

- 11.1.1 This Chapter of the FEI assesses the implications of the 16 turbine Revised Layout described in FEI **Chapter 4 - Description of the Proposed Development** on ecological receptors.
- 11.1.2 Field surveys reported in the ES were undertaken between 2012 and 2015 inclusive. Additional surveys were undertaken in 2016 for otter/water vole to update previous surveys and the results of these are reported within this chapter. Surveys are therefore considered up to date and to provide a suitable baseline from which to assess potential impacts on ecological receptors as a result of the Proposed Development.
- 11.1.3 The key revisions to the Proposed Development are described in FEI **Chapter 4** and include a reduction in the number of turbines (and associated infrastructure such as crane pads) from up to 19 to up to 16; a reduction in the length of access tracks by ~800 m; a reduction in the number of watercourse crossings from six to five, and a reduction in the number of borrow pit search areas from three to two. Of the remaining 16 turbines, some have moved from their previous locations, by up to ~400 m.
- 11.1.4 Comments made by Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA), Galloway Fisheries Trust (GFT) and Marine Science Scotland (MSS) in relation to the Original Development and the ES are also considered in this Chapter.

11.2 Changes to Policy and Legislative Context

- 11.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 11.2.2 Relevant changes to national planning policy, advice and guidance since the submission of the section 36 application are:
- ▶ Publication of a new version of *Good Practice During Wind Farm Construction* (Scottish Renewables / SNH / SEPA / Forestry Commission / Historic Scotland (2015); and,
 - ▶ Publication of the Carbon and Peatland Map 2016 (Scottish Natural Heritage, June 2016).
- 11.2.3 The new version of *Good Practice During Wind Farm Construction* (contains a reviewed Woodland Management chapter, and Habitat Restoration chapter. It also contains a new chapter that considers Biosecurity and the management of invasive non-native species. Other chapters throughout have been refreshed and updated. These changes have been considered in relation to the Proposed Development and no amendments to the Proposed Development are required to address these updated sections.
- 11.2.4 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
- ▶ Policy OP1: Overarching Policy;
 - ▶ Map 12: Spatial Framework for Wind Energy Development over 50m in height and supporting paragraphs 6.1.10 - 6.1.11;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height;

- ▶ Schedule 1 – Renewable Energy Assessment Criteria;
- ▶ Policy TOUR5: Galloway and Southern Ayrshire Biosphere;
- ▶ Policy ENV6: Nature Conservation;
- ▶ Policy ENV9: Trees, Woodland and Forestry; and,
- ▶ Policy ENV10: Carbon Rich Soils.

11.3 Application Consultation Responses

11.3.1 **Table 11.1** documents the points raised by SNH, SEPA, MSS and GFT in relation to ecological aspects reported in the ES.

Table 11.1 Consultation Points Raised in Relation to Ecological Receptors

Consultation response	Response	Actions
<p>SNH: Bats</p> <p><i>“Given the potential for effects on Nyctalus bats we advise that there is an unquantified risk of a negative effect on their conservation status in Scotland. This could be avoided by shutting the turbines down for a period of 3 hours following sunset, during the period from June to August inclusive, whenever wind speeds are less than 6 metres per second (i.e. when conditions are most likely to encourage Nyctalus bats to forage).”</i></p> <p><i>“We note that the Bat Survey Report 2013 (ES Appendix 11.D, section 4) suggests that the proposed site is a summer foraging site for bats. The July 2013 activity figures reported in Table B.1 are 844 passes over 5 nights in July (792 Leisler’s bats plus 52 Nyctalus sp). We’ve tabulated the 2013 data below to help us consider the average number of passes per detector per night. It clearly shows a very high average number of passes/detector/night for July. Unfortunately no surveys were carried out during June or August and it would have been beneficial if this survey data was available. We advise that the other Summer months June and August might also have similar activity levels but the data are missing (the Spring count only went up to 4 June), and so shutdown mitigation should also apply to these months, unless pre/post construction survey shows otherwise.”</i></p> <p><i>“The survey data shows that the Nyctalus activity is concentrated along the western edge of the site, with low levels of activity in the centre and eastern half of the site. Ninety six per cent of the Nyctalus passes in 2013 were from detector locations 1 and 4 (Blood Moss and Logan Hill), and there were very low numbers of Nyctalus passes recorded from the continuous at height surveys carried out from July to October 2014 from the two met masts in the centre of the site (only 9 passes for the whole period). It is possible that there may be scope to select particular turbines for shutdown that present most of the risk rather than apply shutdown to all of the turbines in the development. The applicant may be able to demonstrate this through current and future survey results.”</i></p>	<p>The scope of surveys undertaken (which was based on the presence of homogenous habitats, the results of earlier studies and the presence of higher value habitat elsewhere around the Development Site, as detailed in ES Appendix 11.D and 11.E), had been approved by way of the scoping process (see Table 2.4 of ES Chapter 2). Seasonal (spring, summer and autumn) bat surveys following the methods recommended for low risk sites as detailed in the prevailing Bat Conservation Trust guidelines were completed in accordance with this guidance.</p> <p>The presence of comparatively high numbers of <i>Nyctalus</i> sp. bat passes during the July surveys was acknowledged in the ES (paragraph 11.4.25) and in ES Appendices 11.D and 11.E and a curtailment regime is set out in Section 11.5.24 of this chapter.</p>	<p>Curtailment of turbines T1, T3, T4 and T16 between June – August inclusive for three hours after sunset when wind speeds are below 6m/s. to be secured through Planning Condition.</p>

Consultation response	Response	Actions
<p>SNH</p> <p><i>We also recommend that post-construction monitoring of bat activity and mortality should be carried out for a minimum of three years to inform possible modifications to the shutdown regime. We would be happy to advise on the details of any subsequent post construction monitoring.</i></p>	<p>A post-construction monitoring strategy would be developed in line with relevant prevailing Bat Conservation Trust (BCT) and / or SNH guidance. It is anticipated that operational phase monitoring would involve, as a minimum, ground level static detector surveys utilising areas below turbines coupled with "control" sites away from turbines. Use would also be made of permanent met masts where possible.</p>	<p>Commitment to be secured through Planning Condition.</p>
<p>SNH</p> <p><i>"We largely agree with the assessment of effects on other natural heritage interests and with the proposed suite of mitigation measures. We recommend that the full range of ecological mitigation and enhancement measures identified in the ES is implemented."</i></p>	<p>The ecological mitigation and enhancement measures detailed in Section 11.10 of the ES will be implemented in the event that the Proposed Development is constructed.</p>	<p>Commitment to be secured through Planning Condition.</p>
<p>SNH</p> <p><i>"Evidence of otter and water vole was found during the course of the surveys and the site was identified as having low to moderate potential to support these species. The potential for badgers on site was identified as being negligible to low. We welcome the recommended pre-construction checks as identified in section 11.4, table 4.1 of the ES and suggest that these are carried out within eight months preceding the commencement of construction."</i></p>	<p>The Applicant has agreed to prepare a Construction Environment Management Plan (CEMP) which would detail species protection plans for otter and water vole within the Development Site boundary. A suitably qualified Environmental Advisor/Ecological Clerk of Works would also be appointed for the duration of the works and responsible for ensuring that all construction-phase surveys, checks, monitoring and any relevant mitigation would be adhered to in accordance with the CEMP. The pre-construction surveys would be undertaken for all protected species to inform the development of the CEMP which is a standard requirement in wind farm planning conditions.</p>	<p>Commitment to be secured through Planning Condition.</p>
<p>SNH: Deer</p> <p><i>SNH Stated "We recommend that an assessment of the potential impacts on wild deer should be provided prior to construction commencing, and if adverse impacts are predicted, then the applicant should also at that stage provide a deer management statement."</i></p>	<p>The land at the Development Site is not managed for deer and there were no recorded deer sightings during numerous surveys for protected species, habitats and birds between 2012 and 2015 inclusive. Many of these surveys were undertaken during the dusk and dawn periods, which is the optimum time to record deer, if present. This indicates that impacts on deer are very unlikely. Further consideration would be given to deer prior to construction, and a Deer Management Statement prepared, if required.</p>	<p>n/a</p>
<p>MSS: Fish baseline data</p> <p><i>"Seeking up to date fish population data from the Nith Catchment Fisheries Trust/Nith District Salmon Fishery Board, as recommended in the report by Amec [i.e. ES Appendix 11.F] would provide a more robust baseline database for fish populations in watercourses potentially impacted as a result of the proposal both within and downstream of the development site and at control sites".</i></p> <p><i>"In summary given the importance of salmonid populations within the River Nith catchment and the international importance of salmon populations, there is insufficient information in the ES regarding site characterisation data for</i></p>	<p>There was an initial recommendation for additional data gathering made within ES Appendix 11.F, to which MSS refer. After ES Appendix 11.F was prepared, a data request was sent to Nith District Salmon Fishery Board (NDSFB) via e-mail on 24/03/2014, enquiring about fish populations within the Nith catchment and the watercourses within the Enoch Hill wind farm site boundary.</p> <p>Jim Henderson (NDSFB - Fishery Director) stated that while NDSFB had historical data for these watercourses, it was recommended that a site-specific electrofishing survey would be the best</p>	<p>n/a</p>

Consultation response	Response	Actions
<p><i>water quality and fish populations. These data should be sought for fish populations within and downstream of the proposed development site, out with drought conditions".</i></p>	<p>approach to this project (rather than reliance on existing data) because:</p> <ul style="list-style-type: none"> • <i>A site-specific survey would gather present day baseline data, as opposed to historical data. Pollution events on this system can change fish populations in short timeframes (e.g. months) and present day data would be far more meaningful for the development; and</i> • <i>The most recent data that NDSFB hold (2013) is for survey sites just outwith the proposed site boundary, so are not ideal.</i> <p>Based on this advice, site-specific surveys were undertaken instead of reliance upon existing data which ensured that the information presented and assessed in the ES represented the most up to date fish population data. These data were provided within ES Appendix 11.G which supported the conclusion presented in the ES that there would be no significant effects on fish.</p>	
<p>MSS: Water quality data</p> <p><i>"Insufficient water quality information (including turbidity and flow/stage data) is provided in the ES to characterise the watercourses within and downstream of the proposed development area and to assess the potential impacts of the development on the water quality".</i></p> <p><i>"Furthermore no details regarding a water quality monitoring programme during and after construction are provided. We attach a document* prepared by MSS outlining a full description of an integrated monitoring programme (water quality, macroinvertebrate and fish populations) which can be consulted in preparation of a site specific monitoring programme for the proposed development. The potential impact of adjacent wind farms should be considered in the design of the monitoring programme, particularly in the selection of the control sites. We recommend the existing water quality issues due to the presence of surface coal mining and acid rich waters resulting from forestry clearance, to be considered in the monitoring programme".</i></p> <p>*Generic Monitoring Programme document</p>	<p>The water quality information provided in the ES was compliant with the original scoping response from MS (dated November 2012), and was sufficiently detailed to inform the impact assessment.</p>	<p>It is suggested that a monitoring programme at on-site locations and / or publicly accessible off-site locations be secured by a planning condition if the Proposed Development is granted consent. This would be compatible with MS's original scoping response request for a monitoring programme, and would also address the requirements of the GFT (see below). It is assumed that if secured by a planning condition, MS would be allowed an opportunity to comment on the details of the monitoring programme prior to its implementation.</p>
<p>GFT, regarding monitoring:</p> <p><i>"On behalf of the DDSFB we would like to have the opportunity to agree a pre-construction,</i></p>	<p>This is in line with findings and recommendations of the ES which specify that a CEMP would be put in place for the whole period of construction, setting out any specific environmental management</p>	<p>It is suggested that CEMP requirements for aquatic monitoring be secured by a planning condition if the Proposed Development is granted consent. It is assumed that if secured by a planning condition,</p>

Consultation response	Response	Actions
<i>during construction and post-construction monitoring programme, especially since some infrastructure does now lie within the watershed of the Dee catchment."</i>	requirements such as ECoW requirements for aquatic monitoring and protection measures, pollution control and contingency procedures.	GFT would be allowed an opportunity to comment on the details of the monitoring programme prior to its implementation.
GFT, regarding watercourse buffer zones: <i>"It is appreciated that a buffer zone of 50m will be applied around all tributaries and watercourses in the area but we suggest that this is an absolute minimum. Due to the likely occurrence of adverse weather episodes during the excavation of turbine bases 6, 7 and 19, and their corresponding access roads, combined with the nature of the gradient in the area, it is very likely that silt and/or pollution will run downhill to watercourses. Therefore we request that the turbines 6, 7 and 19 are re-positioned with a buffer of 100m to the nearest watercourse in addition to putting in place adequate mitigation measures to ensure no silt or pollution is allowed to enter any watercourse in the Dee catchment".</i>	Whilst a 50m buffer was applied to the Dee catchment watercourses, in fact all three turbine bases (now numbered 6, 7 and 16) and their access roads lie 100m or more away from any watercourses, and their locations have not changed significantly for the revised Proposed Development.	n/a
SEPA: Groundwater Dependent Terrestrial Ecosystems (GWDTEs) SEPA summarises the findings of the GWDTE assessment in ES Chapter 13 . In SEPA's opinion the direct impacts on the three habitats Amec Foster Wheeler identified as being groundwater dependent will be adequately mitigated by the measures presented in Table 4.1 of the GWDTE assessment, within Appendix 13.B of the ES.	The ES reflects SEPA's conclusions.	Mitigation measures relating to GWDTEs, as specified in the ES, to be incorporated in to the CEMP.

11.4 Implications of Revised Layout

- 11.4.1 The 16 turbine Revised Layout (illustrated in FEI **Figure 1.2**) remains broadly similar to the 19 turbine Original Layout (illustrated in FEI **Figure 1.1**), with removal of turbines from the eastern edge of the array and some of the remaining turbines having moved from their previous locations by up to ~400 m. The access route between the remaining 16 turbines and the road network remains largely unchanged (apart from a reduction in overall land-take), as does the location of two remaining borrow pit search areas (the third search area reported in the ES having been deleted), temporary construction compound and substation.
- 11.4.2 In Section 11.5 predicted effects on the VERs have been re-assessed in light of the Revised Layout. It is anticipated that due to no substantive change in layout, the impacts on ecological interests are likely to remain largely as described in **Chapter 11** of the ES, albeit with slightly reduced impacts in respect of habitat loss for example.

11.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

Construction, Operational and Decommissioning Disturbance Effects

- 11.5.1 Following the assessment methodology set out in Section 11.3 of the ES, the VERs taken forward for assessment in **Chapter 11** of the ES were:
 - ▶ Mire communities: M17 *Trichophum germanicum* – *Eriophorum vaginatum* blanket mire; M20 *Eriophorum vaginatum* blanket mire; and M25 *Molinia caerulea* – *Potentilla erecta* blanket mire;

- ▶ Running water; and
- ▶ Otter.

11.5.2 With respect to species, only otter was considered to be a VER within the context of the assessment methodology set out in Section 11.3 of the ES. However, the presence or potential presence of other species that are afforded legal protection were also included in the assessment:

- ▶ Water vole;
- ▶ Bats: Common pipistrelle; soprano pipistrelle; *Myotis* bat species; *Nyctalus* bat species; and *Plecotus* bat species;
- ▶ Badger;
- ▶ Herpetofauna;
- ▶ Salmonids; and
- ▶ Freshwater pearl mussel.

11.5.3 GWDTes were also included in the impact assessment.

Mire communities

11.5.4 Permanent VER habitat losses (i.e. M17, M20 and M25 mire communities) are shown in **Table 11.2**, which also shows the difference in permanent habitat losses between the Revised Layout and the Original Layout.

Table 11.2 Permanent VER Habitat Losses (ha) of the Revised Layout Compared with the Original Layout

Infrastructure Component	M17	M17/M20	M17/M23b	M17a	M20	M20/M17	M20 - M17 - M23b	M20 - minor M23b	M20 - minor M23b and U6
Turbine bases x 16	0.09				0.25	0.20		0.05	0.10
Crane pads x 16	0.01	0.12		0.03	0.63	0.24		0.13	0.25
New (cut) access track	0.46	0.30		0.09	2.66	1.91	0.23	0.05	0.42
Passing places x 24	0.04	0.04			0.04	0.04	0.04		0.04
Sub-Station, Control Building & Transformers					1.95				
2 permanent met masts					0.05				
Totals Revised Layout	0.60	0.46	0.00	0.12	5.58	2.39	0.27	0.22	0.81
Totals Original Layout	0.89	0.63	0.03	0.08	5.67	2.45	0.31	0.20	0.82
Difference (Original Layout – Revised Layout)	-0.29	-0.17	-0.03	0.04	-0.09	-0.06	-0.04	0.02	-0.01
NVC Plant Communities:									
M17: <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire									
M17a: <i>Trichophorum germanicum</i> – <i>Eriophorum vaginatum</i> blanket mire (<i>Drosera rotundifolia</i> – <i>Sphagnum</i> spp. sub-community)									
M20: <i>Eriophorum vaginatum</i> blanket mire									
M23b: <i>Juncus effuses</i> / <i>acutiflorus</i> – <i>Galium palustre</i> rush-pasture (<i>Juncus effusus</i> sub-community)									

Infrastructure Component	M17	M17/M20	M17/M23b	M17a	M20	M20/M17	M20 - M17 - M23b	M20 - minor M23b	M20 - minor M23b and U6
U6: <i>Juncus squarrosus</i> – <i>Festuca ovina</i> acid grassland									

- 11.5.5 It can be seen that there is a reduction in the area of permanent loss of VER habitat communities in most instances, with a net reduction of 0.62 hectares (ha) across all VERs. It is therefore considered that effects (during construction and operation) will be similar (or potentially reduced) when compared to those reported in the ES, i.e. ‘**not significant**’ in EIA terms.
- 11.5.6 In addition to the permanent VER habitat losses set out in this table, it is expected that temporary disturbance or loss will occur due to the temporary construction compound, two borrow pits and within adjacent plant communities due to construction activities, particularly for new access tracks where a temporary working corridor of up to 25m may be required before reinstatement to leave access tracks at a maximum of 6m wide (excluding corners and passing places). Temporary disturbance/losses of up to 50m are expected around the infrastructure including turbine foundations and bases, crane pads and the control building compound.
- 11.5.7 Temporary disturbance or loss of VER habitats (i.e. habitats that will be reinstated following construction) are expected to be in the region of 21 ha, as shown in **Table 11.3**.

Table 11.3 Temporary VER Habitat Losses (ha) of the Revised Layout

Infrastructure Component	Habitat Loss (ha)
Borrow pit A	0.75
Borrow pit B	0.57
Temporary construction compound	0.73
Turbine bases x 16	0.66
Crane pads x 16	0.25
New access track	17.77
Sub-Station, Control Building & Transformers	0.30

- 11.5.8 As these figures are similar to those reported in the ES, it is therefore considered that effects (during construction) will be similar (or potentially reduced) when compared to those reported in the ES, i.e. **not significant** in EIA terms.

GWDTEs

- 11.5.9 The GWDTE assessment in the ES (ES **Appendix 13.B**) identified three ‘true’ GWDTEs. The ‘true’ GWDTEs were described in **Chapter 13** of the ES and are shown in FEI **Figure 13.1** along with a 100m and 250m buffer and the Zone of Contribution (ZoC) associated with each.
- 11.5.10 No infrastructure is proposed to be located within the ZoC of these three “true” GWDTEs, therefore, the level of effect on is concluded to remain as **not significant** in EIA terms.

Running Water, Salmonids and Freshwater Pearl Mussel

- 11.5.11 The Proposed Development has been designed to avoid the buffer areas applied to watercourses. In line with the ES, a 100m buffer was set for watercourses in the River Nith catchment, and a 50m buffer for watercourses in the Water of Deugh catchment.
- 11.5.12 The 100m buffer for watercourses in the River Nith catchment was set on a precautionary basis due to the presence of sensitive salmonid populations in the catchment. However, as stated in ES **Appendix 11.G** "*The Little Chang, Catlock and the un-named tributary of the Little Chang do not contain suitable habitat for fish to inhabit*". As a result, the application of a more standard 50m buffer to those watercourses is considered suitable; turbines T2 and T5 are located outside this 50m buffer and all other turbines are over 100 m from watercourses.
- 11.5.13 The revised track layout has followed the same routes, but as mentioned earlier, the total length of track is reduced by ~800 m (from ~12.9 km to ~12.07 km) and the number of watercourse crossings has reduced from six to five. The southernmost borrow pit search area has been removed from the Revised Layout.
- 11.5.14 Overall, the reduced number of turbines, the removal of one planned borrow pit search area, the reduced number of watercourse crossings and the reduced length of track contribute to an overall reduction in the probability of effects on running water, salmonids and freshwater pearl mussel.
- 11.5.15 The revisions to the layout do not alter the conclusions of the ES with respect to running water, salmonids and freshwater pearl mussel. The level of effect on these receptors, for all phases of the Proposed Development, is concluded to remain as **not significant** in EIA terms.

Otter and Water Vole

- 11.5.16 Otter surveys were updated between 26 and 28 September 2016 to ensure the baseline was sufficiently recent to fully re-assess the implications of the Revised Layout in respect of this highly mobile European Protected Species (EPS). During this survey update, signs of water vole were also searched for.
- 11.5.17 All suitable habitat within 100m of tracks and 250m of other infrastructure was surveyed according to standard survey guidance (Chanin, 2003a&b and Strachan *et al.* 2011) and particular attention was paid to the five proposed watercourse crossing points.
- 11.5.18 No water vole signs were recorded and otter signs were limited to sprainting sites and potential resting site habitat. Results were therefore similar to those of the previous surveys undertaken between 2011 and 2015 inclusive, thereby demonstrating that the baseline relating to these two species had not changed since the ES was submitted.
- 11.5.19 Overall the reduced number of turbines, the removal of one planned borrow pit search area, the reduced number of watercourse crossings and the reduced length of track contribute to an overall reduction in the probability of effect on otter and water vole.
- 11.5.20 It is considered that the deletion of three of the turbines, the reduction in access track length, the reduced number of watercourse crossings together with the removal of one borrow pit search area, will potentially reduce the level of effects as reported in the ES, which will remain **not significant** in EIA terms.

Badger and Herpetofauna

- 11.5.21 The Revised Layout will result in a reduction in the area of suitable habitat that will potentially be lost to these species. Therefore, the level of effects presented in **Chapter 11** of the ES remains valid, i.e. **not significant** in EIA terms.

Bats

- 11.5.22 It was not considered necessary to undertake additional surveys for bats because Section 2.6.3 (pages 20 and 21) of the current Bat Conservation Trust (BCT) *Good Practice Guidelines* (3rd

- Edition) states that “*the length of time [bat] survey data remains valid should be decided on a case-by-case basis and is dependent upon a number of questions*”. The questions provided in the BCT guidance in relation to the Proposed Development and the Revised Layout were considered and it was determined that bat surveys did not require updating. This is because the surveys were carried out according to good practice guidelines; the results obtained were not constrained and supported the original initial assessment of the value of the Development Site for bats (i.e. Low); the nature of the site and surrounding area has not changed since the original surveys; and additional surveys are unlikely to provide further information that would be material to a decision (i.e. planning consent).
- 11.5.23 It is considered that none of the changes to the Original Layout would alter or increase the level of adverse effects on species of bat that were recorded in relatively low numbers, i.e. common and soprano pipistrelle, *Myotis* and *Plecotus* sp. bats, i.e. effects remain **not significant** in EIA terms.
- 11.5.24 The presence of comparatively high numbers of *Nyctalus* sp. bat passes during the July 2013 surveys was of concern to SNH as noted in **Table 11.1**. The survey results in ES **Appendices 11.D** and **11.E** inferred that the proportion of bat activity appeared highest during the summer period and on Blood Moss, Knockburnie Burn and woodland edge along Logan Hill.
- 11.5.25 Linking bat activity to wind speed at the anemometry (met) masts indicated that bat activity dropped off when the wind speed was higher on average than 6 m/s; the data for Leisler’s bat suggested a reduction in activity at even lower wind speeds. With bat activity (particularly for Leisler’s bat/*Nyctalus* sp.) on the western edge of the site being comparatively high, the risks posed to this species group during the summer months appears to be potentially high, although as concluded in the ES, in view of the very low number of high risk species recorded, it is considered that the operation of the Proposed Development (with no curtailment) will have no greater than a ‘small’ adverse magnitude of change on high risk species or populations, resulting in a ‘negligible’ adverse effect that is **not significant** in EIA terms.
- 11.5.26 These records of Leisler’s bat came from detector locations corresponding approximately with proposed turbines T1, T3, T4 and T16 on the western edge of the site. An analysis of possible curtailment options including standardised and site-specific options has been undertaken and it is proposed that turbines T1, T3, T4 and T16 would be curtailed between June – August inclusive for three hours after sunset when wind speeds are below 6m/s. It is anticipated that the implementation of this curtailment regime would further reduce the risks to high risk species.

Cumulative

- 11.5.27 The cumulative assessment presented in the ES concluded that significant effects are unlikely. This assessment remains valid for the Revised Layout, since no new developments are have been submitted within the 5km search area used to determine the cumulative effects presented in the ES.

11.6 Evaluation of Residual Effects

- 11.6.1 Based on the provision of all mitigation measures discussed in the ES Section 11.10 (including the summary of all mitigation measures proposed in ES Table 11.13), in addition to the curtailment detailed in above in respect of bats, the conclusions regarding residual effects remain the same as in the ES. Residual effects for all receptors and all phases of development are therefore concluded to be **not significant** in EIA terms.

11.7 Conclusions

- 11.7.1 The Revised Layout has been assessed with regard to ecology. The reduced number of turbines and borrow pits, and associated reduction in overall track length and fewer watercourse crossings, reduces the overall potential for effect. Overall, there is no change to the conclusions from the ES, with all residual effects concluded to be **not significant** in EIA terms.

11.8 References

Bat Conservation Trust, 2016, Good Practice Guidelines, 3rd Edition

Chanin P (2003a) Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series No. 10. English Nature, Peterborough.

Chanin P (2003b) Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. English Nature, Peterborough.

Enoch Hill Wind Farm Environmental Statement, Volume 1: Main Report. September 2015. Amec Foster Wheeler on behalf of E.ON.

Strachan R, Moorhouse T, Gelling M. 2011. Water Vole Conservation Handbook. 3rd edition. Wildlife Conservation Research Unit: Oxford.

12. Ornithology

12.1 Introduction and Overview

- 12.1.1 This Chapter of the FEI assesses the implications of the revised 16 turbine layout (described in FEI **Chapter 4**) for the ornithological receptors at the Development Site. Field surveys were undertaken during each non-breeding and breeding bird survey season between autumn 2011 and spring 2014 and therefore all survey seasons other than winter 2011/12 are less than five years old and provide a suitable baseline from which to assess potential impacts of the Revised Layout on birds.
- 12.1.2 Comments made by Scottish Natural Heritage (SNH) and the Royal Society for the Protection of Birds (RSPB) in relation to ornithological aspects reported in the ES are also addressed in this Chapter.

12.2 Changes to Policy and Legislative Context

- 12.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 12.2.2 At the national level, the key SNH guidance documents referred to within Chapter 12 of the ES remain unchanged (i.e. SNH (2004) and SNH [2006]). The only relevant change to national planning policy, advice and guidance since the submission of the section 36 application is that a new version of *Good Practice During Wind Farm Construction* (Scottish Renewables / SNH / SEPA / Forestry Commission / Historic Scotland) was published in September 2015.
- 12.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
 - ▶ Policy OP1: Overarching Policy;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height;
 - ▶ Schedule 1 – Renewable Energy Assessment Criteria and,;
 - ▶ Policy ENV6: Nature Conservation.

12.3 Application Consultation Responses

- 12.3.1 **Table 12.1** documents the points raised by SNH and RSPB in relation to ornithological aspects reported in the ES.

Table 12.1 Consultation Points Raised by SNH and RSPB in Relation to Ornithology

Consultee	Point raised	How it has been addressed
SNH	Advise that all ground or vegetation clearance should take place out-with the main breeding bird season (April to August inclusive). If this is not possible then a suitably qualified individual should be appointed to carry out a survey immediately prior to the works.	This will be adhered to, as specified in Section 12.11 of the ES.

Consultee	Point raised	How it has been addressed
SNH	<i>"We largely agree with the assessment of effects on other natural heritage interests and with the proposed suite of mitigation measures. We recommend that the full range of ecological mitigation and enhancement measures identified in the ES is implemented."</i>	The ornithological mitigation and enhancement measures detailed in Section 12.11 of the ES will be implemented in the event that the Proposed Development is constructed.
SNH	<i>Designated nature conservation sites. "We are satisfied that there is no connectivity between the proposed wind farm and the SPA/SSSI" (i.e. Muirkirk & North Lowther Uplands). "In our view it is unlikely that the proposal will have a significant effect on any qualifying interests either directly or indirectly. An appropriate assessment is therefore not required."</i>	Comments noted. Furthermore, the changes to the Proposed Development are likely to result in a reduction in the potential impacts discussed in ES Chapter 12 (none of which were significant). Any predicted effects will therefore either remain unchanged or potentially be reduced following the revision to the design of the Proposed Development.
RSPB	<i>Golden plover. "The development has the potential to negatively impact on non-breeding populations of golden plover. Golden plover are included on Annex 1 of the Council Directive 2009/147/EC (the 'Birds Directive') and as such afforded special conservation measures."</i>	<p>Impacts on golden plover are fully assessed in Chapter 12 of the ES, which concluded that no significant effects were likely in relation to this species. It was considered that small numbers of passage and overwintering birds may be displaced, though other suitable habitat is available outside of the area around the proposed turbine locations from which this species may be displaced, including within the Development Site.</p> <p>With the change in layout removing some of the northern and eastern-most turbines, more of the habitat utilised by non-breeding golden plover is outwith the potential displacement zone and therefore the impact of the Proposed Development in this respect is likely to be reduced.</p> <p>Golden plover collision risk is considered in Sections 12.8.13 – 12.8.19 of the ES, with modelling showing a theoretical collision rate of 4.4 birds per year, which would represent a negligible increase to the annual mortality rate of 0.018% based on the lowest estimate of the Scottish overwintering population (25,000 individuals). The reduction in the number of turbines, including removal from some areas of suitable golden plover habitat, is likely to slightly reduce the risk of golden plover collisions. Revised modelling, changing the number of turbines only (from 19 to 16), results in a predicted annual collision rate of 3.7, 0.7 individuals per annum less than predicted by the original modelling.</p>
RSPB	<i>Black grouse. "The development has the potential to negatively impact on black grouse. This is a species of conservation concern as it has suffered a dramatic decline across the UK and in South and West Scotland and is likely to have lost over 50% of its population since 1995."</i>	<p>All potential impacts considered within the ES in relation to this species were of low or negligible magnitude. The main black grouse lek location (maximum count of three males) is located to the east of the Development Site access track and ~300m east of the edge of the proposed Peat Hill borrow pit search area. The area around this lek site also appeared to be utilised by foraging and loafing black grouse and the location of the site infrastructure in the vicinity of this lek has not changed.</p> <p>No main leks are located within 1km of turbines, although there are occasional single lekking birds. Mitigation has been included for this species such that construction works are scheduled outside of the peak lekking periods (see Section 12.11.3 of the ES). The reduction in the number of turbines is likely to result in a slight reduction in any potential impact on this species, which were of no more than low magnitude, and significant effects therefore remain unlikely.</p>
RSPB	<p>Request a planning condition to secure:</p> <ul style="list-style-type: none"> ▶ The implementation of a programme of post-construction bird monitoring, to be agreed with SNH & RSPB, in order to validate the assumptions of the ES and FEI; ▶ The production and implementation of a Habitat Management Plan to mitigate the effects on peatland and enhance the habitat for black grouse and golden plover that will operate for the full lifespan of the Proposed Development and be delivered through a Section 75 obligation. 	E.ON confirm that they would accept conditions to implement a programme of on-site post construction bird monitoring and to implement a habitat management plan, both within the Development Site. This is considered to be a more appropriate mechanism than a Section 75 obligation.

12.4 Implications of Revised Layout

- 12.4.1 The Proposed Development has been revised from up to 19 turbines (illustrated in FEI **Figure 1.2**) to up to 16 turbines (illustrated in FEI **Figure 1.1**). The proposed turbine dimensions remain unchanged to those reported on in the ES, with a maximum turbine blade tip height of 130m and a maximum blade diameter of 106m.
- 12.4.2 The access route between the remaining 16 turbines and the road network remains largely unchanged, as does the location of two of the borrow pit search areas (the third search area reported in the ES having been deleted), temporary construction compound and substation. These are located in the north-western part of the site where the records of black grouse were concentrated. With no substantive change in layout in this part of the Development Site, the impacts are likely to remain as described in **Chapter 12** of the ES, i.e. no residual significant effects on birds are predicted as a result of the Proposed Development, or cumulatively or in combination with other developments.
- 12.4.3 The Revised Layout includes the removal of some turbines from the eastern and northern edge of the array. This may result in a slight reduction in potential impacts on golden plover, which have been recorded utilising Benty Cowan Hill, although all effects on this species assessed within the ES were non-significant.

12.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

Construction, Operational and Decommissioning Disturbance to Breeding and Wintering Birds

- 12.5.1 Species taken forward for assessment in **Chapter 12** of the ES were golden plover, black grouse and merlin.
- 12.5.2 For golden plover, there were no breeding territories on site, with small non-breeding flocks utilising the plateau areas on the Development Site. With the reduction in the number of turbines and deletion of turbines from the eastern edge of the array, the Proposed Development encroaches less onto Benty Cowan Hill, which is one of the areas utilised by this species.
- 12.5.3 In respect of black grouse, the core lek locations were located >500m from the nearest turbine and 300m from the nearest borrow pit search area and this remains the case. Mitigation for this species during the core lekking periods to avoid disturbance by construction activities is described in section 12.11 of the ES.
- 12.5.4 The single merlin nest recorded remains ~500m from the nearest proposed turbine and is therefore outwith the potential displacement distance. Mitigation was also included for this species: to undertake pre-construction surveys to identify any change of location to the nest site and implement measures to ensure that this species is not disturbed as a result of the construction works.
- 12.5.5 It is considered that the deletion of three of the turbines will result in a reduction in the area of suitable habitat that will potentially be lost to these species and, in the case of non-breeding golden plover, the Proposed Development will be more distant from one of the favoured areas at Benty Cowan Hill. Therefore the impact assessment presented in **Chapter 12** of the ES remains valid; and potentially the magnitude of the impacts will be slightly reduced.

Collision-Risk (Operational Effects)

- 12.5.6 Vantage point surveys undertaken across two breeding and three non-breeding seasons confirmed that the majority of flight activity within the Development Site by 'target species' (i.e. those potentially susceptible to collisions with turbines and of recognised conservation concern, as

detailed in SNH 2014 guidance) is low. Collision risk Analysis (CRA) presented in the ES was therefore limited to golden plover given the presence of relatively small groups of birds during the winter period that were recorded in flight within the area proposed for turbines (see **Appendix 12.G** of the ES for details of CRA). CRA was undertaken for the season with the highest number of golden plover flights (and is therefore likely to be a precautionary estimate) and predicted an annual collision rate of 4.4 birds. If this theoretical collision risk is considered in relation to background mortality for this species (27%)¹, the loss of 4.4 birds per year will represent a negligible increase to the annual mortality rate of 0.018% (**Appendix 12.G** of the ES) based on the lowest estimate of the Scottish overwintering population (25,000 individuals).

12.5.7 The reduction in the number of turbines from up to 19 to up to 16, including the deletion of turbines from the eastern edge of the array, is likely to result in a slight reduction in the risk of golden plover collisions, as there are fewer rotors, including in areas of suitability for this species. The proposed turbine dimensions remain unchanged. The CRA presented in the ES was updated, with the only change being the number of turbines reducing from 19 to 16, which yields a predicted annual collision rate of 3.7 individuals, 0.7 individuals per annum less than predicted based on the Original Layout. The updated CRA is presented in FEI **Appendix 12.A**. As such, it is considered that the proposed layout revisions will result in a slight reduction in the risk of collision.

12.5.8 The conclusion presented in Section 12.8.19 of the ES, that the effect of collision mortality on golden plover will be slight (i.e. the effect is not significant) remains valid.

12.6 Evaluation of Residual Effects

12.6.1 On consideration of the implications of the revisions to the Proposed Development design in respect of birds, the conclusions reached in the ES remain valid. No significant effects on birds are predicted as a result of constructing, operating or decommissioning the revised 16 turbine Proposed Development, either alone or in combination with other nearby built or consented schemes.

12.7 Conclusions

12.7.1 The conclusion in **Chapter 12** of ES remains valid and significant effects on birds as a result of the Proposed Development remain unlikely.

12.8 References

Enoch Hill Wind Farm Environmental Statement, Volume 1: Main Report. September 2015. Amec Foster Wheeler on behalf of E.ON.

SNH, 2006. Assessing significant of impacts from onshore wind farms on birds outwith designated areas.

SNH, 2014. Recommended bird survey methods to inform impact assessment.

¹ <http://www.bto.org/about-birds/birdfacts>. Accessed on 30 June 2015.

13. Geology, Hydrology and Hydrogeology

13.1 Introduction and Overview

- 13.1.1 This chapter presents the conclusions of the assessment as to the effects on geology, hydrology and hydrogeology during the construction, operation and decommissioning phases of the Revised Layout. It should be read with reference to the scheme description in FEI **Chapter 4 - Description of the Proposed Development**.
- 13.1.2 The assessment discusses only the conclusions and any changes to the assessment as a result of the Revised Layout. The Environmental Statement (ES) associated with that application should be referred to for the details of the assessment methodology, baseline conditions, comprehensive assessment of effects and details of all environmental measures. The assessment is only revisited here insofar as the Revised Layout of the Proposed Development alters the findings of the ES.
- 13.1.3 The key revisions to the Proposed Development with implications in respect to the geology, hydrology and hydrogeology include a reduction in the number of turbines (and associated infrastructure such as crane pads) from up to 19 to up to 16, with some moved from their previous locations by up to ~400 m; a reduction in the length of access tracks from ~12.9 km to ~12.07 km; a reduction in the number of watercourse crossings from six to five; and a reduction in the number of borrow pit search areas from three to two.

13.2 Changes to Policy and Legislative Context

- 13.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 13.2.2 Relevant changes to national planning policy, advice and guidance since the submission of the section 36 application are:
- ▶ Publication of a new version of *Good Practice During Wind Farm Construction* (Scottish Renewables / SNH / SEPA / Forestry Commission / Historic Scotland (2015)); and
 - ▶ Publication of the Carbon and Peatland Map 2016 (Scottish Natural Heritage, June 2016).
- 13.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
- ▶ Policy OP1: Overarching Policy;
 - ▶ Map 12: Spatial Framework for Wind Energy Development over 50m in height and supporting paragraphs 6.1.10 - 6.1.11;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height;
 - ▶ Schedule 1 – Renewable Energy Assessment Criteria;
 - ▶ Policy ENV6: Nature Conservation;
 - ▶ Policy ENV9: Trees, Woodland and Forestry;
 - ▶ Policy ENV10: Carbon Rich Soils;
 - ▶ Policy ENV11: Flood Prevention; and

- Policy ENV12: Water, Air and Light and Noise Pollution.

13.3 Application Consultation Responses

13.3.1 As part of the consultation process undertaken by the Scottish Government following submission of the section 36 application in September 2015, Marine Scotland (MS), the Scottish Environment Protection Agency (SEPA) and Galloway Fisheries Trust (GFT) provided consultation responses. The Applicant’s responses relating to hydrology, geology and hydrogeology are addressed in **Table 13.1**.

Table 13.1 Consultation Responses Relating to Hydrology, Geology and Hydrogeology

Consultation response	Response	Actions
<p>MS, regarding water quality data:</p> <p><i>“Insufficient water quality information (including turbidity and flow/stage data) is provided in the ES to characterise the watercourses within and downstream of the proposed development area and to assess the potential impacts of the development on the water quality”.</i></p> <p><i>“Furthermore no details regarding a water quality monitoring programme during and after construction are provided. We attach a document* prepared by MS outlining a full description of an integrated monitoring programme (water quality, macroinvertebrate and fish populations) which can be consulted in preparation of a site specific monitoring programme for the proposed development. The potential impact of adjacent wind farms should be considered in the design of the monitoring programme, particularly in the selection of the control sites. We recommend the existing water quality issues due to the presence of surface coal mining and acid rich waters resulting from forestry clearance, to be considered in the monitoring programme”.</i></p> <p>*Generic Monitoring Programme document</p>	<p>The water quality information provided in the ES was compliant with the original scoping response from MS (dated November 2012), and was sufficiently detailed to inform the impact assessment.</p>	<p>It is suggested that a monitoring programme at on-site locations and / or publically accessible off-site locations be secured by a planning condition if the Proposed Development is granted consent. This would be compatible with MS’s original scoping response request for a monitoring programme, and would also address the requirements of the GFT (see below). It is assumed that if secured by a planning condition, MS would be allowed an opportunity to comment on the details of the monitoring programme prior to its implementation.</p>
<p>GFT, regarding monitoring:</p> <p><i>“On behalf of the DDSFB we would like to have the opportunity to agree a pre-construction, during construction and post-construction monitoring programme, especially since some infrastructure does now lie within the watershed of the Dee catchment.”</i></p>	<p>This is in line with findings and recommendations of the ES, which specify that a CEMP would be put in place for the whole period of construction, setting out any specific environmental management requirements such as ECoW requirements for aquatic monitoring and protection measures, pollution control and contingency procedures.</p>	<p>As above, it is suggested that CEMP requirements for aquatic monitoring be secured by a planning condition if the Proposed Development is granted consent. It is assumed that if secured by a planning condition, GFT would be allowed an opportunity to comment on the details of the monitoring programme prior to its implementation.</p>

Consultation response	Response	Actions
<p>GFT, regarding watercourse buffer zones:</p> <p><i>"It is appreciated that a buffer zone of 50 m will be applied around all tributaries and watercourses in the area but we suggest that this is an absolute minimum. Due to the likely occurrence of adverse weather episodes during the excavation of turbine bases 6, 7 and 19, and their corresponding access roads, combined with the nature of the gradient in the area, it is very likely that silt and/or pollution will run downhill to watercourses. Therefore we request that the turbines 6, 7 and 19 are re-positioned with a buffer of 100 m to the nearest watercourse in addition to putting in place adequate mitigation measures to ensure no silt or pollution is allowed to enter any watercourse in the Dee catchment"</i>.</p>	<p>Mitigation, as described in Section 13.10 of the ES, will be implemented to manage the type of effect that GFT mentions and, in conjunction with the buffer zones, avoid significant effects on downslope watercourses.</p> <p>Whilst a minimum 50 m buffer was applied to the Dee catchment watercourses, all three turbine bases (now numbered 6, 7 and 16) and their access roads lie 100 m or more away from any watercourses (their revised locations have not changed significantly).</p> <p>A 100 m dashed line buffer has been added to the relevant watercourses in FEI Figure 13.1, for clarity.</p>	<p>n/a</p>
<p>SEPA summarises the findings of the Groundwater Dependent Terrestrial Ecosystem (GWDTE) assessment in ES Chapter 13. In SEPA's opinion the direct impacts on the three habitats Amec Foster Wheeler identified as being groundwater dependent will be adequately mitigated by the measures presented in Table 4.1 of the GWDTE assessment, within Appendix 13.B of the ES.</p>	<p>The ES reflects SEPA's conclusions.</p>	<p>Mitigation measures relating to GWDTEs, as specified in the ES, are to be incorporated into the Construction Environmental Management Plan (CEMP).</p>
<p>SEPA is in agreement with the findings of the ES that any Private Water Supplies (PWS) in the area are outwith the buffer zones specified within SEPA's guidance, and therefore would not be impacted by the Proposed Development.</p> <p>The ES identifies that a monitoring programme would be undertaken at the PWS which supplies Craighouse Cottage to assess 'worst case' effects on its Zone of Contribution (ZOC), and SEPA welcomes this commitment.</p>	<p>SEPA's opinion with respect to the risk to PWS concurs with the findings presented in the ES.</p>	<p>Mitigation measures relating to PWS, as specified in the ES, are to be incorporated into the CEMP.</p> <p>Monitoring in the general vicinity of Craighouse Cottage PWS source would be undertaken at a surrogate spring or surrogate borehole installed by the Applicant, such that samples collected would be at a frequency and assessed for a suite of parameters compliant with Appendix 5 of SEPA's Land Use Planning System Guidance Note 31 (LUPSGU31).</p>

13.4 Implications of Revised Layout

Potential Receptors

- 13.4.1 Potential receptors were listed in Table 13.11 of the ES. The Revised Layout does not result in any changes to the potential receptors from those identified in the ES. Potential receptors and associated hydrological constraints are shown with the Revised Layout in FEI **Figure 13.1**.
- 13.4.2 Where turbines have moved from the locations assessed in the ES, they have not moved outside the boundaries of the previously identified surface watercourse catchments. T14 now lies on the catchment divide between Trough Burn and Polga Burn, but as both watercourses have other proposed turbines within their catchment areas, they were previously considered as potential receptors in the ES, and remain so here. The three turbines that have been removed from the Proposed Development were located in the catchments of Knockburnie Burn (one turbine) and Polga Burn (two turbines), both of which still have other turbines within their catchment, and hence will still be considered as potential receptors.

- 13.4.3 There are no changes arising as a result of the Revised Layout that affect the conclusions of the ES and the assessment regarding potential PWS receptors.
- 13.4.4 There are also no changes arising as a result of the Revised Layout that affect the conclusions of the ES and the assessment regarding potential GWDTE receptors.
- 13.4.5 Other receptors listed in Table 13.11 of the ES were the River Nith SSSI, aquifers and peat hydrology. These remain relevant with the Revised Layout.

Potentially Significant Effects

- 13.4.6 The following types of potentially (prior to mitigation) significant effect of the Proposed Development upon water environment interests were identified in Section 13.6 of the ES:
- ▶ Potential adverse effects on drainage patterns, surface water flows, aquifer recharge, PWS yield, GWDTEs and/or peat hydrology, principally in relation to increased runoff and dewatering associated with access track, turbine foundation and borrow pit construction; and
 - ▶ Potential pollution to watercourses, underlying aquifers, PWSs, GWDTEs and/or peat hydrology through increased suspended sediment release on or adjacent to the Development Site from runoff associated with construction activities, accidental spillage from site activities and/or concrete leaching associated with turbine foundations.
- 13.4.7 The Revised Layout does not result in any changes to these potentially significant effects.

13.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

- 13.5.1 Sections 13.7-13.9 of Chapter 12 of the ES discussed the potential effects at each phase of the development. This section provides a summary across all phases, taking account of the Revised Layout.

Surface Water Courses (Flows and Quality)

- 13.5.2 The Proposed Development has been designed to avoid the buffer areas applied to surface watercourses. In line with the ES, a 100 m buffer was set for watercourses in the River Nith catchment, and a 50 m buffer for watercourses in the Water of Deugh catchment. Furthermore, with the exception of T2 and T5, all turbines are located at least 100 m from watercourses.
- 13.5.3 The 100 m buffer for watercourses in the River Nith catchment was set on a precautionary basis due to the presence of sensitive salmonid populations in the catchment. Subsequently, electrofishing surveys have been carried out on watercourses around the site. The report on those surveys is presented in ES **Appendix 11.G**. In many cases the surveys confirmed the presence of salmonid populations, but it was concluded that *“The Little Chang, Catlock and the un-named tributary of the Little Chang do not contain suitable habitat for fish to inhabit”* (ES **Appendix 11.G**). As a result, the application of a more standard 50 m buffer to those watercourses is considered suitable, and is shown as a dashed line on FEI **Figure 13.1**. Turbines T2 and T5 are located outside this 50 m buffer.
- 13.5.4 The revised track layout has followed the same routes, but as mentioned earlier, the total length of track is reduced from ~12.9 km to ~12.07 km, and the number of watercourse crossings has reduced from six to five. The southernmost borrow pit search area has been removed from the Revised Layout. Overall the reduced number of turbines, the removal of one planned borrow pit, the reduced number of watercourse crossings and the reduced length of track contribute to an overall reduction in the probability of an effect on the River Nith catchment occurring, particularly to the Knockburnie Burn and Polga Burn.

- 13.5.5 The revisions to the layout do not alter the conclusions of the ES with respect to surface water flows. The level of effect on all receptors, for all phases of development, is concluded to remain as **not significant**.
- 13.5.6 The revisions to the layout also do not alter the conclusions of the ES with respect to surface water quality. Without mitigation, the potential magnitude of change from sediment loading and pollution during construction (and potentially decommissioning) would be medium. With respect to the medium sensitivity Water of Deugh catchment tributaries, this is equivalent to a moderate and **not significant** potential effect. For the high sensitivity River Nith tributaries and the associated Nith Bridge SSSI, the level of potential effect associated with the construction phase is substantial and **significant**, and so requires mitigation as detailed in the ES (i.e. Implementation of a Drainage Management Plan (DMP) and a Pollution Prevention Plan (PPP); No direct discharge of water to natural channels; use and regular clearing of sediment removal methods; prompt re-stabilisation of disturbed areas; Construction activity / storage / traffic routes to take place in clearly defined working areas; and Designated areas for refuelling, maintenance and washing of vehicles / plant). For subsequent phases of the development, the conclusions remain consistent with the ES: **not significant**.

Groundwater Body (Flows and Quality)

- 13.5.7 The reduction in turbines from up to 19 to up to 16, with the associated reduction in track length and removal of one borrow pit search area, results in a reduction to the overall probability of a significant effect on groundwater occurring. However, the potential effects for both groundwater flows and quality were, in any case, expected to be very limited in extent for all phases of the development and **not significant**. The revisions to the layout do not result in any changes to those conclusions.

Private Water Supplies

- 13.5.8 The ES identified only one PWS, Craighouse Cottage, with any potential for effect. There have been no changes to the layout that would alter the potential for effect, and hence the conclusions remain the same for all phases of the development: **not significant**.

GWDTes

- 13.5.9 The GWDTE assessment in the ES (ES **Appendix 13.B**) identified three 'true' GWDTEs. The 'true' GWDTEs are shown in FEI **Figure 13.1** along with a 100 m and 250 m buffer and the ZoC associated with each. The assessment for each GWDTE has been revisited in light of the Revised Layout:
- ▶ GWDTE 14, lying to the west of Benty Cowan Hill. Although still within 250 m, T14 has moved slightly further away from the GWDTE and now lies just to the south of the divide between Trough Burn and Polga Burn, hence lying outside the ZoC of the GWDTE. The potential for effect on this GWDTE for all phases of the development remains **not significant**;
 - ▶ GWDTE 207 lies next to the road in the northwest corner of the Development Site. There are no revisions to the layout in this area, hence the conclusions remain unchanged. The potential for effect on this GWDTE for all phases of the development remains **not significant**;
 - ▶ GWDTE 208 lies in between Knockburnie Burn and Littlechang Burn. In the Original Layout, this GWDTE lay between two proposed borrow pit search areas, both of which extended to within the 250 m buffer around the GWDTE. The most southern of these borrow pit search areas has now been removed from the Revised Layout. Although effects from the borrow pits were assessed to be not significant, the ES did identify the potential for non-significant effects on groundwater flow, and the removal of the southernmost borrow pit will reduce the risk of an effect on the GWDTE.
- 13.5.10 The location of T2 has been moved slightly further north than in the Original Layout, and now lies within the 250 m buffer around GWDTE 208, but outwith the 100 m buffer. However, the revised

location of T2 remains outside the ZoC of the GWDTE. As a result, the potential magnitude of change (relating to flow and water quality) is expected to be low which, taken alongside the very low sensitivity of the receptor, leads to an overall negligible level of effect that is **not significant** for all phases of the development.

Peat Hydrology

- 13.5.11 Some further peat surveys have been carried out since the ES was submitted (with the refined mapping of areas of peat greater than 1 m depth shown in FEI **Figure 13.1** and the full results reported in the updated Peat Slide Risk Assessment (FEI **Appendix 6.B**), but they have not significantly altered the baseline understanding of peat hydrology across the site.
- 13.5.12 The Revised Layout has been designed to minimise peat excavation from tracks and turbine infrastructure. Therefore there are no changes to the conclusions of the ES that potential disruption to the peat hydrology would be **not significant** for all phases of the development.

13.6 Evaluation of Residual Effects

- 13.6.1 Based on the provision of all mitigation measures discussed in the ES Section 13.10 (refer also to the summary of mitigation measures proposed in ES Table 13.12), the conclusions regarding residual effects remain the same as presented in the ES. Although two turbines (T2 and T5) lie within the precautionary 100 m buffer originally assigned across the whole of the River Nith catchment, the improved baseline fisheries knowledge for the nearby watercourses (Catlock Burn and Littlechang Burn) demonstrate that they are of lower sensitivity due to the lack of salmonid habitat and, while downstream watercourses do contain salmonid populations, the measures that will be put in place provide an appropriate level of protection alongside a 50 m buffer. On this basis the potential magnitude of change with respect to water quality is reduced to low, leading to a moderate level of residual effect that is **not significant**. Residual effects for all relevant receptors during all phases of Proposed Development are therefore concluded to be **not significant**.

13.7 Conclusions

- 13.7.1 The Revised Layout of the Proposed Development, comprising up to 16 turbines, has been assessed with regard to hydrology, geology and hydrogeology. The reduced number of turbines and borrow pit search areas, and associated reduction in overall track length, reduces the overall potential for effects to occur. Overall, there is no change to the conclusions from the ES, with all residual effects concluded to be **not significant**.

13.8 References

- 13.8.1 Refer to **Chapter 13** of the ES.

14. Traffic and Transport

14.1 Introduction and Overview

- 14.1.1 This chapter assesses the potential Traffic and Transport related effects associated with the Revised Layout. It should be read with reference to the scheme description in **Chapter 4 - Description of the Proposed Development and ES Chapter 14 - Traffic and Transport**.
- 14.1.2 In summary, the revisions to the Proposed Development will see a reduction in the number of wind turbines from 19 to 16 and thus a commensurate reduction in the associated accommodation works. As a result, the level of traffic generated during the construction phase of the Proposed Development would be reduced and as a result the impact on the surrounding highway network and its users would also be reduced.

14.2 Changes to Policy and Legislative Context

- 14.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 14.2.2 At the national level the only relevant change is that a new version of *Good Practice During Wind Farm Construction* (Scottish Renewables / SNH / SEPA / Forestry Commission / Historic Scotland) was published in September 2015.
- 14.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
- ▶ Policy OP1: Overarching Policy;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height;
 - ▶ Schedule 1 – Renewable Energy Assessment Criteria; and
 - ▶ Policy T1: Transportation requirements for new development.

14.3 Application Consultation Responses

- 14.3.1 Table 14.1 sets out the consultation responses received from the statutory consultees in response to the section 36 application.

Table 14.1 Consultation Points Raised in Relation to Traffic and Transport

Consultation response	FEI Response	Actions
<p>East Ayrshire Council (EAC)</p> <p>EAC raised no objections to the application, but requested the following: should consent for the Development be granted:</p>	<p>E.ON does not agree with the need to enter into a section 69 agreement. Extraordinary damage can be addressed through section 96 of the Roads Act 1984 and the Applicant does agree to a bond being lodged with EAC to pay for repair of any extraordinary road damage / road damage from abnormal loads.</p>	<p>E.ON would agree a mechanism with EAC to pay for any extraordinary road damage / road damage from abnormal loads.</p>

Consultation response	FEI Response	Actions
<ul style="list-style-type: none"> ▶ <i>“Section 69 agreement for: Stone moved on the B741 within EAC’s and South Ayrshire Council’s (SAC) remit;</i> ▶ <i>Section 69 agreement for: Stone moved on the B741, B743 & B713 in Ayrshire Road Alliance’s (ARA) remit (a £1 per ton contribution to cover the extraordinary impact on road maintenance is suggested);</i> ▶ <i>Concrete sourced off site should be included within the Section 69 agreement;</i> ▶ <i>The Section 69 agreement should include appointment of an independent auditor who would report to EAC; and</i> ▶ <i>A section 56 road opening permit would be required for the access point onto the B741”.</i> 		
<p>Dumfries and Galloway Council (DGC)</p> <p>DGC raised no objections to the application, stating the following:</p> <p><i>“No recommendations as the windfarm is located entirely within East Ayrshire with all abnormal loads and general construction traffic utilising roads within Ayrshire. Any proposed route changes by the developer should be discussed with Dumfries and Galloway Council but currently no action will be taken”.</i></p>	N/A	N/A
<p>Transport Scotland</p> <p>Transport Scotland raised no objections to the section 36 application but requested the following be conditioned:</p> <ul style="list-style-type: none"> ▶ <i>“Prior to commencement of deliveries to site, the proposed route for any abnormal loads on the trunk road network must be approved by the trunk roads authority prior to the movement of any abnormal load. Any accommodation measures required including the removal of street furniture, junction widening, traffic management must similarly be approved”;</i> and 	E.ON can confirm that it would accept in principle these suggested conditions.	N/A

Consultation response	FEI Response	Actions
<p>► <i>“During the delivery period of the wind turbine construction materials any additional signing or temporary traffic control measures deemed necessary due to the size or length of any loads being delivered or removed must be undertaken by a recognised QA traffic management consultant, to be approved by Transport Scotland before delivery commences”.</i></p>		

14.4 Implications of Revised Layout

Traffic Flows

- 14.4.1 The traffic flow data presented in the ES, which was obtained from Automatic Traffic Counters (ATCs) and the Department for Transport’s (DfT’s) online database, has been extracted for use within this chapter.
- 14.4.2 The DfT data is available for all ‘A’ classified highways throughout the UK and is presented as Annual Average Daily Traffic flows (AADT) for the latest 10 year period. The traffic counts are fully classified into different classes of vehicle and therefore a Heavy Goods Vehicle (HGV) percentage has also been derived.
- 14.4.3 As per the assessment presented in the ES, only data for the ‘Quarry route’¹ has been obtained since the vehicle movements associated with turbine component delivery will be relatively few in number and therefore scoped out of detailed assessment. Furthermore, the movement of turbine components is heavily controlled and that the management measures applied as standard, minimises the environmental effects on sensitive receptors
- 14.4.4 **Table 14.2** provides a summary of the data obtained from the DfT count points and ATC flows.

Table 14.2 Traffic Flow Summary

Route No	AADF 2013 (24 hour)	HGV (24 hour)	07:00 – 19:00 Total Traffic	07:00 – 19:00 HGV	07:00 – 19:00 HGV %
B743	1,193	80	998	74	7%
B705	4,130	77	3,312	68	2%
B741	795	27	653	26	4%
A76*	6,420**	912	5,059	719	14%

*12 hour flows derived from Table TRA0307 provided by the DfT.

**Data was recorded in 2014.

¹ The route from the quarry to the Development Site as shown on **Figure 14.1** of the ES is expected to follow the B743, travelling westbound before joining the B713 in the village of Sorn, and continuing through the village of Catrine before joining the A76. From the A76 the route heads south and travels through New Cumnock, where it then joins the B741 heading south-west towards the Site access off this road.

14.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

Construction Effects

- 14.5.1 A review of the revised construction traffic has been undertaken and compared with the flows generated by the original proposal.
- 14.5.2 **Table 14.3** sets out the estimated traffic generated as a result of the layout design presented in the ES and as a result of the proposed revisions to the layout.

Table 14.3 Estimated Traffic Generated As a Result of the Layout Design Presented in the ES and as a Result of the Proposed Revisions to the Layout

Activity	Original Layout		Revised Layout	
	Total loads	Total trips (two way)	Total loads	Total trips (two way)
Delivery of plant and equipment	30	60	30	60
Road stone for Enabling Tracks and Compounds	4,990	9,980	4,188	8,376
Culvert and Bridge Materials	5	10	5	10
Stone for Crane Pads	1,328	2,656	1,124	2,248
Concrete for Control Building compound and HV Plinths	60	120	60	120
Geogrid	15	30	15	30
Delivery of Road Stone for Construction Compound	450	900	450	900
Delivery of Backfill Stone for Turbines	1,197	2,394	1,008	2,016
Delivery of Road Stone for Substation*	891	1,782	891	1,782
Delivery of Compound General Equipment	37	74	37	74
Delivery of Electrical Equipment	60	120	60	120
Cabling	10	20	8	16
Sand	124	248	102	204
Turbine Bases (concrete)	2,375	4,750	2,000	4,000
External Transformers	7	14	6	12
Reinforcing Steel + Shuttering	73	146	61	122
Base Rings	7	14	6	12
Concrete for WTG Transformer foundations (ext.)	29	58	24	48
Delivery of Met Mast concrete	5	10	5	10
Delivery of Met Mast equipment	8	16	8	16
Crane Delivery and Removal	15	30	15	30
Delivery of HV Plinth Concrete	63	126	63	126
Delivery of Turbines (abnormal loads only on delivery)	190	380	160	320
Removal of Plant and equipment	30	60	30	60
Total	11,999	23,998	10,359	20,718
Total without delivery of turbines	11,809	23,618	10,199	20,398

*Includes the delivery of road stone for control building compound.

14.5.3 **Table 14.4** shows the reductions in traffic generation as a result of the Revised Layout.

Table 14.4 Difference Between Traffic Generation Resulting from the Original Layout and the Revised Layout

Activity	Total loads	Total trips (two way)
Delivery of plant and equipment	0	0
Road stone for Enabling Tracks and Compounds	-802	-1604
Culvert and Bridge Materials	0	0
Stone for Crane Pads	-204	-408
Concrete for Control Building compound and HV Plinths	0	0
Geogrid	0	0
Delivery of Road Stone for Construction Compound	0	0
Delivery of Backfill Stone for Turbines	-189	-378
Delivery of Road Stone for Substation*	0	0
Delivery of Compound General Equipment	0	0
Delivery of Electrical Equipment	0	0
Cabling	-2	-4
Sand	-22	-44
Turbine Bases (concrete)	-375	-750
External Transformers	-1	-2
Reinforcing Steel + Shuttering	-12	-24
Base Rings	-1	-2
Concrete for WTG Transformer foundations (ext.)	-5	-10
Delivery of Met Mast concrete	0	0
Delivery of Met Mast equipment	0	0
Crane Delivery and Removal	0	0
Delivery of HV Plinth Concrete	0	0
Delivery of Turbines (abnormal loads only on delivery)	-30	-60
Removal of Plant and equipment	0	0
Total	-1,640	-3,280
Total without delivery of turbines	-1,610	-3,220

14.5.4 As can be seen from Table 14.3, the Proposed Development generates 3,220 less two-way vehicle movements and as such the impact on the local highway network and its users has been reduced by approximately 16%.

14.5.5 Traffic generation is spread over the entirety of the construction programme and the revised traffic movements over the anticipated 12 month programme are presented in **Table 14.5**.

Table 14.5 Monthly Traffic Movements over Construction Programme

Activity	Month												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Delivery of compound general equipment		37											37
Delivery of plant and equipment	60												60
Road stone for enabling tracks and compounds	2319	2319	2319	2319									9276
Culvert and bridge materials	5	5											10
Stone for crane pads		562	562	562	562								2248
Delivery of roadstone for substation	891	891											1782
Concrete for control building compound and HV plinths		123	123										246
Geogrid	10	10	10										30
Delivery of control building equipment							30	30					60
Delivery of substation electrical equipment							30	30					60
Cabling							8	8					16
Sand						102	102						204
Turbine bases (concrete)			800	800	800	800	800						4000
External transformers					3	3	3	3					12
Reinforcing steel and shuttering				32	30	30	30						122
Base rings				3	3	3	3						12
Concrete for turbine transformer foundations (ext.)					12	12	12	12					48
Delivery of met mast concrete					10								10

Activity	Month												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Delivery of met mast equipment						16							16
Crane delivery							15						15
WTG Backfill						672	672	672					2016
Delivery of turbines (abnormal loads only on delivery)									160	160			320
Crane removal											15		15
Removal of plant and compound equipment											37	60	97
Total without deliveries of concrete for turbine bases	3285	3947	3014	2916	620	838	905	755	160	160	52	60	16712
Total with delivery of concrete for turbine bases	3285	3947	3814	3716	1420	1638	1705	755	160	160	52	60	20712
Movements/day (average, assuming 22 working days/mth)*	150	180	174	169	65	75	78	35	8	8	3	3	948
Movements/hr (average 12hr day)*	13	15	15	15	6	7	7	3	1	1	1	1	85

*Including delivery of concrete for turbine bases and rounded up to the nearest number

14.5.6 Month two in the construction programme generates the highest number of trips (3,947) with a total of 180 movements per day or 15 per hour across a 12 hour working day (Mon-Fri 0700-1900). The figures for month two can be considered a worst-case scenario and contrast with the equivalent figure presented in the ES for the Original Layout. These would be 4,467 trips with a total of 204 movements per day for month three. The impacts on assessed receptors (i.e. schools, community facilities, shops etc.) from the Revised Layout in terms of: severance; driver delay; pedestrian delay; pedestrian amenity; fear and intimidation; and accidents and safety would be of a short duration, and as they are lower than those for the Original Layout, the effects would remain not significant.

Operational Effects

14.5.7 Effects associated with the operation of the Proposed Development will remain as not significant since the number of regular trips to the Development Site will be limited to monthly inspections carried out in a 4x4 off road vehicle as detailed in ES **Chapter 14**.

Decommissioning Effects

- 14.5.8 The magnitude of any change during decommissioning is likely to be less than during construction, particularly against a background of increasing baseline traffic flows in the future.
- 14.5.9 As part of the decommissioning of the Development, all turbine components (towers, nacelle, hub, blades and electrical kiosk) will be broken down on site and removed using standard HGV vehicles, negating the need for any future abnormal loads. Concrete bases will be broken down to below ground level and covered, all cables will be cut to ground level and left underground and all access tracks will remain in situ.
- 14.5.10 As a result of this approach to the decommissioning phase the level of traffic will be significantly lower than during construction. Furthermore, with the implementation of an appropriate Traffic Management Plan (TMP), which will be approved by EAC prior to construction, significant effects are not anticipated. A separate assessment of effects could be conducted nearer the time should there be any concerns in respect of decommissioning.

Cumulative Effects

- 14.5.11 A review of the locations for each of the cumulative developments has been undertaken, alongside a review of any supporting documents (e.g. application documents from local authority and developer websites).
- 14.5.12 In the case of this assessment it has been considered appropriate to take account of consented wind farms located within a 30km radius of the Development Site. A summary of each of the schemes is presented within **Table 14.6** and is based on an update of the cumulative baseline which was undertaken in August 2016. Whether or not a cumulative effect will arise depends on the outcome and timing of the construction of the schemes considered, and on which supplier they source their construction material from, which will influence their proposed construction route(s).
- 14.5.13 As insufficient information is known about some schemes and their construction programme, it is possible that the traffic routes and programme could overlap; and therefore it is possible that there could be cumulative effects. For those schemes where the number of turbines is low i.e. less than five, or where construction is currently underway or commencement of construction is imminent and is therefore likely to finish prior to the Proposed Development commencing, cumulative effects with the Proposed Development are unlikely.

Table 14.6 Summary of Cumulative Assessment

Scheme	No. of Turbines	Access from	Status/Anticipated Impact	Potential cumulative impact with Proposed Development
Pencloe	19	Afton Road	Being determined.	The developers of the Proposed Development are undertaking discussions with the developers of Pencloe Wind Farm and, in the unlikely event of the construction work overlapping, have agreed to work together to mitigate potential cumulative effects as far as possible.
Windy Standard Extension	30	Unknown	Consented.	Possibly
Afton	27	A76	Afton Wind Farm is due to start construction at the end of 2016 and as such, construction is unlikely to overlap with the Proposed Development.	No
Hare Hill Extension	39	A76	Constructed.	No

Scheme	No. of Turbines	Access from	Status/Anticipated Impact	Potential cumulative impact with Proposed Development
Mansfield Mains	1	Mansfield Road (accessed from the A76)	Approved in 2011, but no details on whether construction works have commenced.	Unlikely given the proposal is for a single turbine and even if construction coincides, cumulative impact is unlikely to be significant.
Sanquhar	12	A76	Consented, not in development. There are no details available of the construction programme, although it is understood that construction is likely to start imminently.	Unlikely
Dersalloch	23	B7045	Access to the site is via the B7045, to the south of the Development Site. No construction traffic associated with Dersalloch Wind Farm is expected to use the highways being considered within the Proposed Development assessment. Furthermore, Dersalloch Wind Farm is now under construction and as such will not overlap with construction of the Proposed Development.	No
Whiteside Hill	11	A76 via Blackaddie Road, Sanquhar	Consented wind farm transferred to Blue Energy effective from 29 th May 2015. Not in construction phase but developer website states construction will start in 2015 and be completed by 2017.	Unlikely
Torrs Hill	2	Likely to be the A713	No accompanying report supporting the consented scheme has been identified. However, given the size of the scheme, it is anticipated that the traffic generated during construction would not result in significant cumulative effects.	No
Sunnyside	2	Unknown	Operational.	No
Penbreck	6	Unknown	No accompanying report supporting the consented scheme has been identified. However, it is anticipated that the traffic generated during construction is not likely to result in significant cumulative effects.	Unlikely
Twentyshilling Hill	9	A76	Operational.	No
Knockman Hill	5	A702	Access to the site is via the A702, which routes in the opposing direction to the Proposed Development. No construction traffic associated with Knockman Hill Wind Farm is expected to use the highways being considered within the assessment for the Proposed Development.	No
Blackcraig Hill	23	A75	Under construction and due for completion in 2017. Access to the site is via the A75, which routes further to the south than the Proposed Development. No construction traffic associated with Blackcraig Hill Wind Farm is expected to use the highways being considered within the assessment for the Proposed Development.	No

Scheme	No. of Turbines	Access from	Status/Anticipated Impact	Potential cumulative impact with Proposed Development
Galawhistle	22	M74, J11	Under construction. No construction traffic associated with Galawhistle Wind Farm is expected to use the highways being considered within the assessment for the Proposed Development.	No

14.5.14 While there is some uncertainty as to the construction programme/routes of some of these schemes, in the event of an overlap in construction activities with construction vehicles using the same routes, the Applicant would ensure that vehicle movements would be coordinated to reduce effects. This would be aimed at minimising the adverse environmental effects associated with traffic and transport during construction.

14.5.15 On this basis, cumulative effects of construction traffic are unlikely to be significant.

14.6 Evaluation of Residual Effects

14.6.1 Residual effects are limited to the construction phase of the Proposed Development only since the magnitude of any change during decommissioning is likely to be less than during construction, particularly against a background of increasing baseline traffic flows in the future. All residual effects are assessed to be negligible and thus not significant. **Table 14.7** sets out a summary of the residual effects.

Table 14.7 Summary of Residual Effects

Potential Receptor and Effect	Effect	Significance	Summary Rationale
Severance	No Effect	NS	The ES concluded that significant effects were unlikely. As the revised development results in a marked reduction in traffic, effects associated with the revised Proposed Development remain 'not significant'.
Driver Delay	No Effect	NS	
Pedestrian Delay	No Effect	NS	
Pedestrian Amenity	No effect	NS	
Fear and Intimidation	No Effect	NS	
Accidents and Safety	No Effect	NS	
Key/ Footnotes:	No Effect Negligible Slight Slight/Moderate Moderate Moderate/ Substantial Substantial Very Substantial	S = Significant NS = Not Significant	

14.7 Conclusions

- 14.7.1 The revisions to the layout of the Proposed Development will markedly reduce the level of traffic generated during the construction of the Proposed Development. No significant environmental effects were identified for the previous layout of the Proposed Development; therefore effects associated with the Revised Layout remain not significant.

14.8 References

- 14.8.1 Refer to **Chapter 14** of the ES.

15. Socio-economics, Tourism and Recreation

15.1 Introduction and Overview

- 15.1.1 This chapter provides an update to ES **Chapter 15 – Socioeconomics, Tourism and Recreation** and therefore describes the likely significant socio-economic impact of the Revised Layout of the Proposed Development. The assessment considers the potential socio-economic effects of a wind farm consisting of up to 16 turbines being built at the Development Site. This is a reduction of 3 turbines compared with the Original Layout in the section 36 application submission. The maximum electrical power output per turbine has increased from the up to 3.3 megawatt (MW) originally proposed to up to 3.4MW, giving a revised proposed installed maximum generating capacity of up to 54.4MW (previously up to 62.7MW).
- 15.1.2 As detailed below and within **Chapter 15** of the ES, the Proposed Development may result in socio-economic effects at the regional level, for example, in relation to economic development, and also at the district/local level, principally affecting those who live in or visit the surrounding area. The potential effects resulting from the construction, operation and decommissioning of the Proposed Development considered in this chapter are:
- ▶ Direct effects on economic activity (e.g. business rates payable by the wind farm operator);
 - ▶ Indirect and induced effects on economic activity at a regional and local level (e.g. supply chain, multiplier effects, economic stimulus generated from the expenditure of additional employment income);
 - ▶ Direct effects on employment levels (e.g. construction workers);
 - ▶ Direct effects on land use within the Development Site (e.g. loss of agricultural land); and
 - ▶ Indirect effects on recreational use and tourism related business.
- 15.1.3 It is also pertinent to note from a socio-economic context that the Proposed Development would make a contribution to the alleviation of the adverse consequences of global warming by providing a renewable source of energy that, unlike electricity generation from fossil fuels, does not involve the emission of greenhouse gases during generation. For the purpose of this assessment, the amount of renewable electricity generation and total level of emissions avoided are considered to be beneficial.

15.2 Changes to Policy and Legislative Context

- 15.2.1 FEI **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 15.2.2 At the national level, the only changes specifically of relevance to this Chapter are the publication of the following non-statutory national planning policy documents:
- ▶ Scottish Government's Chief Planner letter regarding Energy Targets and Scottish Planning Policy (November 2015); and
 - ▶ Scottish Government Draft Advice on Net Economic Benefit and Planning (March 2016).
- 15.2.3 The Chief Planner's letter (November 2015) reiterates that net economic impacts, such as employment, associated business and supply chain opportunities, are material considerations in the determination of applications for renewable energy developments including onshore wind and states "*It is our expectation that such considerations are addressed in the determination of applications for renewable energy technologies*". Following on from the Chief Planner's letter, the Draft Advice (March 2016) aims to further the consideration of net-economic benefits as a material

planning consideration through capturing “*in a meaningful way the contribution of development proposals to the economy, while also recognising the potential impacts*”. The advice highlights the importance of assessing additionality¹ and therefore provides guidance regarding deadweight², displacement and inflation effects which should be considered when converting predicted gross economic impacts into net economic impacts.

15.2.4 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:

- ▶ Paragraph 2.13 – Rural Area Vision Statement;
- ▶ Policy OP1: Overarching Policy;
- ▶ Policy RE3: Wind energy proposals over 50 metres in height;
- ▶ Schedule 1 – Renewable Energy Assessment Criteria;
- ▶ Policy T4: Development and Protection of Core Paths and Natural Routes; and
- ▶ Policy TOUR4: The Dark Sky Park.

15.3 Baseline Review

15.3.1 The baseline socio-economic, tourism, recreational and land use characteristics of the Development Site and relevant Study Areas was outlined in Section 15.3 of ES **Chapter 15 - Socioeconomics, Tourism and Recreation**. Given that the Study Area remains unchanged and owing to the limited period of time which has elapsed since the submission of the section 36 application, combined with the lack of any known socio-economic changes to relevant geographies within this period, it is not considered necessary to provide an updated baseline, although further information has been provided in respect of Core Paths and Public Rights of Way (PRoW) as outlined below.

15.3.2 Following the ES consultation responses received from Scotways and East Ayrshire Council's Countryside Access Officer (see section 15.4 below) all PRoW located within 5km of the proposed turbines have been identified. A review of Core Paths located within the same area (previously identified as recreational receptors within Chapter 15 of the ES) has also been undertaken to confirm that all relevant Core Paths have been identified and to ensure that, taking account of the proposed design changes, these Core Paths remain relevant recreational receptors for consideration in this Chapter.

15.3.3 As shown on FEI **Figure 9.21**, the following Core Paths and PRoW within 5km of proposed turbines have been identified as relevant receptors:

- ▶ DGC Core Path No. 667: Water of Deugh Trail (assessed as a receptor in ES **Table 15.16**);
- ▶ EAC Core Path No. C12: New Cumnock Circular (assessed as a receptor in ES **Table 15.16**); and,

¹ This is the property of an activity being additional. It is a determination of whether an intervention has an effect, when the intervention is compared to a baseline. 'Interventions' can take a variety of forms, but often include economic incentives.

² This is a loss of economic efficiency that can occur when equilibrium for a good or service is not achieved or is not achievable.

- ▶ Six no. PRoW (identified as ‘a-f’ on FEI **Figure 9.21**) including one routed partially within the Development Site (all new receptors not previously assessed).
- 15.3.4 For the reasons noted in FEI **Chapter 9 - LVIA**, EAC Core Path No. C10: Coalfield Cycle Route and EAC Core Path No. C14: Glen Afton (both shown on **FEI Figure 9.21**) have been excluded from the assessment.
- 15.3.5 In relation to Heritage Paths and Scottish Hill Tracks, there is no change to the baseline reported in **section 15.7** of the ES.

15.4 Application Consultation Responses

15.4.1 **Table 15.1** summarises points of relevance to socio-economic, tourism and recreation issues received from consultees in respect of the ES, and also provides the Applicant’s response.

Table 15.1 Relevant ES Consultation Responses

Consultee	Summary of Consultation Letter	FEI Response	Relevant Proposed Conditions
British Horse Society (27/10/2015)	No objection. Attach BHS wind farm guidance for developers and planning authorities.	Comments noted.	N/A
The Crown Estate (06/11/2015)	No objection. States that the Proposed Development lies with an area over which it has granted a mine royal option agreement, but that the assets of the Crown Estate are not affected by the Proposed Development.	Comments noted.	N/A
East Ayrshire Council (EAC) Countryside Access Officer (04/11/2015)	<p>No objection. States that no formal linear access routes, either PRoW or Core Paths, exist within the Development Site, but that a Public Right of Way (PRoW) exists from Dalleagles to the northern boundary of the Development Site, which would not be impacted by the Proposed Development. Provided figures showing PRoW within 5km of the Development Site.</p> <p>State that area wide access rights would be suspended during construction activities and reinstated automatically post construction. State that if the application is approved then adherence to “Good practice during wind farm construction, 2nd Edition 2013, Part 7 Recreation and Access” should be a condition of approval and provide reasoning for this.</p>	Comments noted. As per the figures provided, all PRoW located within 5km of proposed turbines have been identified as receptors and considered within the assessment provided in this Chapter. As noted in section 15.3, a review of all Core Paths located within 5km of the proposed turbines has also been undertaken to confirm their relevance as receptors for consideration in this assessment.	E.ON would accept an appropriately worded condition relating to managing public access during the construction and operational phases. It is recommended that this should be covered as part of the CEMP.
Scottish Rights of Way and Access Society (Scotways) (11/11/15)	No objection. State that the National Catalogue of Rights of Way does not show any rights of way which would be affected by the Proposed Development, but that there may be unrecorded routes not considered. Concerned that recorded rights of way within 10km appear not to have been considered.	Comments noted. However, it is considered that significant effects beyond 5km are unlikely (which is not to conclude that effects within this distance are significant). Therefore, as per the PRoW figures provided by EAC Countryside Access Officer, all PRoW located within 5km of proposed turbines have been identified as receptors and considered within the assessment provided in this FEI Chapter.	N/A

15.5 Implications of Revised Layout

15.5.1 The Revised Layout has a number of implications:

- ▶ Potential changes in predicted economic and employment effects. These effects were calculated within **Chapter 15** of the ES on a per MW basis, so given that the total proposed installed generating capacity of the Proposed Development has changed, the predicted levels of these effects may also change. In practice, any changes in expenditure and employment would result from changes in required procurement, construction and operational/maintenance activities;
- ▶ Potential effects on public access owing to reduced permanent land take required by the Proposed Development;
- ▶ Potential changes in predicted effects on tourism and recreational activities and receptors from the operation of the Proposed Development, owing to the reduction in visibility of turbines at some identified tourism and recreational receptors. Although the new ZTV figures presented within FEI **Chapter 9 - LVIA** show visibility occurring within the same areas as the Original Layout, this visibility is generally of a reduced number of turbines. In broad terms, areas that formerly had the potential for visibility of 10-14 turbines would now have potential visibility of 9-12 turbines, and similarly where 15-19 turbines would have been visible this has been reduced to 13-16 turbines.

15.5.2 Each of these changes is discussed in more detail below.

15.6 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

15.6.1 **Chapter 15** of the ES provided assessments of predicted effects from the construction, operational and decommissioning phases of the Proposed Development on economic receptors, expenditure, employment, land use, recreational activities, recreational receptors (including routes used by tourists and local residents), tourist destinations and visitor attractions. These assessments were informed by other relevant technical assessments provided in the ES, in particular **Chapter 9 – LVIA** and **Chapter 10 – Historic Environment**. The assessments provided in **Chapter 15** of the ES concluded that the Proposed Development would not result in any significant effects on identified socio-economic, tourism, recreational or land use receptors.

15.6.2 Following from the identification of potential environmental effects as a result of the Revised Layout in **Section 15.5**, the subsections below provide assessments of the predicted effects which would arise from the Proposed Development. These assessments should be read in conjunction with the assessments provided in sections 15.10 – 15.14 of the ES. At the outset it should however be noted that the proposed design changes seek to reduce the scale and visibility of the Proposed Development (see FEI **Chapter 9** for full details), which would result in corresponding reductions in predicted effects on tourism, recreational and land use receptors.

Economic and Employment Effects

15.6.3 The assessment provided in **Chapter 15** of the ES adopted a per MW approach when calculating economic and employment effects and utilised empirical data from the following reports:

- ▶ BiGGAR Economics. (2015) Onshore Wind: Direct and Wider Economic Benefits;
- ▶ Department for Energy and Climate Change. (2011). Review of the Generation Costs and Deployment Potential of Renewable Energy Technologies in the UK. London: HM Government; and
- ▶ O'Herlihy and Co Ltd (2006). Windfarm Construction: Economic Impact Appraisal. Glasgow: Scottish Enterprise.

- 15.6.4 A literature review has confirmed that these reports have not been superseded and that no alternative reports, containing revised or updated data for use in relevant calculations, have been published since the submission of the section 36 application. It is therefore considered appropriate and reliable to utilise empirical data from these reports within revised calculations of economic and employment effects. This means that any change in predicted economic and employment effects from the Proposed Development (compared with the effects predicted in **Chapter 15** of the ES) would be due to the proposed change in installed generating capacity, rather than to any changes in the assessment methodology.
- 15.6.5 Detailed calculations of revised predicted construction and operational expenditure are provided in FEI **Appendix 15.A**. In summary:
- ▶ The revised capital cost of constructing the Proposed Development could equate to between £63.7m and £97.9m (including turbine manufacturing) and up to £11.7m could be spent locally. The Proposed Development could directly support up to 84.8 Full Time Equivalent (FTE) local jobs and up to 255.2 FTE jobs within Scotland for the duration of the construction phase;
 - ▶ The revised operations and maintenance cost over the expected 25 year operational period could equate to between up to £32.5m and £177.5m, with up to £3.0m spent locally per annum. During the operational phase, the Proposed Development could directly support up to 24.6 FTE local jobs and up to 33.6 FTE jobs within Scotland for the duration of the expected 25 year operational period;
 - ▶ Other employment is also likely to be supported or generated through induced and indirect economic and employment effects throughout all phases of the Proposed Development.
- 15.6.6 The detailed calculations provided in **Appendix 15.A** indicate that the reduction in the scale of the Proposed Development would reduce expenditure and employment levels by a corresponding amount (approximately 13%) compared with those previously calculated within **Chapter 15** of the ES. However, it is not considered that the revised predicted expenditure and employment would reduce the overall effects previously predicted. Relevant conclusions reached within **Chapter 15** of the ES are therefore considered to remain valid. As such, the Proposed Development is predicted to result in temporary, beneficial substantial and therefore significant economic effects at a local council ward level, however predicted economic effects at council-wide and national levels, as well as all predicted employment effects, would remain not significant.
- 15.6.7 Wind farms are liable for business rates, which would generate an additional economic effect during the operational phase of the Proposed Development. The rateable value of wind farms in Scotland is determined by the relevant Scottish Assessor on a case-by-case basis according to the installed capacity and estimated load rate (akin to a capacity factor). Guidance regarding the valuation of wind farms for business rates purposes is provided within Practice Note 2, Valuation of On-shore Turbines/Wind Farm (Scottish Assessors Association, February 2011), however it must be noted that this guidance states at paragraph 4.1.3 that "*relates to sites accredited with ROC or FIT contracts only*". Given that the Renewables Obligation is now closed to new entrants it is clear that the Proposed Development would not be accredited with ROCs, and indeed the Proposed Development may not be eligible for any other such scheme.
- 15.6.8 It is recognised that the revised scheme with an 8.3MW reduction in generation would result in reduced business rates based on existing applicable rates. A change to the business rates is anticipated from the 1st April 2017, however the value of these have still to be confirmed. Therefore, the conclusion reached within **Chapter 15** of the ES, that the generation of business rates would amount to at most a positive Slight to Negligible and not significant effect, is still considered to remain applicable.

Accommodation

- 15.6.9 No material change to the assessment of potential effects on accommodation receptors is predicted as a result of a three turbine reduction. Therefore it is considered that any predicted effects would remain not significant.

Land Use and Public Access

- 15.6.10 No change to the assessment of potential land use effects is predicted. Whilst the Revised Layout would reduce the permanent land take of the Proposed Development, which would constitute a potential benefit in comparison to the Original Layout, the existing land use (agricultural livestock grazing) across the Development Site would continue to occur with minimal disruption. The predicted effects would therefore remain not significant.
- 15.6.11 All Core Paths and PRoW are considered to have a high sensitivity in terms of guaranteed public access as they benefit from protection afforded under statute. Scottish Hill Tracks, Heritage Paths and other promoted paths are considered to have medium sensitivity in terms of public access, as they are not statutorily protected but are recognised walking routes. Open countryside is considered to have low sensitivity in terms of public access, taking account of the 'right to roam' enshrined within the Land Reform (Scotland) Act 2003.
- 15.6.12 FEI **Figure 9.21** indicates that no public access routes intersect with any proposed infrastructure components, including proposed access tracks. Consequently there would be no direct public access related effect on PRoW d (located within the Development Site) or any other route from any phase of the Proposed Development (indirect visual effects are covered under Recreation below.). As noted within the assessment provided in ES Chapter 15, during the construction phase the public 'right to roam' normally enjoyed through the provisions of the Land Reform (Scotland) Act 2003, would be restricted within the Development Site for health and safety reasons and to ensure compliance with the CDM Regulations 2015.
- 15.6.13 Given the absence of any predicted direct public access effects on non-vehicular routes, the conclusion detailed in ES Chapter 15, that there would be a Small magnitude of change to and a Negligible and not significant effect on public access, is considered to remain valid.

Recreation

- 15.6.14 Scottish Hill Tracks and Heritage Paths were assessed within **ES Chapter 15** as visitor attraction/tourism receptors rather than recreational receptors. The use of³ Core Paths and recreational activities are in all cases considered to be recreational receptors. The use of PRoW are also considered to be recreational receptors, however the recreational value of each PRoW must be identified on a case by case basis as the statutory purpose of PRoW is to maintain access over land, rather than necessary to facilitate recreational activities.
- 15.6.15 The sensitivity of public access routes as recreational receptors (as opposed to public access or visitor attraction/tourism receptors) is dependent upon the recreational value, use and promotion by public bodies of each route as a recreational resource (e.g. evidence of signposting or advertisement). In the absence of site specific evidence to indicate their particular recreational value or promotion for recreational purposes, Core Paths are considered to have Medium sensitivity owing to their status as protected routes forming important path networks under the Land Reform (Scotland) Act 2003. In the absence of evidence to indicate their recreational value or promotion for recreational purposes, PRoW are considered to have Low sensitivity as their purpose is to denote public access over land and historical usage rather than recreational value. However, recognising that an unquantifiable recreational value may be applicable, a precautionary approach has been applied and the sensitivity value for PRoW has been increased to Medium.

³ Not specifically individual human receptors (i.e. individual users), rather the overall use of the relevant route.

Assessment of Effects on Recreational Activities

- 15.6.16 Aside from temporarily halting 'right to roam' access as outlined above, the construction of the Proposed Development is not expected to generate any direct effects on public access routes or specific recreational activities. It is considered that indirect amenity effects on recreational activities would only result in a temporary Negligible magnitude of change on a low sensitivity site, which is not significant in EIA terms.

Assessment of Effects on Public Access Routes

- 15.6.17 With regard to indirect amenity effects during the construction and decommissioning phases of the Proposed Development on public access routes and recreational activities, the level and duration of potential temporary noise and visual effects would vary depending on the nature of individual construction and decommissioning activities being undertaken across the Development Site. Overall, it is considered that the proximity of potentially intense and prolonged construction and decommissioning activities to PRow D would generate at most a temporary Medium magnitude of (negative) change on the amenity value of this Medium sensitivity receptor, resulting in no more than a Moderate and not significant level of effect. All other public access routes are located outside the Development Site at greater distance and would therefore experience a Negligible and not significant level of effect, as would any recreational activities taking place outside the Development Site.
- 15.6.18 An assessment of potential indirect effects from the operational phase of the Proposed Development on the attractiveness of identified Core Paths from all phases of the Proposed Development was provided in **Table 15.16** of **Chapter 15** of the ES. The assessment conclusion, that any potential effects on the attractiveness of these identified Core Paths would be not significant, is considered to remain accurate, as the assessment of visual effects on recreational receptors provided in FEI **Chapter 9** concludes that the Revised Layout would not result in any additional significant visual effects (compared with the Original Layout), indeed visibility would be reduced from some locations, albeit this would not alter the level of significance previously assessed for visual effects on these specific Core Paths.
- 15.6.19 An assessment of potential effects on the attractiveness of the PRow shown on FEI **Figure 9.21** and located within 5km of the proposed site is provided in **Table 15.2** below.

Table 15.2 Assessment of Operational Effects on Public Rights of Way

Recreational Route	Assessment
<p>PRoW route c</p>	<p>The assessment provided in Chapter 9 – LVIA concludes that the Proposed Development would be clearly visible along part of this route; therefore there would be a Medium magnitude of visual change and the level of effect would be at most Substantial / Moderate and significant.</p> <p>This route is not signposted and links EAC Core Path 12: New Cumnock Circular and EAC Core Path 154: Glen Afton, rather than providing recreational value itself. Applying a precautionary approach, the route is considered to have Medium sensitivity as a recreational receptor.</p> <p>Taking account of all aspects of walking as a recreational activity, the directional nature of views of the Proposed Development and the experiential value of this route, the predicted Significant visual effect is considered to result in a Medium magnitude of change on the attractiveness of this receptor. The predicted Moderate level of effect would be not significant.</p>
<p>PRoW route d</p>	<p>The assessment provided in Chapter 9 – LVIA concludes that the Proposed Development would be clearly visible at close range (High magnitude of visual change) from this receptor and the level of visual effect would be Substantial and significant.</p> <p>This route is not signposted from its starting point on the B741 near Dalleagles School House, does not lead to a visitor attraction (rather, only into the open countryside) and is routed south along a farm track and the valley of the Dalleagles Burn, where no physical path is present. Applying a precautionary approach, the route is considered to have Medium sensitivity as a recreational receptor.</p> <p>Taking account of all aspects of walking as a recreational activity, the directional nature of views of the Proposed Development and the experiential value of this local countryside access route, the predicted Significant visual effect is considered to result in a Medium magnitude of change on the attractiveness of this receptor. The predicted Moderate level of effect would be not significant.</p>
<p>PRoW route a, route b, route e and route f</p>	<p>The assessment provided in Chapter 9 – LVIA concludes that visibility of the Proposed Development is likely to range from High magnitude to No View where screened by forestry and level of effect would be Moderate to No View and not significant. A clear view of the Proposed Development would be available from the open summit of Struther's Brae, although views from that part of the relevant PRoW (ProW route f shown on FEI Figure 9.21) would be dominated by the consented / under construction Afton Wind Farm rather than the Proposed Development.</p> <p>Owing to screening provided by forestry combined with a lack of immediate proximity to the Development Site, the Proposed Development would generate a Small magnitude of change on the attractiveness of these Medium sensitivity receptors. The predicted Slight level of effect on these receptors would be not significant.</p>

Tourism

- 15.6.20 Owing to the limited changes in required construction activities and the absence of any identified visitor attractions within the Development Site, no change to the assessment of potential direct effects on tourism receptors is predicted. It is therefore considered that any predicted effects would remain not significant.
- 15.6.21 An assessment of potential indirect effects on the attractiveness (and thus the tourism economy) of identified visitor attractions and tourism destinations was provided in **Table 15.17** of **Chapter 15** of the ES.
- 15.6.22 Of relevance to this assessment, is a study published by BiGGAR Economics in July 2016. This study was conducted as a research report into the effects of wind farms on tourism trends within Scotland and outlines that while onshore wind energy development had more than doubled in the five years to 2014, the employment in the sustainable tourism sector in Scotland had risen by over 10%. In order to address concerns that these headline figures may disguise effects across Scotland through being skewed by data from areas with no onshore wind energy development, the study reviewed evidence at the local authority level and a cross section of 18 wind farms across Scotland. The study concludes on the basis of this analysis that *“there is no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm development”*. It should be noted that EAC challenged the conclusions of this report as part of the Public Local Enquiry into Benbrack Wind Farm following confirmation by the appointed Reporter that this report could be accepted as evidence. For the purpose of this assessment, the BIGGAR report is considered applicable along with other studies reviewed as part of Section 15.6 of the ES (ES **Chapter 15**). The conclusions of the BIGGAR report regarding onshore wind farms and tourism employment, strengthens the conclusions drawn in **Chapter 15** of the ES that there is no conclusive data to demonstrate that tourism is generally adversely affected by wind farm developments.
- 15.6.23 The assessment of visual effects provided in **Chapter 9** concludes that the Revised Layout would not result in any additional significant visual effects (compared with the Original Layout); indeed visibility would be reduced from some locations. Therefore any potential experiential impacts from the Proposed Development on the attractiveness of the identified receptors would either remain the same as assessed within **Table 15.17** of ES **Chapter 15** or would be reduced, meaning that no significant effects on visitor attractions and tourism destinations are predicted.
- 15.6.24 Specifically in relation to the Scottish Dark Sky Observatory (SDSO), no turbine hubs of the Revised Layout would be directly visible from this receptor, meaning that no aviation lighting would be visible either (indeed with the proposed use of infrared lighting, there would be no impact on ‘naked eye’ astronomy in any case). The size of the Proposed Development has also been reduced, minimising the already low level of diffuse scattered emission present from the permanent infrastructure, and there is also likely to be some reduction in the potential for light pollution during construction owing to the reduced number of turbines. Therefore, the conclusion detailed in ES **Chapter 15**, that the Proposed Development is likely to have no significant effect on the SDSO, is still considered to be valid.

15.7 Evaluation of Residual Effects

- 15.7.1 The summary of residual effects remains unchanged from that provided within **Chapter 15** of the ES, as no significant adverse effects are predicted to arise in respect of socio-economic, tourism or recreational receptors.
- 15.7.2 For the avoidance of doubt, the additional assessments presented in this Chapter with respect to public access routes concludes that no significant adverse effects would occur in relation to these receptors.

15.8 Conclusions

- 15.8.1 The conclusion reached within **Chapter 15** of the ES, that there would be no significant adverse effects on recreational receptors, therefore remains valid and unchanged.

15.9 References

BiGGAR Economics. (2015) Onshore Wind: Direct and Wider Economic Benefits. Available at: <http://ruk.pixl8-hosting.co.uk/download.cfm/docid/61F3C8FE-A0E3-4976-AFB4204132342DB2> (Accessed 15/11/2016).

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16. Infrastructure, Telecommunications and Safety

16.1 Introduction and Overview

- 16.1.1 When considering infrastructure and telecommunications impacts and safety, appropriate design and management of a wind farm can avoid potential impacts in these interests. In respect of safety related issues and as noted in the ES, the Proposed Development will be constructed and operated in accordance with all relevant UK health and safety legislation and guidance to ensure the risk to public safety is appropriately managed. The Development Site will be appropriately signed to indicate the presence of construction work; therefore no significant effects are expected.
- 16.1.2 In respect of infrastructure and telecommunications and avoidance of potential impacts, this is generally achieved by the incorporation into the layout design of suitable buffer and separation distances from these assets (as specified by the operators) to mitigate any possible effects. Alternatively, where siting of turbines or associated infrastructure to avoid potential impacts is not feasible, a range of technical solutions can be implemented to mitigate any identified significant impacts.
- 16.1.3 As noted in the ES, a number of telecommunications and infrastructure consultees indicated that they operate telecommunications links or plant in the vicinity of the Development Site. However none of these would be directly affected by the Development.
- 16.1.4 With respect to the Revised Layout, which reduces the number of turbines from 19 to 16, all turbine locations are outside the buffers which have been placed around infrastructure which has the potential to be affected by wind turbines (that is British Telecom (BT) telecommunications link, BT Openreach above and below ground infrastructure, and Scottish Power electrical infrastructure).

16.2 Changes to Policy and Legislative Context

- 16.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.
- 16.2.2 There have been no changes to legislation or national planning policies, advice or guidance of relevance to this FEI chapter.
- 16.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of relevance to this FEI Chapter are:
- ▶ Policy OP1: Overarching Policy;
 - ▶ Policy RE3: Wind energy proposals over 50 metres in height; and,
 - ▶ Schedule 1 – Renewable Energy Assessment Criteria.

16.3 Application Consultation Responses

- 16.3.1 As part of the consultation process undertaken by the Scottish Government following submission of the section 36 application in September 2015, Scottish Water (SW) and British Telecom (BT) provided consultation responses. Amec Foster Wheeler's responses are addressed in **Table 16.1**.

Table 16.1 Consultation Responses Relating to Infrastructure, Telecommunications and Safety

Consultee	Key issues / Points raised	How points raised have been taken into account in the FEI
Scottish Water	<p>Scottish Water responded stating that the “turbines and infrastructure situated to the south of the proposed Enoch Hill Windfarm are located within the boundary for the Carsfad reservoir catchment. Carsfad reservoir is an emergency source which supplies Lochinvar Water Treatment Works and is therefore classed as a Drinking Water Protected Area (DWPA) under Article 7 of the Water Framework Directive. The emergency abstraction point for Carsfad reservoir is a considerable distance downstream of the proposed windfarm development, therefore the risk to water quality should be low.</p> <p>However, as it appears that infrastructure is proposed within the catchment, and as Scottish Water may need to use this source in the future, we require water quality and quantity to be protected.</p> <p>The proposed development is also located in the headwaters of the River Nith catchment where there are four Scottish Water boreholes located downstream. Given the distance involved we do not believe the boreholes activities will be affected by the development of the windfarm.</p> <p>Scottish Water would require to be notified of any pollution incidents likely to affect the Carsfad reservoir catchment and the boreholes downstream of the River Nith.”</p>	E.ON confirms acceptance of a condition requiring preparation of a CEMP and its component parts (PPP, SWMP and CMS) as noted. One of the requirements of the CEMP would be the notification of Scottish Water in the unlikely event of any pollution incidents likely to affect the Carsfad reservoir catchment and the boreholes downstream of the River Nith.
British Telecom (BT)	<p>BT responded stating that: “We have studied this wind farm proposal with respect to EMC and related problems to BT point-to-point microwave radio links.</p> <p>The conclusion is that the project should not cause interference to BT’s current and presently planned radio networks.”</p>	N/A

16.4 Implications of Revised Layout

- 16.4.1 Existing infrastructure and telecommunications links are shown on FEI Figure 16.1. As with the original up to 19 turbine layout, none of the 16 turbines or associated development which comprise the Revised Layout will have any impact on infrastructure or telecommunications.
- 16.4.2 Any potential impacts during construction, operation, decommissioning and cumulative in respect of public safety remains the same as assessed in the ES, see ES **Chapter 16**.

16.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

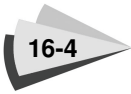
- 16.5.1 Predicted effects remain the same as assessed in the ES, see ES **Chapter 16**.

16.6 Evaluation of Residual Effects

- 16.6.1 As per the Original Layout, all potential effects in respect of infrastructure, telecommunications and public safety arising as a result of the Revised Layout have been fully mitigated in the design of the Proposed Development. No residual effects are therefore predicted to occur.
- 16.6.2 E.ON can confirm that it would ensure the Pollution Prevention Plan (PPP) requires notification to SW of any pollution event which could reach the abstraction at Carsfad Loch or boreholes located in the River Nith catchment.

16.7 Conclusions

- 16.7.1 The conclusions of the ES remain valid; no significant effects on infrastructure, telecommunications or public safety are predicted as a result of the Proposed Development.



17. Aviation

17.1 Introduction and Overview

17.1.1 The potential impacts of wind turbines on aviation interests have been widely publicised. There are two dominant scenarios:

- ▶ Physical obstruction: turbines can present a physical obstruction at, or close to, an aerodrome or other aviation activity area; and
- ▶ Radar / Air Traffic Services: turbine clutter appearing on a radar display can affect the safe provision of air traffic services (ATS) as it can mask unidentified aircraft from the air traffic controller and / or prevent them from accurately identifying, or maintaining identity of, aircraft under their control. In some cases, radar reflections from the turbines can affect the performance of the radar itself.

17.1.2 These scenarios were considered by Osprey Consulting Services Ltd (Osprey), the Aviation consultant and author of **Chapter 17 – Aviation** of the ES and this FEI Chapter, in respect of the Revised Layout and its reduction from up to 19 to up to 16 turbines. The Revised Layout results in a reduction of the impact on the Primary Surveillance Radar (PSR) systems and provision of Air Traffic Services (ATS) associated with Glasgow Prestwick Airport (GPA) and the National Air Traffic Services (NATS) Lowther Hill. The effects would however remain the same for the Revised Layout as for the Original Layout.

17.2 Changes to Policy and Legislative Context

17.2.1 **Chapter 5 – Planning Policy Context** provides a review of all changes to applicable planning policies, advice and guidance of relevance to the Proposed Development since the submission of the section 36 application.

17.2.2 There have been no changes to legislation or national planning policies, advice or guidance of relevance to this FEI chapter.

17.2.3 At the local level, the East Ayrshire Local Development Plan (LDP) has progressed towards adoption with the publication of the East Ayrshire LDP Proposed Plan Examination Report on 6th December 2016. As detailed within FEI **Chapter 5 - Planning Policy Context**, the Examination Report recommended a number of modifications to the East Ayrshire LDP Proposed Plan (2015). Taking account of these modifications, proposed LDP components and policies of direct or indirect relevance to this FEI Chapter are:

- ▶ Policy OP1: Overarching Policy;
- ▶ Policy RE3: Wind energy proposals over 50 metres in height;
- ▶ Schedule 1 – Renewable Energy Assessment Criteria;
- ▶ Policy ENV12: Water, Air and Light and Noise Pollution; and,
- ▶ Policy TOUR4: The Dark Sky Park.

17.3 Application Consultation Responses

17.3.1 Since the section 36 application, further stakeholder consultation activities have taken place and these are summarised in Table 17.1.

Table 17.1 Stakeholder Consultation Activity

Consultee	Summary Response	Action Taken
Ministry of Defence (MOD)	In their letter dated 20 th November 2015, the MOD stated that they had no objection to the site based on the original 19 turbine layout with maximum tip heights of 130m (MOD had previously objected to 150m tip heights). MOD requested that the proposed turbines and anemometry masts are fitted with aviation safety lighting and provide information on the specification of these. MOD gave details of information which should be provided to the Defence Geographic Centre (DGC) and the Defence Infrastructure Organisation (DIO) if the Proposed Development was granted consent.	Consideration of the Revised Layout and the findings of the assessment of any predicted changes to the impact on MOD Low-Flying operations is included in Section 17.4 and 17.5. E.ON confirms acceptance of a condition requiring aviation safety lighting and provision of this information.
NATS	At the request of NATS, a teleconference was held between it, E.ON and Osprey during August 2016. NATS confirmed that provision of radar data from the radar mitigation scheme identified at GPA will offer the best solution for mitigation of the effects on the NATS Lowther Hill PSR. NATS were unable to divulge the commercially sensitive contractual mechanisms involved in facilitating NATS use of the GPA PSR data. NATS objection to the proposed development remains.	Updated radar Line of Sight (LoS) results on this Stakeholder are reported in Section 17.4 to 17.5 below. NATS and E.ON held a follow up teleconference on 15 th November 2016 to discuss progress on the identified mitigation solution. NATS informed the meeting that internal discussions were continuing, in order to agree commercial considerations for the utilisation of the identified radar mitigation scheme. A further teleconference call was completed with NATS on the 8 th December 2016 in which NATS stated that two potential solutions could become available to mitigate the Proposed Development; however, at this stage NATS were not in a position to divulge any details of the two potential solutions. A further teleconference call will be held in February 2017. Once contractual discussions have been finalised between the aviation bodies and E.ON, discussions will continue on the mitigation solution and a potential contract for the use of the radar mitigation scheme as an aviation mitigation solution for the Proposed Development.
GPA	E.ON has entered into an agreement with GPA to mitigate the technical effects of the turbines on the GPA PSR. GPA wrote to East Ayrshire Council on 21 st September 2016 to confirm the withdrawal of their objection provided consent is granted only to E.ON, and with the compliance with the terms and conditions of the agreement (GPA 2016).	Updated radar LoS results on this Stakeholder are reported in Section 17.4 to 17.5 below. It is expected that since the effects are predicted to be less as a result of the Revised Layout (albeit it is a non-significant reduction); the terms of the agreement with GPA will continue to apply. The Revised Layout will be discussed between E.ON and GPA during the normal progression of the agreement between the two parties.

17.4 Implications of Revised Layout

- 17.4.1 The Revised Layout comprises a reduction in the maximum number of turbines planned for the Proposed Development from up to 19 to up to 16 and a reduction in the corresponding horizontal spread of the wind farm across the site. This will result in a reduction in the extent of unwanted returns appearing on the affected PSR systems. The effects would however remain the same for the Revised Layout as for the Original Layout.
- 17.4.2 The implication of the Revised Layout for MOD in respect of Low-Flying operations is that the effects will be reduced as the turbines of Revised Layout will occupy a smaller area of the site compared to the Original Layout. The MOD's request for a lighting scheme for the turbines and anemometer masts remains applicable.

17.5 Predicted Effects: Construction, Operation, Decommissioning and Cumulative

- 17.5.1 The predicted effects during the Construction and Decommissioning phases, and in respect of cumulative effects, remain the same for all stakeholders in accordance with the ES. The changes in the predicted effects during the operational phase are discussed below.

GPA Operational Phase Effects

- 17.5.2 The predicted effects on GPA during the operational phase were reported in the ES as being significant. New LoS analysis for the revised 16 turbine layout concludes that all are theoretically detectable by the GPA PSR and therefore the unmitigated effects remain **significant**. FEI **Appendix 17.A** presents the updated LoS analysis results.
- 17.5.3 GPA has assessed and identified a number of potential solutions likely to mitigate the effects of wind farm development in proximity to the airport as part of a 'regional solution'. In light of progress made in these works, GPA and E.ON have entered into an agreement to secure radar mitigation in relation to the Proposed Development. GPA will ultimately select the most appropriate mitigation scheme for the Proposed Development; however, the solution is expected to be predicated on the removal/suppression or prevention of the unwanted radar returns on the GPA PSR, associated with the turbines. The post-mitigation effects are predicted to be **non-significant**.

NATS Operational Phase Effects

- 17.5.4 The predicted effects on NATS Lowther Hill PSR in the operational phase were reported in the ES as being significant. New LoS analysis for the Revised Layout concludes that 15 of the 16 turbines are theoretically detectable by the NATS Lowther Hill PSR and therefore the effects remain **significant**. FEI **Appendix 17.A** presents the updated LoS analysis results.
- 17.5.5 Discussions are in progress between NATS and E.ON regarding a suitable mitigation scheme for the Proposed Development. Teleconferences between the two parties were completed during August and November 2016 which indicated that the radar mitigation scheme being planned for GPA presented the most suitable radar infill solution for the effects on NATS Lowther Hill PSR. During a teleconference held on the 8th December 2016, NATS stated that two potential mitigation solutions could become available to mitigate the Proposed Development, although NATS were not in a position to divulge details of the two potential solutions. A further teleconference call will be held in February 2017, in which details of the route to mitigation will be discussed further.
- 17.5.6 The post-mitigation effects are predicted to be **non-significant**.

MOD Operational Phase Effects

- 17.5.7 The horizontal spread of the turbines in the Revised Layout is reduced, albeit by a small amount in comparison with the original application. This will result in a small increase in the airspace available for military Low-Flying operations. The effects therefore remain **non-significant** and given that the MOD has not objected to the Original Layout, it is not expected to object to the Revised Layout of the Proposed Development.

17.6 Evaluation of Residual Effects

GPA

- 17.6.1 The Revised Layout remains within operational range and theoretical radar line of sight of the GPA PSR system and the unmitigated effects remain significant. E.ON has entered into an agreement with GPA regarding a suitable radar mitigation scheme for the Proposed Development.
- 17.6.2 GPA has stated that determination of the application for the Proposed Development will give GPA certainty as to the timeframe of achieving the mitigation scheme. The residual effects post-mitigation are predicted to be **non-significant**.

NATS

- 17.6.3 The Revised Layout remains within operational range and theoretical radar line of sight of NATS Lowther Hill PSR system. NATS has indicated that a radar infill solution based on the use of the GPA radar mitigation scheme offers a credible option for mitigation of the effects on the NATS Lowther Hill PSR. Further liaison between E.ON and NATS is planned during February 2017 to discuss progress of the route to mitigation for the Lowther Hill PSR. At the time of writing this FEI chapter, the NATS objection remains however, given the solutions under consideration, the residual effects post-mitigation are predicted to be **non-significant**.

MOD

- 17.6.4 Appropriate resolution and agreement in respect of Proposed Development with regard to the MOD lighting requirement will be determined through on-going consultation. Residual effects, post agreement of the lighting scheme, are evaluated as **non-significant**.

17.7 Conclusions

- 17.7.1 The Revised Layout presents a small reduction in the predicted effects on all aviation stakeholders with the (unmitigated) effects remaining significant in respect of both the GPA (airport) and NATS' (en-route) infrastructure. Consultation activities undertaken since the application have resulted in the removal of the objection from GPA subject to the terms and conditions of an agreement between E.ON and GPA in respect of a mitigation solution.
- 17.7.2 The NATS objection to the Proposed Development remains in place but discussions between NATS and E.ON predicated on the use of (post-mitigation) GPA PSR data are expected to address this objection, such that it can be dealt with through the use of a suspensive condition.
- 17.7.3 The MOD has not objected to the 19 turbine Original Layout and as such is not expected to object to the Revised Layout.
- 17.7.4 Based on the progress of discussions and agreements made to date with stakeholders, post-mitigation effects are predicted to be **non-significant** for all aviation stakeholders.

17.8 References

GPA. (2016) 160921 – Enoch Hill – e-mail from Glasgow Prestwick Airport removing objection – 21 September 2016.

18. Summary of Additional Mitigation and Residual Effects for the Proposed Development

- 18.1.1 The mitigation measures as described in the ES (**Chapter 18**) would all apply to the Revised Layout. The following items of additional mitigation have been identified as a result of this FEI assessment:

LVIA

- 18.1.2 A full description of the mitigation included with the Proposed Development is described in the ES (**Chapter 9**) and updated, as required, in the Landscape Design Statement (FEI **Appendix 9.A**).
- 18.1.3 Particular design mitigation measures include the location of site infrastructure (anemometer masts, the Scottish Power Energy Networks (SPEN) substation compound, temporary construction compounds, borrow pit search areas and Development Site access / on-site access tracks) have all been located to areas of the Development Site where there would be limited visibility from the main receptors to the north and northeast in the Upland Basin Landscape Character Type. In particular the SPEN compound, borrow pit search areas and access tracks have been located as far as possible to the lee of hills or southern and southwest positions and summits to reduce visibility. The success of this design approach can be seen in the visualisations prepared for those viewpoints within 5km where the proposed infrastructure has been rendered onto the photomontages where visible (Viewpoints 1, 2, 3, 4 and 5). As can be seen from these viewpoints, there would be limited visibility of the associated infrastructure from these locations.

Ecology

- 18.1.4 With bat activity (particularly for Leisler's bat/*Nyctalus* sp.) being comparatively high on the western edge of the site, the risks posed to this species group during the summer months appear to be potentially high. Curtailment of turbines T1, T3, T4 and T16 between June – August inclusive for three hours after sunset when wind speeds are below 6m/s. will therefore be implemented (to be secured through Planning Condition).
- 18.1.5 A post-construction monitoring strategy for bat activity and mortality would be developed in line with relevant prevailing Bat Conservation Trust (BCT) and / or SNH guidance and secured through Planning Condition. It is anticipated that operational phase monitoring would involve, as a minimum, ground level static detector surveys utilising areas below turbines coupled with "control" sites away from turbines. Use would also be made of permanent met masts where possible.
- 18.1.6 The Applicant has agreed to prepare a Construction Environment Management Plan (CEMP) which would detail species protection plans for otter and water vole within the Development Site boundary, would set out any specific environmental management requirements such as Environmental Clerk of Works (ECoW) requirements for aquatic monitoring and protection measures, pollution control and contingency procedures and would incorporate mitigation measures relating to GWDTEs (Groundwater Dependent Terrestrial Ecosystems). This commitment would be secured through Planning Condition.
- 18.1.7 Consideration would be given to deer prior to construction and a Deer Management Statement prepared if required.
- 18.1.8 A water quality monitoring programme at on-site locations and / or publically accessible off-site locations would be secured by a Planning Condition if the Proposed Development is granted consent.

Ornithology

- 18.1.9 E.ON would accept a Planning Condition to implement a programme of on-site post construction bird monitoring and, as requested by the RSPB, to implement a habitat management plan to mitigate the effects on peatland and enhance the habitat for black grouse and golden plover, both within the Development Site.

Geology, Hydrology and Hydrogeology

- 18.1.10 A water quality monitoring programme and CEMP would be prepared as described in paragraphs 18.1.8 and 18.1.10 (FEI **Chapter 18**).
- 18.1.11 In respect of Private Water Supplies (PWS), monitoring in the general vicinity of Craighouse Cottage PWS source would be undertaken at a surrogate spring or surrogate borehole installed by the Developer, such that samples collected would be at a frequency and assessed for a suite of parameters compliant with Appendix 5 of SEPA's Land Use Planning System Guidance Note 31 (LUPSGU31).

Traffic and Transport

- 18.1.12 E.ON would agree a mechanism with EAC to pay for any extraordinary road damage / road damage from abnormal loads, and agree to a bond being lodged with EAC to pay for repair of any such road damage.
- 18.1.13 Based on the consultation response received from Transport Scotland, E.ON would accept conditions such that:
- ▶ *“Prior to commencement of deliveries to site, the proposed route for any abnormal loads on the trunk road network must be approved by the trunk roads authority prior to the movement of any abnormal load. Any accommodation measures required including the removal of street furniture, junction widening, traffic management must similarly be approved”;* and
 - ▶ *“During the delivery period of the wind turbine construction materials any additional signing or temporary traffic control measures deemed necessary due to the size or length of any loads being delivered or removed must be undertaken by a recognised QA traffic management consultant, to be approved by Transport Scotland before delivery commences”.*

Socio-economics, Tourism and Recreation

- 18.1.14 In relation to managing public access during the construction and operational phases, E.ON would accept an appropriately worded condition relating to access arrangement during construction. It is recommended that this should be covered as part of the CEMP.

Infrastructure, Telecommunications and Safety

- 18.1.15 A CEMP would be prepared as described in paragraphs 18.1.8 and 18.1.10 (FEI **Chapter 18**). One of the requirements of the CEMP would be the notification of Scottish Water in the unlikely event of any pollution incidents likely to affect the Carsfad reservoir catchment and the boreholes downstream of the River Nith.

Aviation

- 18.1.16 E.ON would accept a condition requiring aviation safety lighting and provision of information relating to the Proposed Development (as specified by the MoD) to the Defence Geographic Centre (DGC) and the Defence Infrastructure Organisation (DIO).
- 18.1.17 In respect of effects on Glasgow Prestwick Airport (GPA) Primary Surveillance Radar (PSR), GPA has assessed and identified a number of potential solutions likely to mitigate the effects of wind farm development in proximity to the airport as part of a 'regional solution'. In light of progress made in these works, GPA and E.ON have entered into an agreement to secure radar mitigation in

relation to the Proposed Development. GPA will ultimately select the most appropriate mitigation scheme for the Proposed Development; however, the solution is expected to be predicated on the removal/suppression or prevention of the unwanted radar returns on the GPA PSR, associated with the turbines.

- 18.1.18 In respect of effects on National Air Traffic Services (NATS) Lowther Hill PSR, NATS have stated that two potential solutions could become available to mitigate the Proposed Development; however, at this stage NATS were not in a position to divulge any details of the two potential solutions. Once contractual discussions have been finalised between the aviation bodies and E.ON, discussions will continue on the mitigation solution and a potential contract for the use of the radar mitigation scheme as an aviation mitigation solution for the Proposed Development.

