Appendix 9.2 Baseline Bird Survey Report

Banniskirk Substation and Converter Station

PREPARED FOR
SSEN Transmission

DATE
30 October 2024

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Appendix 9.2 Baseline Bird Survey Report

Banniskirk Substation and Converter Station

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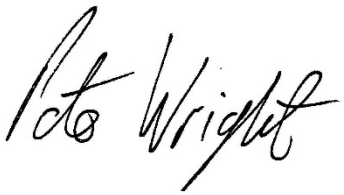

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BBS	Breeding Bird Survey
BoCC	Birds of Conservation Concern. A list of birds' conservation status, reviewed every five years, measured by changes to changes in species population size.
BTO	British Trust for Ornithology.
CRH	Collision Risk Height. The band of height at which a bird is at risk from colliding with the feature under assessment.
ESA	Ecology Survey Area
HVDC	High Voltage Direct Current
kV	Kilovolt
NS	NatureScot (previously, Scottish Natural Heritage).
OHL	Overhead power line.
OS NGR	Ordnance Survey National Grid Reference
S1 birds	Schedule 1-listed birds. Birds afforded additional protection under the WCA.
SBL	Scottish Biodiversity List. A list of habitats and species identified for specific conservation action.
SGT	Super Grid Transformers
SSEN	Southern Electricity Networks Transmission
SuDS	Sustainable Drainage Systems
SYNCOM	Synchronous Compensators
VP	Vantage Point
WCA	The Wildlife and Countryside Act (as amended), Scotland, 1981.
ZoI	Zone of Influence

1. INTRODUCTION

This report summarises the results of surveys undertaken to provide information on the baseline bird assemblage in connection with Banniskirk Hub, a proposed 400 kilovolt (Kv) substation and a High Voltage Direct Current (HVDC) Switching Station (hereafter referred to as 'the Proposed Development') by Scottish and Southern Electricity Networks Transmission (SSEN Transmission). The following terminology is used through this report:

- The Site: all land within the proposed red line site boundary, as shown on**, Figure 1, Appendix A**;
- Ecology Survey Area (ESA): the land in which ecological bird surveys were undertaken based upon the Zone of Influence (ZoI) of the Proposed Development, as shown on **Figure 1, Appendix A**.
- The Proposed Development: The proposed site infrastructure inclusive of all necessary infrastructure is shown on **Figure 1, Appendix A**.

1.1 PROJECT BACKGROUND

The Proposed Development is a substation and HVDC, and will consist of the following:

- Creation of a platform and the construction of a new outdoor Air Insulated Switchgear (AIS), 400 kilovolt (kV) substation complete with 400 kV double busbar arrangement;
- Creation of a platform and construction of a new 525 kV DC 2 gigawatt (GW) Bi-pole HVDC converter station;
- Installation of two new Super Grid Transformers (SGT) within noise enclosures;
- Installation of two new Synchronous Compensators (SYNCOMs);
- A new substation control building and two SYNCOM buildings;
- Sustainable Drainage Systems (SuDS) for drainage;
- Security fencing around the substation and converter station
- SuDS, foul water drainage and detention basins for drainage control;
- Realignment of the Achalone Tributary around the southern and eastern edges of the Site, with naturalization measures included to improve the realigned watercourse above its current condition;
- Access points at approximate grid references ND 15580 56484 (planned to be the principal Site access), and ND 15676 56250 (planned to be a temporary site access);
- Mounding for the purposes of visual screening;
- Cut and fill earthworks as required to enable the above; and
- Temporary construction compounds and material storage areas for the duration of the construction phase.

1.2 PLANNING AND POLICY CONTEXT

The Wildlife and Countryside Act 1981 provides protection to species and habitats and The Nature Conservation (Scotland) Act 2004 amends the Wildlife and Countryside Act 1981 in Scotland[1].

All wild birds receive general protection to their nest and eggs under the Wildlife and Countryside Act 1981, as amended by the Wildlife and Natural Environment (Scotland) Act 2011[2].

Some species receive enhanced statutory protection due to their listing in Schedule 1 of the Wildlife and Countryside Act 1981. It is an offence to disturb a Schedule 1 species while it is building a nest or is in, on, or near a nest containing eggs or young.

There are obligations within the Birds Directive 1979 relating both to protection of species and maintenance of habitats[3]. Birds on Annex 1 to the Birds Directive, regularly occurring migratory species, and birds on Schedule 1 to the Wildlife & Countryside Act are recognised in statute as requiring special conservation measures.

The Scottish Biodiversity List is a list of species and habitats of particular importance for the conservation of biodiversity in Scotland[4]. As part of their Biodiversity Duty, public bodies in Scotland are required to further the conservation of biodiversity and in particular to consider those species on the Scottish Biodiversity List.

In the United Kingdom, a number of bird species have been highlighted in non-statutory lists as priorities of Conservation Concern. This includes those listed in Birds of Conservation Concern 5 which was updated in 2024 with an addendum for breeding seabirds and assigns all birds according to three categories[5][6]:

- Red List Species - those birds whose populations or range is rapidly declining (recently or historically), and those of global conservation concern;
- Amber List Species - those birds whose populations are in moderate decline, rare breeders, internationally important and localized species and those of an unfavorable conservation status in Europe; and,
- Green List Species - those other birds occurring in the United Kingdom not included in the Red or Amber Lists above.

1.3 SITE DESCRIPTION

The Site is located approximately 2.4 km southeast of Halkirk, Caithness, Scotland, centered on an approximate Ordnance Survey National Grid Reference (OS NGR) ND 15950 56780.

[1] Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland) Act 2004
[2] Wildlife and Natural Environment (Scotland) Act 2011
[3] European Directive 2009/147/EC on the Conservation of Wild Birds (the 'Birds Directive')
[4] https://www.nature.scot/doc/scottish-biodiversity-list. Available online. (Accessed August 2024)
[5] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747
[6] Stanbury, A.J., Burns, F., Aebischer, N.J., Baker, H., Balmer, D.E., Brown, A., Dunn, T., Lindley, P., Murphy, M., Noble, D.G. and Owens, R., 2024. The status of the UK's breeding seabirds: an. British Birds, 117, pp.471-487.

The Site largely comprises of cattle and sheep pastureland, interspersed with areas of bog, heathland, and other acid and neutral grassland habitats, which are used for rough grazing. The site is bordered on parts of its east and south sides by coniferous plantation woodlands and on its western side by the A9.

The Site is intersected by numerous field drains, with the Burn of Halkirk comprising of the most substantial watercourse flowing through the north.

1.4 SURVEY AREA

The area surveyed was dependent on the specific survey being undertaken. Specific survey areas are set out under the appropriate methods sections below.

2. METHODS

2.1 SURVEY METHODS

Based on the location and nature of the Proposed Development and the desk-based review of available information, bird surveys were undertaken to inform the baseline environment for the Proposed Development: Results from bird surveys will also provide information for the proposed new Spittal – Loch Buidhe – Beauly OHL 400 kV, and so in some cases form part of wider survey effort, particularly in relation to flight activity surveys:

- Flight activity surveys;
- Breeding bird surveys; and
- Winter goose roost surveys.

The following sections set out the survey methods for each of these surveys, together with the approach taken to identify survey areas for each type of survey. Surveys were carried out by sub-consultants Atmos Consulting Limited.

2.1.1 FLIGHT ACTIVITY (VP) SURVEYS

Flight activity surveys from a vantage point (VP) were undertaken to characterize the use of the Proposed Development boundary and wider area by birds. The data collected provides an overview of bird usage and flight activity in relation to the Proposed Development boundary, helping inform assessment of potential disturbance and displacement, as well as identify areas where mitigation measures A single VP provided coverage of the Proposed Development site.

The VP survey methodology was based on NatureScot's guidelines on the assessment of onshore windfarms[7] and the assessment of impacts of power lines on birds[8].

Flight activity surveys were undertaken between May 2023 and April 2024. Over the 12 month survey period, at least 72 hours of VP survey was completed spread across 36 hours in the breeding season and 36 hours in the non-breeding season. Surveys were stratified across diurnal hours with a minimum of two watches at dawn (i.e., starting 0.5 hrs before sunrise -

[7] NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. (Accessed August 2024)
[8] NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. (Accessed August 2024)

one in autumn and one spring) and a minimum of two dusk watches (i.e., finishing 0.5 hrs after sunset - one in autumn and one spring), undertaken across the 12 month period.

Surveyors undertook static watches from one fixed location (VP1) and recorded flight activity of target species within that viewshed, comprised of species afforded additional conservation designations, and / or species of conservation concern. The viewshed from VP 1 covered 180 degrees. During each survey the viewshed was scanned using binoculars and a telescope, if required, until a target species was detected in flight. Once detected, the bird was followed until it ceased flying or was lost from view. The time the bird was first detected and duration of the flight, while in sight, was recorded on standardised VP recording forms. The flight line of the bird was then plotted on to a 1:25 000 scaled map in the field.

The position and viewshed of VP1 is shown in **Figure 1, Appendix A**.

2.1.1.1 TARGET SPECIES

Flight activity target species were informed by a review of qualifying feature species of designated sites within relevant connectivity distances as well as known distributions of other sensitive species and comprised the following groups / species:

- All S1-listed raptors[9];
- All owls;
- All divers (*Gavia spp*.);
- All geese[10];
- All terns;
- All skuas;
- All waders;
- All ducks;
- All grebes;
- Capercaillie (*Tetrao urogallus*); and
- Black grouse (*Tetrao tetrix*).

2.1.1.2 SECONDARY SPECIES

Flight activity secondary species comprised:

- All egrets;
- All gulls;
- Sparrowhawk (*Accipiter nisus*);
- Kestrel (*Falco tinnunculus*);
- Buzzard (*Buteo buteo*);
- Raven (*Corvus corax*);
- Grey heron (*Ardea cinerea*); and
- Cormorant (Phalacrocorax carbo).

[9] Wildlife & Countryside Act (1981) as amended (Accessed August 2024)
[10] Except for Canada geese (*Branta canadensis*).

Target species flight height was estimated at the time of detection and at 15 second intervals thereafter until the bird(s) was lost from view or left the viewshed. Changes between height bands during flights were marked on the map. Flights were categorised into three height bands; A (0-5 m); B (>5 to 70 m); and C (>70 m). If multiple flights occurred together, the movement of the target species was prioritised over that of secondary species.

Passerine flights were not mapped, but movements of large groups of notable birds, i.e., Red Listed Birds of Conservation Concern were recorded[56].

2.1.2 BREEDING BIRD WALKOVER SURVEYS

Breeding Bird Survey (BBS) visits were undertaken between May 2023 and early August 2023.

The survey approach was based on a modified Brown and Shepherd walkover method[11]. The overall approach to the Breeding Bird Surveys was informed by NS guidance on surveys for power lines and onshore wind farm developments[12].

Three visits were completed covering the proposed substation location and 500m buffer.

The walkover survey encompassed all habitats, with particular focus on those which may be of potential ornithological importance and of higher bird density.

Surveys avoided adverse weather conditions (i.e., high winds and constant rain). The methodology is based on a constant search effort, allowing 20 to 25 minutes per 500 x 500 m quadrat of open land. A predetermined route through each quadrat was followed so that all areas of each quadrat were approached to within at least 100 m, with the surveys taking place between 08:30 and 18:00, in accordance with guidance.

The behaviour and location of each individual bird was recorded on a 1:25,000 scale map, using standard BTO codes. Records from each survey were combined into a final visit map, so that duplicate records of the same birds could be removed.

The number and indicative location of likely bird territories was estimated by grouping species registrations from the two / three survey visits to produce a breeding bird territory map. Birds flying over the site, species suspected to be on migration, or suspected to be summering non-breeders, were categorised as non-breeding.

The breeding bird survey area is shown in **Figure 1, Appendix A**.

2.1.3 WINTERING GOOSE SURVEYS

Winter goose roost surveys were undertaken at two waterbodies within 2 km of the Proposed Development, due to their potential suitability as overnight roosts for wintering geese and swans. The waterbodies were a flooded quarry pond at Spittal Mains, and a lochan southeast of Banniskirk Mains. The surveys aimed to identify overnight roosting sites used by geese and swans and commuting flight paths to these sites. Initial surveys at Spittal Main Quarry identified that the site was unsuitable as a roost, and survey focus switched to the waterbody at Banniskirk Mains.

[11] Brown, A. F. and Shepherd, K. B. (1993). *A method for censusing upland breeding waders*. Bird Study, 40, pp. 189-195

[12] NatureScot (2017). *Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms*. Version 2. Guidance

Surveys were undertaken once per month from November 2023 - February 2024, with surveys following best practice methods and commenced at either dusk or dawn[13]. Dawn observations at each potential roost site started at least 0.5 hours before sunrise and ended 1 hour after sunrise. Dusk observations at each waterbody started at least 1.5 hours before sunset and ended 0.5 hours after sunset.

The wintering goose Survey Area is shown in Figure 1.

Targeted goose foraging surveys were also undertaken as part of the Spittal – Loch Buidhe – Beauly OHL 400 kV project, targeting areas of goose foraging identified in Mitchel et al (2012). The closest area for targeted surveys was located approximately 750m northeast of the Proposed Development. The need for Targeted goose foraging surveys for the Proposed Development were screened out based on the habitat present on site (the site largely comprises of cattle and sheep pastureland), the lack of localized goose foraging records[14] for the Proposed Development location, and wider the coverage of the Proposed Development provided from the flight activity and goose roost surveys. The wintering goose survey area is shown in **Figure 1, Appendix A.**

2.2 SURVEY INFORMATION

Flight activity, breeding bird and wintering goose surveys were all undertaken by Atmos Consulting Ltd.

2.3 SURVEY LIMITATIONS

Due to the project programme and land access limitations, breeding bird surveys in 2023 did not commence until May 2023. Given the nature of the site and the type of breeding bird assemblage recorded, this is not considered to be a significant limitation.

3. RESULTS

3.1.1 FLIGHT ACTIVITY SURVEYS

Data from VP surveys recorded flight activity by the following five species over at least part of the Proposed Development:

- Herring gull (*Larus argentatus*) – on 20th February, 9 birds flew east to west, through the centre of the Site, over the location of the planned substation at height band B;
- Common gull (*Larus canus*) – three fights:
  - On 7th March, a single bird flew through the southern corner of the Site within height band B, in a westerly direction; and,
  - On 10th April, 12 birds entered the north east corner of the Site and circled above the location of the proposed substation at height band B before heading off in an easterly direction;
  - On 14th September, 4 birds flew across the northeastern boundary of the Proposed Development, before heading east;
- Greylag goose (*Anser anser*) – two fights:

[13] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods.* RSPB
[14] Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

- On 10th April at approximately 08:41, two birds flew east to west, through the centre of the Site, over the location of the planned substation, within height band B; and,
- On 10th April at approximately 09:25, three birds entered the Site from the south east corner and flew over the location of the planned substation, within height band C, in a westerly direction;

- Pink-footed goose (*Anser brachyrhynchus*) – three flights
  - on 10th April, 80 birds flew over the Site from the south west corner and flew in a northeasterly direction over the location of the planned substation, within height band B;
  - on 1st November, 250 birds flew across the Proposed Development site from the southeast, passing over the site and heading to the northwest at height band C; and,
  - on 29th November 25 birds flew across the north eastern edge of the Proposed Development from the southeast, at height band C.
  - In addition, on 29th November, 12 unidentified geese (likely to be greylang or pink-footed geese) were also recorded passing over the site in a north westerly direction at height band C.
- Golden eagle (*Aquila chrysaetos*) – on 23rd April, a single bird circled over the south east corner of the Site, within height band B, then turned and headed back in the easterly direction from which it came.

Flight activity survey results from 2023 are shown in **Figure 2a, Appendix A.**

Flight activity survey results from 2024 are shown in **Figure 2b, Appendix A.**

3.1.2 BREEDING BIRD SURVEYS

A total of 21 species were recorded within the Survey Area as confirmed (CO), probable (PR) or possible (PO) breeding species during site surveys.

Results are presented in Table 3.2. and the location of the records are presented in **Figure 3, Appendix A.**

TABLE 3.2 BREEDING BIRD SPECIES RECORDED AS CONFIRMED / PROBABLE / POSSIBLE BREEDERS WITHIN 2 KM OF THE PROPOSED DEVELOPMENT

Species	Number of territories 2023			Conservation status
	CO	PR	PO	
Blackbird (*Turdus merula*)			2	BoCC green list
Blackcap (*Sylvia atricapilla*)			2	BoCC green list
Blue tit (*Cyanistes caeruleus*)			1	BoCC green list
Buzzard (*Buteo buteo*)		2		BoCC green list
Carrion crow (*Corvus corone*)			1	BoCC green list
Chaffinch (*Fringilla Coelebs*)			4	BoCC green list
Coal tit (*Periparus ater*)			1	BoCC green list
Curlew (*Numenius Arquata*)		1	2	SBL

Species	Number of territories 2023			Conservation status
				BoCC red list
Goldfinch (*Carduelis carduelis*)			1	BoCC green list
Great tit (*Parus major*)			1	BoCC green list
Greenfinch (*Chloris chloris*)			2	BoCC red list
Lapwing (*Vanellus vanellus*)			1	SBL BoCC red list
Long-tailed tit (*Aegithalos Caudatus*)			1	BoCC green list
Meadow pipit (*Anthus pratensis*)		3	8	BoCC amber list
Pheasant (*Phasianus colchicus*)			1	Not assessed
Robin (*Erithacus rubecula*)				BoCC green list
Skylark (*Alauda Arvensis*)		1	3	SBL BoCC red list
Siskin (*Spinus spinus*)			2	SBL BoCC green list
Swallow (*Hirundo rustica*)			1	BoCC green list
Woodpigeon (*Columba Palumbus*)			1	BoCC amber list
Willow warbler (*Phylloscopus trochilus*)			1	BoCC amber list

Key: CO – Confirmed. PR – Probable. PO – Possible. BoCC – Birds of Conservation Concern. SBL – Scottish Biodiversity List.

An additional 12 non-breeding species were recorded during the BBS visits. Of these, two and three species are red and amber BoCC listed, respectively, and two are on the SBL

3.1.3 WINTER GOOSE ROOST

No roosting or loafing geese were recorded on either waterbody within 2 km of the Proposed Development during winter goose roost surveys. However a flock of 30 whooper swans was recorded on the loch south east of Banniskirk mains, approximately 1.1. km east of the Proposed Development, during flight activity surveys in September. Flocks of un-identified swans of up to 18 birds were recorded during March and April. Flocks of mute swans were recorded, with a flock of 50 birds recorded in September, and five birds in April.

No geese were recorded foraging on or within 500m of the Proposed Development site, or commuting from known roosts to forage on the Proposed Development site.

Winter goose flight activity survey results from 2023 and 2024 are shown in **Figure 4, Appendix A.**

Foraging goose surveys were undertaken across arable fields to the south and east of the Proposed Development as part of surveys for the proposed Spittal – Loch Buidhe – Beauly OHL 400 kV, with the nearest record of foraging geese approximately 3 km east of the Proposed Development.

APPENDIX A FIGURES

FIGURE 1 SITE BOUNDARY PLAN, DEVELOPMENT PLAN AND BIRD SURVEY AREAS

FIGURE 2a FLIGHT ACTIVITY SURVEY RESULTS 2023

FIGURE 2b FLIGHT ACTIVITY SURVEY RESULTS 2024

FIGURE 3 BREEDING BIRD SURVEY RESULTS

FIGURE 4 WINTER GOOSE SURVEY FLIGHT LINES

Site Boundary

Proposed Site Infrastructure

Proposed Permanent Works

Study Areas

Breeding Bird Survey Area [500 m Buffer of Site Boundary]

Flight Activity Survey Area [2 km Buffer of Site Boundary]

Vantage Point Locations

VP 1

Viewsheds

VP1 & Winter Goose Roost VP

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Kilometers

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Annex Figure 1
Bird Survey Areas, Vantage Point 1 and Viewshed

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Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

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Site Boundary

Proposed Permanent Works

Flight Activity Survey Area [2 km Buffer of Site Boundary]

Flight Activity Species

- CM
- GB
- HG
- HH
- ML
- OP
- UF

Registrations within 2km

- CM
- MS
- WS

Species Code	Species Name
CM	Common Gull
GB	Great Black-backed
HG	Herring Gull
HH	Hen Harrier
ML	Merlin
MS	Mute Swan
OP	Osprey
UF	Unidentified Yellow-billed Swan
WS	Whooper Swan

0 0.2 0.4 0.6 0.8 1

Kilometers

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Annex Figure 2a
Flight Activity Survey Results
May - December 2023

ERM

Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

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Site Boundary

Proposed Permanent Works

Flight Activity Survey Area [2 km Buffer of Site Boundary]

Flight Activity Species

- CM
- EA
- GB
- GP
- HG
- KT
- MS
- OC
- SE
- UF

Registrations within 2km

- CM
- CU
- L.
- MS
- UF
- WN

Species Code	Species Name
CM	Common Gull
CU	Curlew
EA	Golden Eagle
GB	Great Black-backed
GP	Golden Plover
HG	Herring Gull
KT	Red Kite
L.	Lapwing
MS	Mute Swan
OC	Oystercatcher
SE	Short-eared Owl
UF	Unidentified Yellow-billed Swan
WN	Wigeon

0 0.2 0.4 0.6 0.8 1
Kilometers

N

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SIZE: A3	DRAWN: CR
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DATE: 20/11/2024	APPROVED: KG

Annex Figure 2b
Flight Activity Survey Results 2024

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Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

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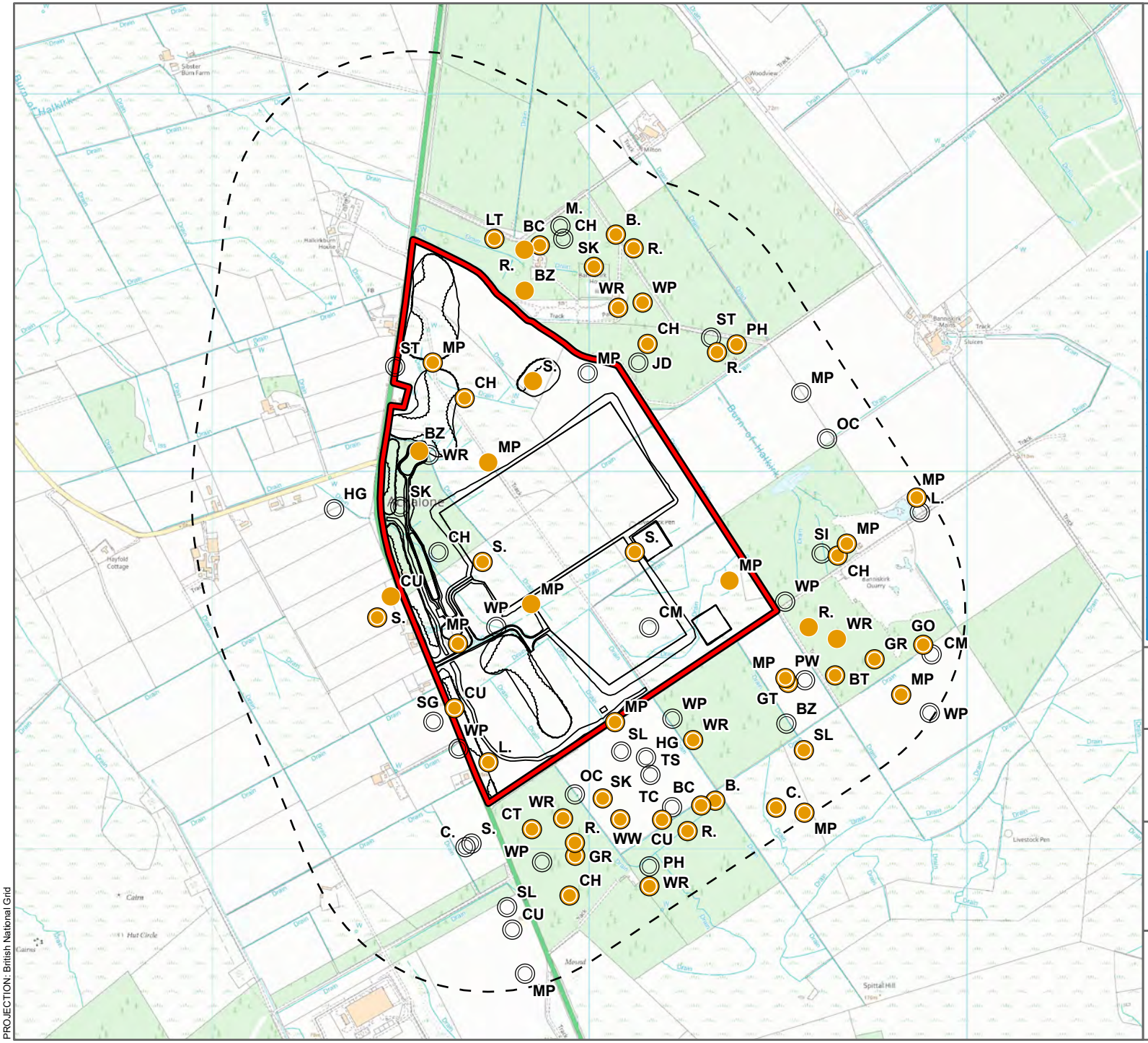

Site Boundary

Proposed Infrustructure

Proposed Permanent Works

Breeding Bird Survy Area [500 m Buffer of Site Boundary]

Breeding Bird Survey Status

- Non-breeding
- Possible
- Probable

Species	Name
B.	Blackbird
BC	Blackcap
BT	Blue Tit
BZ	Buzzard
C.	Carrion Crow
CH	Chaffinch
CM	Common Gull
CT	Coal Tit
CU	Curlew
GO	Goldfinch
GR	Greenfinch
GT	Great Tit
HG	Herring Gull
JD	Jackdaw
L.	Lapwing
LT	Long-tailed Tit
M.	Mistle Thrush

Species	Name
MP	Meadow Pipit
OC	Oystercatcher
PH	Pheasant
PW	Pied Wagtail
R.	Robin
S.	Skylark
SG	Starling
SI	Swift
SK	Siskin
SL	Swallow
ST	Song Thrush
TC	Treecreeper
TS	Tree Sparrow
WP	Woodpigeon
WR	Wren
WW	Willow Warbler

0 100 200 300 400 500

Metres

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Annex Figure 3
Breeding Bird Survey

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Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

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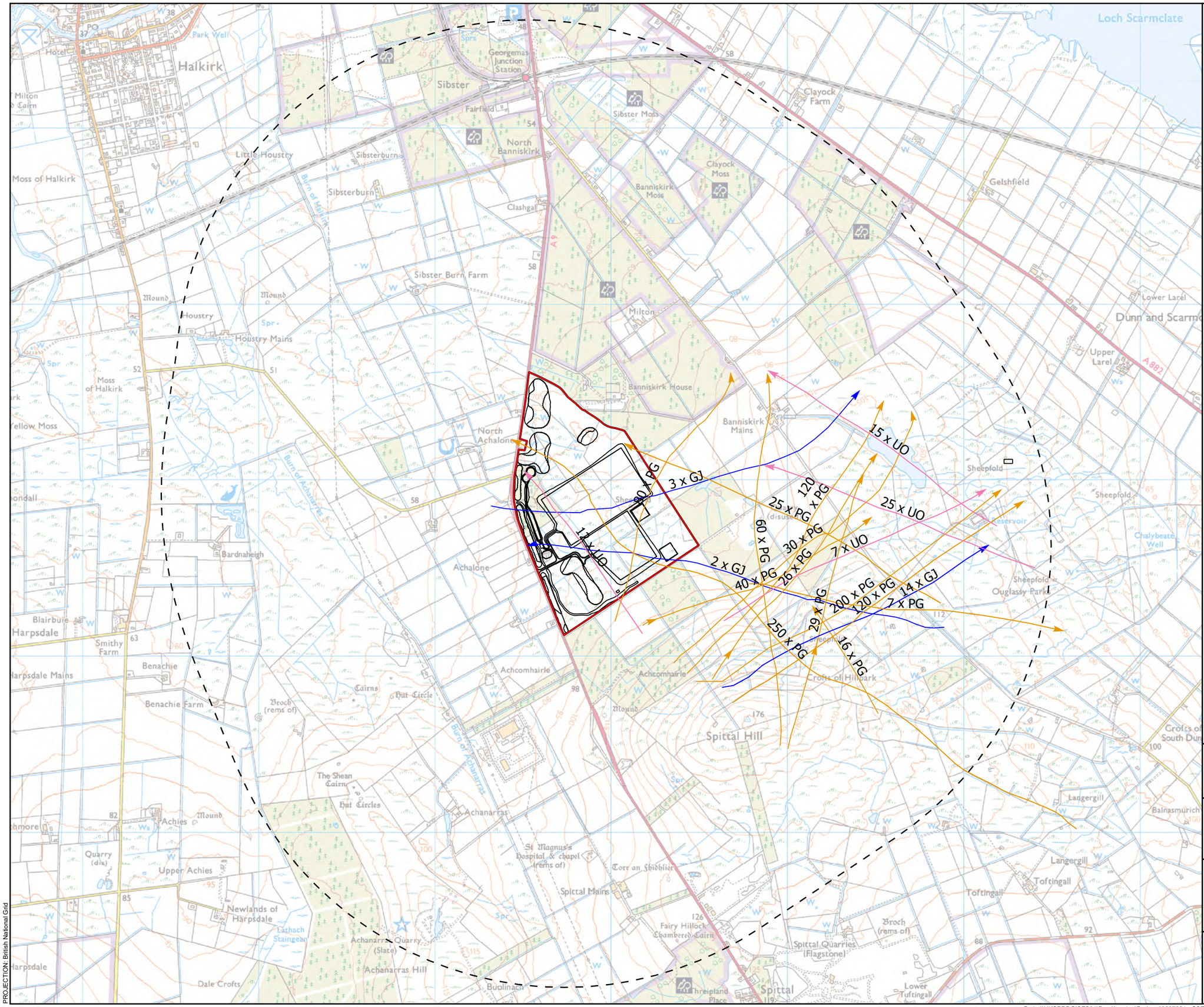

Species Code	Species Name
GJ	Greylag Goose
PG	Pink-footed Goose
UO	Unidentified Goose

Site Boundary

Proposed Site Infrastructure

Proposed Permanent Works

Flight Activity Survey Area [2 km Buffer of Site Boundary]

Winter Goose Species

GJ

PG

UO

0 0.2 0.4 0.6 0.8 1

Kilometers

N

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PROJECT: 0697221	CHECKED: DN
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Annex Figure 4
Winter Goose Roost Survey Flight Lines

ERM

Scottish & Southern Electricity Networks TRANSMISSION

PROJECTION: British National Grid

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