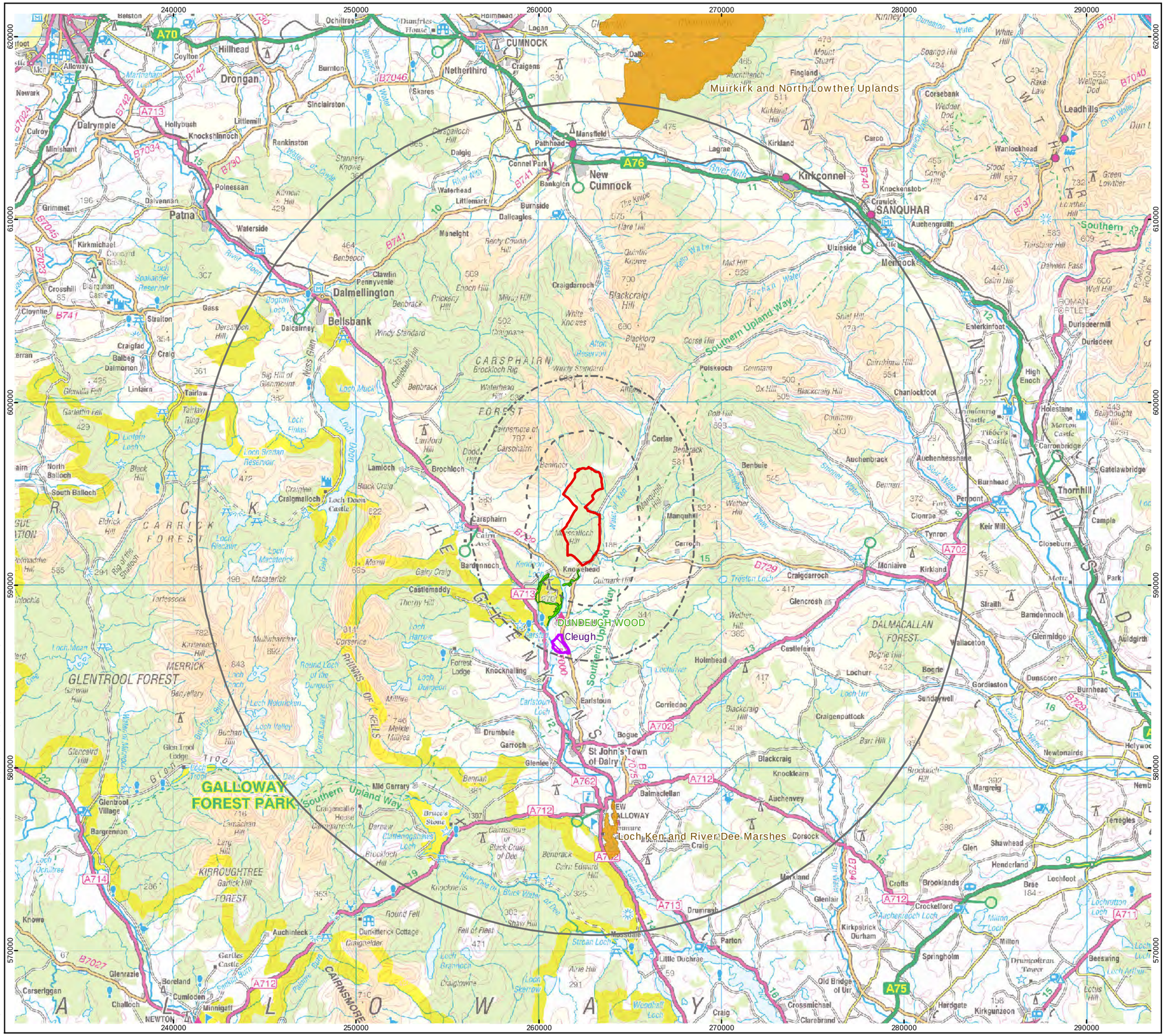


INFINERGY

ARCUS

- Site Boundary
- 2 km Study Area
- 5 km Study Area
- 20 km Study Area
- Ancient Woodland Inventory
- Site of Special Scientific Interest
- Special Protection Area

1:200,000 Scale @ A3

0 5 10 km

N

Produced: SC
Reviewed: LHu
Approved: AM

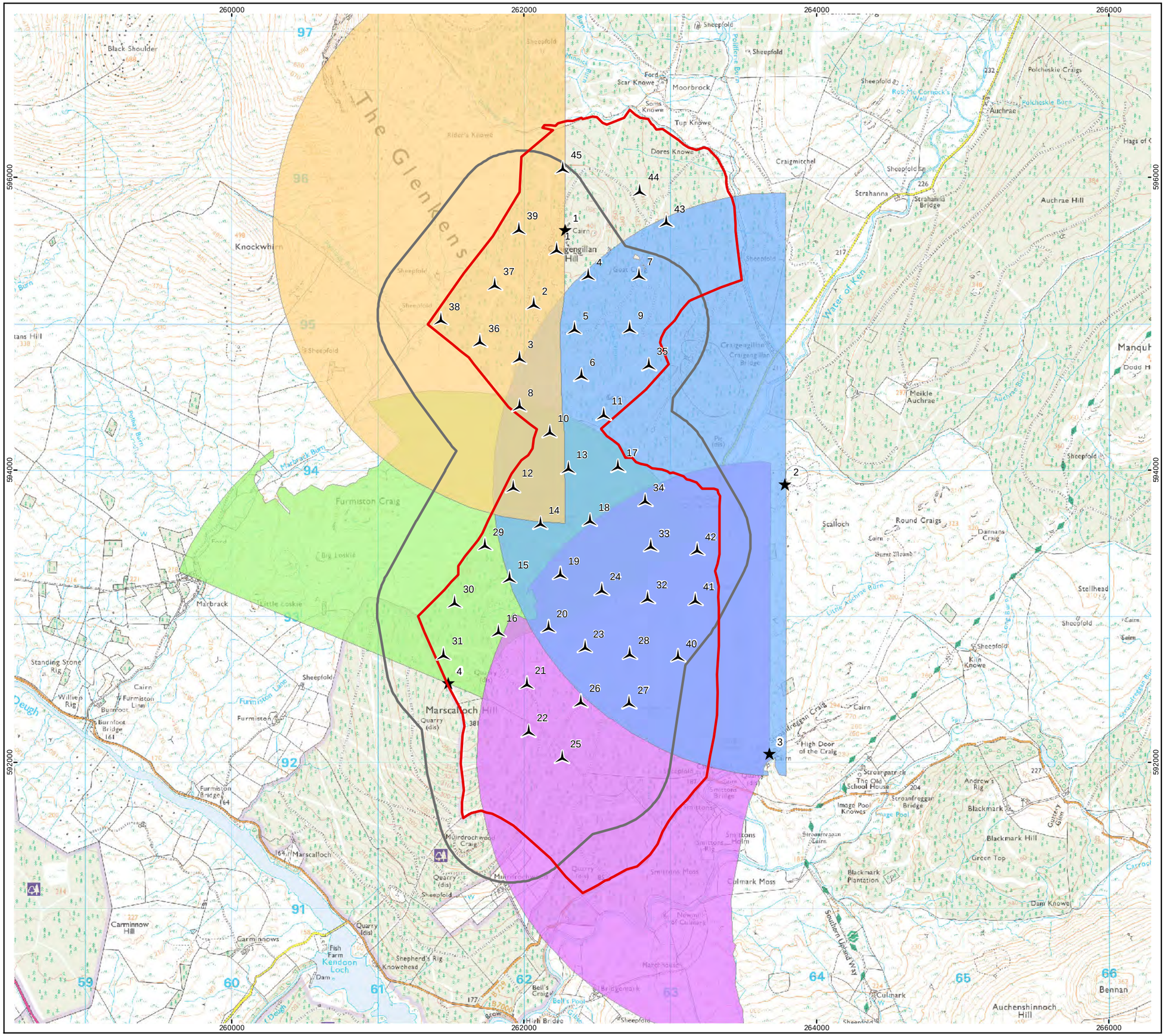
Ref: 1236/SR/011 | Revision: A

Date: 04/04/2013

Ecological Designations
Figure 5

Shepherds' Rig Wind Farm Scoping Report

P:\Projects\1236 Infinergy DG Tenders\Sheperds Rig\MXDs CAD\Scoping\1236_SheperdsRig_Fig05_Ecological_Designations.mxd



INFINERGY

ARCUS

- Proposed Turbine Location
- Site Boundary
- Vantage Point (VP)
- 500 m Survey Area
- VP 1 Viewshed
- VP 2 Viewshed
- VP 3 Viewshed
- VP 4 Viewshed

1:25,000 Scale @ A3

0 0.5 1 km

N

Produced: SC
Reviewed: LHu
Approved: AM

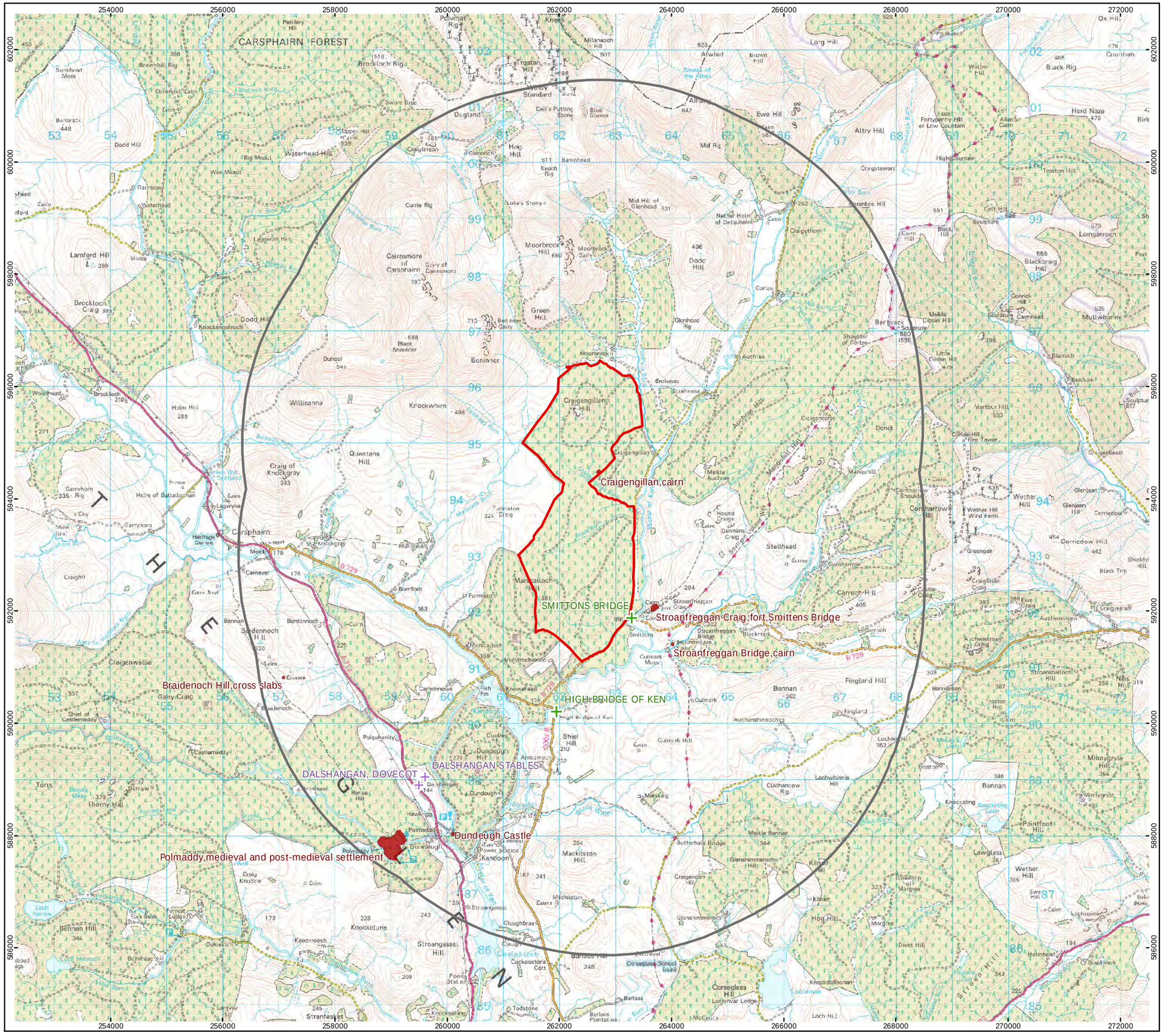
Ref: 1236/SR/021 | Revision: A

Date: 04/04/2013

Vantage Points and Viewsheds Figure 6

Shepherds' Rig Wind Farm Scoping Report

P:\Projects\1236 Infinergy DG Tenders\Sheperds Rig\MXDs CAD\Scoping\1236_SheperdsRig_Fig06_VantagePoint_Viewshed.mxd



INFINERGY

ARCUS

- Site Boundary
- 5 km Cultural Heritage Study Area
- \+ Category B Listed Building
- \+ Category C(S) Listed Building
- Scheduled Monument

1:65,000 Scale @ A3

0 1 2 km

N

Produced: SC
Reviewed: LHu
Approved: AM

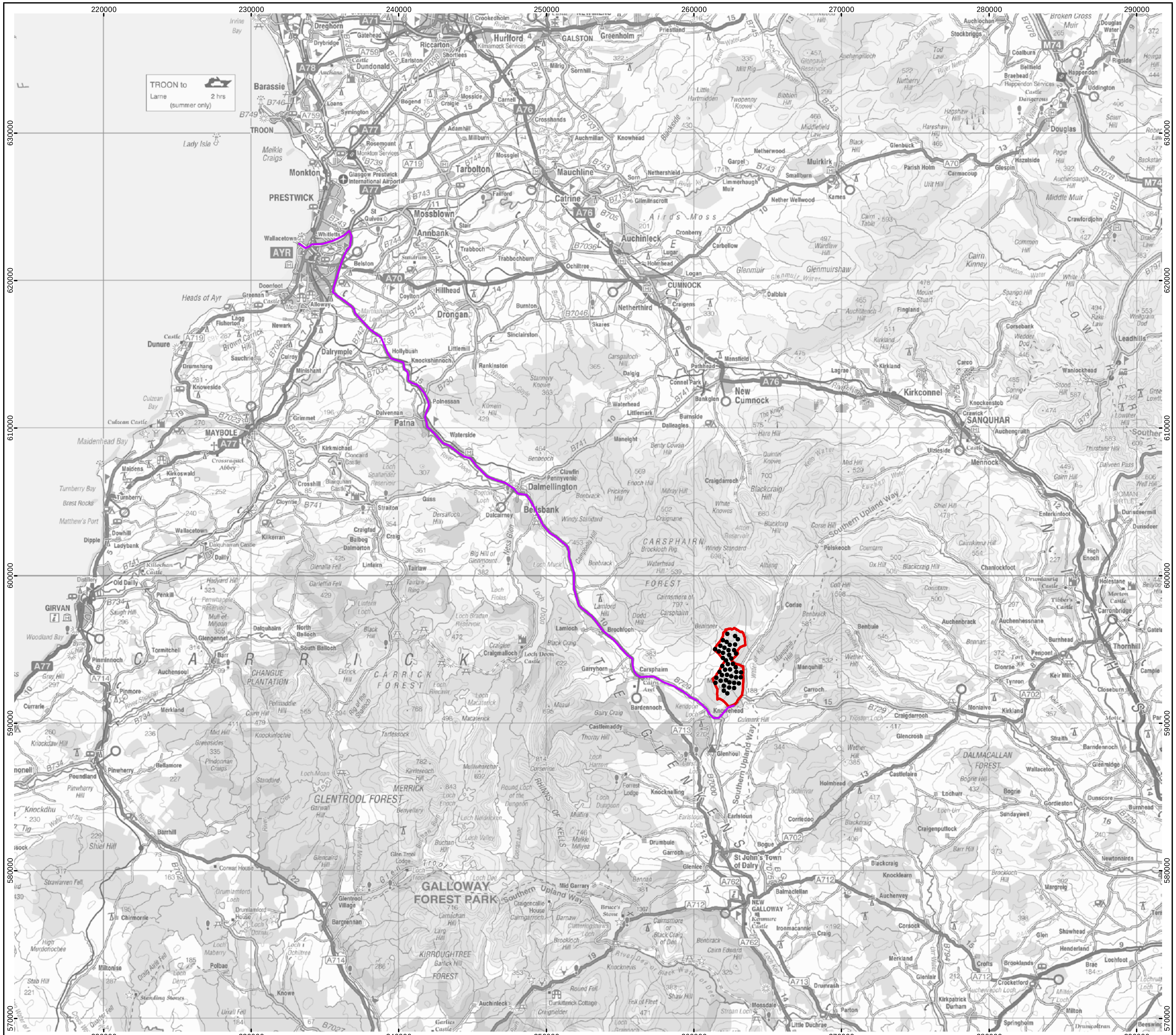
Ref: 1236/SR/012 | Revision: A

Date: 04/04/2013

Cultural Heritage Designations Figure 6

Shepherds' Rig Wind Farm Scoping Report

P:\Projects\1236 Infinergy DG Tenders\Sheperds Rig\MXDs CAD\Scoping\1236_SheperdsRig_Fig07_CH_Designations.mxd



INFINERGY

ARCUS

• Proposed Turbine Location

Site Boundary

Potential Turbine Delivery Route to Site

1:250,000 Scale @ A3

0 5 10 km

N

Produced: SC
Reviewed: LHu
Approved: AM

Ref: 1236/SR/010	Revision: A
Date: 04/04/2013	

Turbine Delivery Route
Figure 8

Shepherds' Rig Wind Farm
Scoping Report

P:\Projects\1236 Infinergy DG Tenders\Shepherds Rig\MXDs CAD\Scoping\1236_ShepherdsRig_Fig08_Transport_Delivery_Route.mxd

APPENDIX B – CUMULATIVE SITES

Name	NGR (approx)	No. of Turbines	Hub height	Rotor diameter	Height to Tip	Approximate distance between nearest turbines	Info. Source
Operational							
Wether Hill	270200 594100	14				6.4km	Scottish Power Renewables
Hare Hill	265000 609000	20				14.2km	RES EAC
Dalswinton	294500 589300	15				31.3km	Infinis
Glenkerie	309245 627889	11	60m	80m	110m	56.0km	SBC
Hagshaw Hill	278000 630000	26	35m	44m	55m	37.5km	SLC / The Wind Power website
Hagshaw Hill Ext.	280000 630000	20	49m	62m	80m	39.3km	SLC
Myres Hill	256000 646000	2	40m	52m	76m	50.3km	East Renfrewshire / The Wind Power
Whitelee	256918 645743	140	90m	100m	140m	50.1km	East Ayrshire Council
Hadyard Hill	225700 596400	52		80m		34.0km	SSE
Artfield Fell	223000 567000	15	43m	62m	74m	46.7km	DP Energy / SSE wibsites
Robin Rigg	290582 540875	60				56.9km	
Nutberry	277000 632000	6			125m	14.1km	Slc / Falck Renewables
Lochhead Wind Cluster	277766 646534	3	59m	82m	100m	53.3km	SLC / The Wind Power
Windy Standard	261849 601965	36	35m	43m	56.5m	4.5km	
Approved or Under Construction							
Torrs Hill	252920 589240	2			100m max.	8.9km	
Windy Standard Ext.	260219 602115	30			12@100m max. 18@120m max.	5.4km	SG S.36
Blackcraig	270700 582250	23				11.7km	SG
Whiteside Hill	271000 505000	13	80m	82.4m	121.2m	12.1km	D&G
Mark Hill	225200 584650	28			110m	37.0km	BWEA & Force 9 Energy
Arcleoch	217225 579681	60	90m	90m	135m	43.9km	BWEA SG

Name	NGR (approx)	No. of Turbines	Hub height	Rotor diameter	Height to Tip	Approximate distance between nearest turbines	Info. Source
Over Enoch	257000 648000	2	69m	44m	91m	52.8km	East Renfrewhisre
Ardoch Farm	258000 648000	3			91m	52.5km	SLC
Blantyre Muir	267000 652000	6	70m	90m	115m	57.3km	SLC / West Coast Energy
Calder Water	642000 260000	14			147m	45.8km	SLC Community Windpower
Whitelee Ext. 1	254813 254813	39	90m	100m	140m	46.7km	
Whitelee Ext. 2	254647 647400					46.6km	
Whitelee Ext. 3	254700 642400					45.8km	
Bankend Rig	265000 633000	11			76m	36.7km	SLC
Dungavel	268607 635860	13	60m	80m	102m	39.1km	SLC
Lochhead Ext.	278000 646000	2			100m	52.3km	SLC
Marshill Farm 1	278991 645474	1			67m	52.1km	SLC
Tanhill Farm	277469 644427	1			76m	50.6km	
North Brackenridge	275400 606600					45.9km	
Birkhill Commercial Park	283859 635603	1				44.9km	SLC
Clyde Windfarm	298234 626749	152			125m	38.7	SLC
Harestanes / Forest of Ae	301516 598743	71 max.	70@80m 1@70m	70@90m 1@90m	125m 115m	37.0km	
Submitted but not yet determined							
Afton	262300 603980	27	5@60m 22@80m	5@100m 22@120m	5@110m 22@140m	8.0km	E.om
Margree	268981 586834	17			120m	8.1km	
Hare Hill Ext. 2	266682 608875	39				13.3km	
Blackhill / Sanquhar Community WF	271200 608300	18			126.5m	14.9km	Community Wind Power website
Ulzieside	275400 606600	20	80m		125m	12.3km	Community Wind Power website
Burnhead	247800 608550	13			127m	19.1km	Burnhead Wind Farm website
Dersalloch	241950 604450	23			7@115m 16@125m	21.6km	Dersalloch Wind Farm website

Name	NGR (approx)	No. of Turbines	Hub height	Rotor diameter	Height to Tip	Approximate distance between nearest turbines	Info. Source
Breaker Hill	218020 588360	15	69m	60m	99m	43.8km	Wind Prospect ES
Carscreugh	222350 560000	18			70m	50.3km	Renewables Map
Barlockhart	222300 556450	4	60m	84m	102m	52.7km	Renewables Map
Newfield	316590 586705	21	80m	90m	125m	53.0km	s.36 DPEA
Earlshaugh	309250 615150	24				47.8km	SBC
Clyde Ext.	302450 622050					47.5km	
Andershaw	284320 625400	14			125m	36.3km	SLC
Middlemuir	285336 626157		84m	104m	136m	37.9km	SLC
Glentaggart	283286 626637	5	80m	104m	132m	38.1km	SLC / Infinis
Spireslack / Galawhistle	276000 629000	42			125m	35.1km	SLC
Auchrobert	276471 638234	15			85 – 150m	44.4km	SLC
Woodlands Farm	279826 639404					46.7km	SLC
Hawksland	284876 639931	1			54m	49.2km	SLC
Kype Muir	271485 655895	26			125 / 132m	46.5km	
Chapelton	267222 648881					52.7km	
Cowans Law	251728 251728	25			126m	47.0km	
Harelaw Renewable Energy Park	247732 650857	39	78m	80m	119m	54.6km	East Ayrshire
Marshill 2	278991 645474	1			119m	52.1km	SLC
Refused, Subject to Appeal							
Southmains	278600 607900`	3			84m	19.8km	DPEA
Mayfield	272900 556200	6	80m	100m	130m	37.3km	

APPENDIX C – ORNITHOLOGY SURVEY METHODS

Details of Ornithological Survey Methodology at the proposed Shepherds' Rig Wind Farm Site

19.1. Below is a detailed summary of the timing and methods to be employed by Natural Research (Projects) Ltd. (NRP) during the course of ornithological surveys. They are an elaboration of the methods described, more generally, in the main Scoping document.

Moorland breeding bird survey

19.2. Open land (to include scrub, isolated trees and copses) will be surveyed using a modified version of the Brown and Shepherd (1993)[64] method for upland bird survey during April – June 2013.

19.3. Timing: The site will be surveyed four times, during the period mid-April to end June 2013. Fieldwork will not be undertaken in conditions considered likely to affect bird detection for example strong winds (greater than Beaufort Scale Force 4), persistent precipitation, poor visibility (less than 300 m), or in unusually hot or cold weather.

19.4. Field methods: Survey walk-routes will attempt to optimise ground visibility. Surveyors pause at appropriate vantage and listening points. Isolated trees, copses and patches of scrub will be approached and examined. Streams and ditches will be walked. All other areas will be approached to within 100 m. Registrations will be mapped at the first location that behaviour indicative of breeding is observed. Care will be taken to avoid recording individuals exhibiting breeding behaviour more than once.

Woodland breeding bird survey:

19.5. Timing: Each count point will be visited twice, once during the period mid-April to mid-May and once during the period 1-21 June. The aim will be to undertake fieldwork between sunrise and sunrise + 6 hrs, when activity by most woodland birds peaks. Fieldwork will not be undertaken in conditions considered likely to affect bird detection for example strong winds (greater than Beaufort Scale Force 4), persistent precipitation, or in unusually hot weather.

19.6. Field methods: On arrival at each count point surveyors will pause to allow birds to acclimatise to the observer's presence. Thereafter, all birds seen or heard during a 5-minute recording period will be noted, together with details of any breeding behaviour. The dominant woodland/forest type at each count point will be classified as:

- Coniferous plantation;
- Native coniferous;

[64] Brown, A.F. and Shepherd, K.B. (1993) A method for censusing upland breeding waders. Bird Study 40: 3 pp189-195

- Broadleaf; and
- Mixed coniferous / broadleaf.

19.7. In coniferous plantations the forest growth stage will be classified as:

- Establishment;
- Developing pre-thicket;
- Thicket, pole and high forest;
- Clearfell; and
- Pre-thicket.

Flight activity survey

19.8. The aims are (1) to record flight activity within the vicinity of the Proposal in order to identify areas of greatest importance to birds and (2) to quantify flight activity in the vicinity of the likely turbine locations in order to estimate collision risk. The methods given in Band, Madders & Whitfield (2007)[65] are being used.

19.9. Timing: Watches are being undertaken in each month of the year. A total of at least 79 hours from each of 2 Vantage Points (VPs) will be completed during the 12 months of survey. Watches are being undertaken in a range of weather conditions excepting poor visibility (< 300 m) and are being spread temporally to include a representative number of hours early and late in the day.

19.10. Field methods: Information is being collected during timed watches from VPs. During the reconnaissance survey period, trial observations were conducted from potential VP locations and visible areas were ascertained using GIS analysis. These were then used to determine the final VP locations so as to maximize the area visible. A map of the VPs used and visible areas has been provided (see Figure 6 in Appendix A of this Scoping Report). Care is taken to minimise possible disturbance to birds. Normally, all points within the survey area will be within 2 km of a VP. For species of high nature conservation importance the following data are being recorded:

- The flight lines used by individual birds;
- The time spent flying over a defined survey area; and
- The proportion of flying time spent at a range of flying heights (< 10 m, 10-50 m, 50-100 m, 100-150 m or > 150 m).

19.11. For other selected bird species (secondary species) an index of activity will be calculated based on the number of 5-minute periods that birds are observed. The location of activity indicative of breeding by raptors is being recorded.

[65] Band, W., Madders, M. & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M, Janss, G. & Ferrer, M. (eds). Birds and Wind Power. Lynx Edicions, Barcelona.

Breeding diurnal raptor survey

19.12. The aim is to determine the distribution of breeding attempts of diurnal raptors within and adjacent to the Proposal during the period March – June 2013.

19.13. Site visit information and the habitat map suggest that for a 2 km radius of this Proposal the habitat is potentially suitable for breeding goshawk, hen harrier, merlin, peregrine and short-eared owl. However, evidence of breeding by any other raptor species listed in Schedule 1 of the Wildlife & Countryside Act (1981) will be investigated thoroughly. Breeding success will also be recorded wherever possible, since it is an important determinant of flight activity levels. Surveys will be undertaken under licence from SNH by experienced field ornithologists. Extreme care will be taken to avoid unnecessary disturbance to breeding birds.

19.14. Methods follow those described in Hardey *et al.* (2009)[66].

19.15. *Goshawk*: Suitable woodland habitat within 1 km of the site will be searched for evidence of occupation by breeding goshawk (*e.g.,* nests, plucked prey, moulted feathers, pellets and faeces) during late March to early April. Potential nesting areas will be re-visited during the period May to August to confirm breeding outcome. Note that surveyors received intensive training on the detection of goshawk signs from Dr M Marquiss during courses organised by Natural Research in March 2004 and 2012.

19.16. *Hen harrier*: Areas of suitable habitat will be observed during the period 20 March – 30 April and behaviour indicative of breeding recorded. Unsuitable areas include land above 600 m; improved pasture and arable land; extensive areas of degraded land with no heather cover and low vegetation; the vicinity of cliffs, rocky outcrops, boulder fields and scree; areas within 100 m of hill farms and occupied dwellings. At sites where breeding is suspected, further observations will be undertaken during the period 1 May - 10 June to locate nests. Potential nest areas will be watched for 3-4 hours if necessary. Occupied nests will be visited at least twice during the period 15 May to 31 July to determine breeding success. Any roosting birds found to be present during the non-breeding period will be surveyed.

19.17. *Merlin*: Areas of suitable nesting habitat (including forest edge where trees > 5 m high) will be closely observed during the period 20 March - 30 April. Boulders, fence lines, isolated posts, stone dykes, grouse butts, hummocks, stream banks, crags, trees and recently burnt areas of heather will be checked for signs of occupation (*e.g.,* plucked prey, moulted feathers, pellets and faeces). Any corvid nests detected will be mapped. Areas where merlins are observed or signs found will be visited at least twice (incl. once in May and once in early July) to verify occupation of the site. Potential nest areas will be watched for 4-6 hrs if

[66] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B., and Thompson, D. (2009) Raptors: a field guide to survey and monitoring. The Stationary Office, Edinburgh.

necessary. All located corvid nests will be visited during the period May-July.

19.18. *Peregrine*: Potential nest sites will be visited and checked for evidence of occupation in March and April. Sites to be checked will include nest sites found in previous years by raptor study group workers and crags and steep banks identified from OS maps and searches of the survey area. Surveyors will look for birds or signs of occupation (*e.g.,* faecal splash, fresh plucked prey). Occupied sites will be re-visited between 20 March and 10 May to verify incubation. Searches will be made for eyries. Where this is not possible sites will be watched from a suitable vantage point for 3-4 hours or until a nest is located. Further visits will be made during the period 20 May to 10 July to monitor breeding success.

19.19. *Short-eared owl*: At least two visits will be carried out between early April and the end of May. Suitable habitat will be visited and checked for evidence of hunting males, territorial activity and other signs of presence. If birds are present but breeding is not confirmed, a further visit will be made in June. Any roosting birds found to be present during the non-breeding period will be surveyed as per hen harrier (see above).

19.20. *Barn owl*: The aims of the survey are to determine the distribution and occupancy of potential barn owl breeding sites within 1 km of the Proposal. Timing and field methods: Each area where barn owls are potentially present will be surveyed twice, once during the period May-June 2013. Fieldwork will not be undertaken in persistent precipitation. The survey area will be searched systematically to locate potential nest sites, including buildings, nest-boxes, trees along woodland edges, and hay-bale stacks. Visits will be undertaken during late afternoon. Where examination of potential nest sites is inconclusive, the site will be watched at least once from one hour before, until one hour after, sunset.

Assessment of field vole abundance:

19.21. Field methods: Initial site visits and habitat identified areas of habitat suitable for voles. Twenty-five quadrats (each 25 x 25 cm) will be randomly located within a representative area of rank grassland and searched for evidence of field vole activity. The presence / absence of the following signs will be recorded: runways in the vegetation, fresh vegetation clippings indicative of voles feeding, and fresh vole faeces. Assessments will be carried out monthly, April to September 2013.

APPENDIX D – LIST OF CONSULTEES

Dumfries and Galloway Council
SEPA
SNH
Forestry Commission
Historic Scotland
Transport Scotland
Association of Salmon Fishery Board
Civil Aviation Authority - Airspace
The Crown Estate
Defence Infrastructure Organisation
NATS Safeguarding
RSPB Scotland
Mountaineering Council of Scotland
Scottish Water
Visit Scotland
John Muir Trust
Scottish Wildlife Trust
British Horse Society
Scottish Rights of Way and Access Society (ScotWays)
Prestwick Airport
Carsphairn Community Council
Carsphairn Heritage Group
Carsphairn Renewable Energy Fund Ltd