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HAGSHAW ENERGY CLUSTER – WESTERN EXTENSION – Phase 1

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Contents

Document Information	2
Contents	3
1. Introduction	5
1.1 Overview	5
1.2 Site Description	5
2. Aims	5
3. Legislation and Biodiversity	6
3.1 Legislation	6
3.2 Biodiversity	7
3.3 Birds of Conservation Concern	8
4. Methods	9
4.1 Overview	9
4.2 Desk Study	9
4.3 Field Surveys	9
5. Baseline	13
5.1 Desk Study	13
5.2 Field Surveys	15
5.3 Species Accounts – Northern Development Area	16
5.4 Species Accounts – Southern Development Area	19
References	21
Annex A: Survey Data Summary	22
Flight Data (N Development Only) – SPA qualifying species	30
Flight Data – Other species	30
Annex B: Breeding bird survey results	34

Figures

- TA6.1 Figure 1 – Non SPA Schedule 1 Raptor and Wader Flightlines – N Development
- TA6.1 Figure 2 – Wildfowl Flightlines N Development
- TA6.1 Figure 3 – Other Species Flightlines S Development
- TA6.1 Figure 4 – BBS Territories - N Development

TA6.1 Figure 5 – BBS Territories - S Development 2021

TA6.1 Figure 6 – BBS Territories - S Development 2022

TA6.1 Figure 7 – BBS Territories - S Development 2023

CONFIDENTIAL ANNEX (contained in EIA Report Volume 5)

TA6.1 CONFIDENTIAL ANNEX Figure1 – Flightlines Northern Development Area- SPA Species

TA6.1 CONFIDENTIAL ANNEX Figure2 – Flightlines Southern Development Area- SPA Species

TA6.1 CONFIDENTIAL ANNEX Figure3 – Breeding Raptor Breeding Locations

TA6.1 CONFIDENTIAL ANNEX Figure4 – Hen Harrier – Desk Study Historical Records

TA6.1 CONFIDENTIAL ANNEX Figure5 – Peregrine, Merlin and Short-Eared Owl – Desk Study Historical Records

1. Introduction

1.1 Overview

ITPnergised (now SLR) was appointed by 3R Energy to undertake a suite of ornithological surveys in support of a proposed renewable energy development north of Muirkirk. The original site encompassed an area of open land which was extended to include a section of plantation forestry. This original area (the 'Wider Site') was modified meaning the open area of land has been put on hold leaving the area of forestry which is proposed as a wind farm (the 'Northern Development Area') and a strip of farmland proposed for use as a solar farm and associated energy storage (the 'Southern Development Area').

The two areas (hereafter referred to as the 'Site') are known as the Hagshaw Energy Cluster - Western Expansion | Phase 1 (hereafter referred to as the 'Proposed Development') which forms the baseline study area of this report.

Figures illustrating the findings of the surveys and desk study work undertaken to support the assessment of ornithological effects from the Proposed Development are provided as:

- Technical Appendix 6.1 Figures 1 to 7; and
- Technical Appendix 6.1 Confidential Annex Figures 1 to 5 (these figures are confidential and therefore not included in the main Technical Appendix figures).

1.2 Site Description

The Proposed Development is split into two main development areas as noted above, with the wind turbines and alternative substation and Battery Energy Storage System (BESS) located within the Northern Development Area (Dungavel Forest), and the solar, BESS and substation located within the Southern Development Area (Netherwood) - refer to **Chapter 3** (EIA Report Volume 1).

The Northern Development Area is located within the western part of Dungavel Forest, directly to the west and south of the operational Dungavel and Kype Muir Extension Wind Farms, within South Lanarkshire. The Southern Development Area is located on the Netherwood landholding, approximately 1.4 km at its closest point to the north of Muirkirk in East Ayrshire. The two development areas are connected by a road corridor along the B743.

The Northern Development Area mainly comprises commercial coniferous plantation and existing forestry tracks. The Southern Development Area comprises rough grassland principally used for silage and grazing cattle and sheep, with woodland fringes.

More information on the Site and Proposed Development is given in **Chapter 3** (EIA Report Volume 1).

2. Aims

This report presents the ornithological survey work undertaken in support of the Proposed Development by ITPnergised (now SLR) between April 2021 and March 2024.

Collectively, the objectives of the surveys were to:

- Map the distribution of breeding birds, including scarce and priority species;
- Record the presence and abundance of birds considered to be of a conservation priority; and
- Quantify the level of flight activity by birds of potential conservation importance.

3. Legislation and Biodiversity

3.1 Legislation

All relevant legislation and guidance documents have been considered as part of this baseline assessment, as referenced in this report (a summary of pertinent nature conservation legislation is presented below).

Of particular relevance are:

- Council Directive 2009/147/EC on the conservation of wild birds (the Birds Directive) ¹;
- The Ramsar Convention on Wetlands 1976;
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive);
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended); and
- The Nature Conservation (Scotland) Act 2004 (as amended), which places a statutory duty on all public bodies to further the conservation of biodiversity through the Scottish Biodiversity Strategy, with Scottish priority species and habitats listed on the Scottish Biodiversity List (SBL), itself based on the former UK Biodiversity Action Plan (UKBAP), and regional biodiversity targets defined through a Local Biodiversity Action Plan (LBAP). The LBAPs of relevance to this report are the South Lanarkshire Biodiversity Strategy and East Ayrshire LBAPs, due to the Proposed Development boundary overlying two different Local Authority Regions.

3.1.1 International Conventions and Directives

3.1.1.1 The Birds Directive (2009/147/EC)

The European Union (EU) Directive on the Conservation of Wild Birds (2009/147/EC) was first adopted in 1979 and is the primary mechanism for delivering the EU's obligations under the Convention on Biological Diversity (CBD), and the Ramsar and Bonn Conventions. Collectively, the Birds and Habitats Directives require Member States to take action in order to protect all bird species and their habitats which includes the designation of Special Protection Areas (SPAs) in respect to species listed on Annex I of the Directive.

3.1.1.2 Ramsar Convention on Wetlands

The Convention on Wetlands of International Importance (the Ramsar Convention) was adopted in Iran in February 1971 and came into force in the UK in May 1976. The Convention considers the subject area of wetland conservation and comprises three elements of activity:

- The designation of wetlands of international importance as Ramsar sites;
- The promotion of the sustainable use of all wetlands in the territory of each country; and
- International co-operation with other countries to further the sustainable use of wetlands and their resource.

3.1.1.3 The Habitats Regulations

In Scotland, the Habitats Directive is translated into specific legal obligations by the Conservation (Natural Habitats, &c.) Regulations 1994. This piece of legislation is usually known as the Habitats Regulations.

¹ Although the UK has now left the European Union, there has been no significant change in the wording of UK nature conservation legislation based on European Directives, and these are therefore considered to remain relevant to the present report.

In relation to ornithological interests, the Habitats Regulations cover the requirements for Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which are sites that are internationally important for threatened habitats and species; making a network of sites designated as together known as Natura2000 network.

3.1.1.4 The Convention on Biological Diversity (CBD)

The CBD was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992, and came into force in December 1993. It was the first global treaty to provide a legal framework for biodiversity conservation. The treaty has three primary goals:

- The conservation of biological diversity;
- The sustainable use of its components; and
- The fair and equitable sharing of the benefits arising from the use of genetic resources.

Signatories are required to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity.

The UK Government ratified the convention and published the UKBAP in 1994 and to compliment the UKBAP, separate biodiversity strategies for each of the devolved governments have been subsequently developed, including the Scottish Biodiversity Strategy, launched in 2004.

3.1.2 National Legislation

3.1.2.1 The Wildlife and Countryside Act

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principal mechanism for wildlife protection in the UK. Schedule 1 of the Act lists bird species that are afforded special protection. The principal designation established under the Act is the citation of Sites of Special Scientific Interest (SSSI).

The Act also makes it an offence (with exception to species listed in Schedule 2) to intentionally:

- Kill, injure, or take any wild bird;
- Take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- Take or destroy an egg of any wild bird.

3.2 Biodiversity

3.2.1 Biodiversity Duty Report

Under the Nature Conservation (Scotland) Act 2004, all public bodies are required to further the conservation of biodiversity when carrying out their public responsibilities and duties. Following an amendment to the Wildlife and Natural Environment (Scotland) Act 2011, public bodies are required to publish a publicly available report on the actions they have taken to meet this biodiversity duty.

3.2.2 Scottish Biodiversity List

Scottish Ministers created the SBL in 2005 in order to satisfy the requirements under Section 2(4) of the Nature Conservation (Scotland) Act 2004 and to assist public bodies in carrying out conservation of biodiversity, and to provide the general public with information regarding conservation within Scotland. The list contains habitats, plants and species which are deemed to be of principal importance to the Scottish population and meet the social and scientific criteria. This report focuses on the scientific value of the SBL entries.

Species details, including a list of scientific criteria and reasoning for inclusion to the list, can be located within the Scottish Biodiversity List: Technical Report (Scottish Government, 2013).

3.2.3 The East Ayrshire Biodiversity Action Plan

The first Ayrshire Local Biodiversity Action Plan was produced in 2001 with a further revision in 2007. This whole Ayrshire wide report was looked at again in 2011 but with the challenges each local authority faced an Ayrshire wide partnership fell through. The first East Ayrshire Biodiversity Delivery Plan was published and covered the period 2015-17 and was revised for the period 2018-20.

Last discussed in 2020 there are no plans to produce an East Ayrshire Local Biodiversity Action Plan (LBAP) until guidance is produced on a national level to guide the process. However, there are a number of key priorities that will be implemented and taken forward between 2021 and 2023 (East Ayrshire Council, 2020).

These include:

- Implementation of the Coalfield Communities Landscape Partnership;
- Implementation of Dean Castle Country Park Habitat and Biodiversity Action Plans;
- Updated green space audit and a revised Green Infrastructure Strategy;
- Provide support to Community Led Action Plans;
- Continue to identify opportunities to work with new partners and develop; and
- new initiatives to raise awareness of biodiversity across East Ayrshire.

3.2.4 The South Lanarkshire Biodiversity Strategy

The South Lanarkshire Biodiversity Strategy was first created in 1997 while the most recent version covers the period 2018 – 2022. The new strategy has *“coignisance of developments related to biodiversity at a national and local level including national priority habitat mapping, a revised Scottish Priority species List, a greater emphasis on geodiversity, peatland conservation and the control of invasive non-native species”* South Lanarkshire Council (2018).

The strategy identifies six ecosystems which are of the greatest importance of which the following are relevant to the Site:

- Freshwater;
- Lowland and Farmland;
- Peatland;
- Upland; and
- Woodland.

While the sixth, urban is not considered relevant. The strategy does not outline specific priority LBAP species.

3.3 Birds of Conservation Concern

The Birds of Conservation Concern (BoCC) is a report collaborated between the Statutory Nature Conservation Bodies (SNCBs), Royal Society for the Protection of Birds (RSPB), British trust for Ornithology (BTO), Wildfowl and Wetlands Trust (WWT), Game and Wildlife Conservation Trust (GWCT) and several other organisations. It uses an approach based on quantitative assessments against standardised criteria, in order to place individual bird species on 'Red', 'Amber' or 'Green' lists to indicate different levels of conservation concern. Red in the context of BoCC is not the same as IUCN's Red List, though IUCN status is one of the criteria used in BoCC assessment. Collectively, the changes in the numbers and proportions of species on Red, Amber or Green lists provide a gauge of the broad direction of status of UK birds and point to the degree of threat they face, as well as the efficacy of conservation measures taken (Stanbury *et al.*, 2021).

Birds on the Red and Amber lists are subject to at least one of the factors listed below:

- Red - red list species are those that are globally threatened, have had an historical population decline in the UK from 1800 -1995, a rapid (> or = 50%) decline in UK breeding population over the past 25 years, or a rapid (> or = 50%) contraction of UK breeding range over the past 25 years;
- Amber - amber listed species have had a historical population decline from 1800-1995 but are recovering; population size has more than doubled over the past 25 years, a moderate (25-49%) decline in UK breeding population over the past 25 years, a moderate (25-49%) contraction of UK breeding range over the past 25 years, a moderate (25-49%) decline in UK non-breeding population over the past 25 years, or species with unfavourable conservation status in Europe also known as Species of European Conservation Concern (SPEC); and
- Green - green listed species have no identified threat to their population status.

4. Methods

4.1 Overview

This section describes the methods used for the ornithological surveys, which comprised a combination of desk study and field survey. Fields surveys were completed of a wider area, however only those relevant to the Proposed Development are discussed below.

4.2 Desk Study

An ornithological desk study was undertaken to compile existing baseline data for the Site and local area.

In terms of nature conservation designations of relevance to birds, the desk study aimed to identify international designations such as SPAs and Ramsar wetlands within 10 km of the Site boundary, although this is extended to 20 km for SPAs with goose and/or swan qualifying features. National statutory designations, such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) were identified within 5km of the Site boundary.

Only ornithological features are considered relevant to the present study. Any Local Nature Conservation Sites (LNCSSs) or non-statutory designations, such as Local Biodiversity Sites, were identified within a 2km distance of the Site boundary. Existing records that are freely available for commercial use of protected or otherwise notable species (e.g. SBL/LBAP priority species) will be identified as part of a full desk study within a 2km distance of the Site boundary. Records from the last 10 years were considered relevant to the study.

Data for priority / notable species and designated sites will be obtained from the following databases:

- National Biodiversity Network (NBN) Atlas;
- NatureScot (NS), formerly Scottish Natural Heritage (SNH), SiteLink website;
- Scotland's Environment Interactive Map; and
- MAGIC: Nature on the Map.

The Local Record Centre(s) will be contacted at the end of the survey period to provide further historical records of relevance for ornithology species within 2km of the site boundary.

4.3 Field Surveys

4.3.1 Determination and Selection of Vantage Points

Pre-scoping consultation with NS, combined with the results of the desk study, identified that Vantage Point (VP) surveys would be required to account for the potential presence of 'scarce' diurnal raptors, waterfowl and wading bird species within and adjacent to the Site.

Initially a total of eight VP's (VPs 1-8) were established in the open areas of the Wider Site in April 2021, the results of seven of eight VP's (VP3 overlaps the Southern Development Area) are not directly relevant to the Phase 1 development and will be mentioned only as a summary of results. Three additional VP's (VP 9-11) which covered the majority of the Northern Development Area were established and added in March 2022, with a fourth VP (VP12) being added in March 2023 following an extension of the proposed turbine area. Only the results from VP3 (overlapping the solar array) and VP9-12 (overlapping the wind array) are considered directly relevant to the Phase 1 development and are discussed below.

The VP locations and the corresponding viewsheds were verified during a site visit in April 2022 for VP9 – VP11 and April 2023 for VP12. VP locations and bearings are provided in Table 1 and Table 2 and shown in **Figure 6.1** (EIA Report Volume 2).

Table 1 - VP Locations and Orientation -Northern Development Area

VP	Grid Reference	Bearing Year2
VP9	NS 70485 35517	15°
VP10	NS 67616 35450	225°
VP11	NS 67062 33733	90°
VP12	NS 67321 35295	315°

Table 2 - VP Locations and Orientation -Southern Development Area

VP	Grid Reference	Bearing Year2
VP3	NS 67995 28764	0°

4.3.2 Diurnal Vantage Point Surveys

As mentioned above surveys at the Wider Site commenced in April 2021 and then at the Northern Development Site in April 2022, during which Information on bird flight activity was collected throughout timed watches using recommended guidance and methods as outlined by NS, (SNH, 2017). To date, a total of two years of data has been gathered (with the exception of VP12 where one full year was completed) in order to support a future Ecological Impact Assessment (EclA) for the Proposed Development. Surveyors undertook the surveys in such a way as to minimise the potential for disturbance impacts on bird behaviour associated with their presence near the Site, including arriving at the survey point a minimum of 15 minutes prior to the commencement of each VP watch.

All surveys were stratified, where possible, across three daylight periods (termed 'dawn', 'day' and 'dusk') to allow for diurnal variation in activity rates. All surveys comprised watches lasting no more than three hours in duration and a minimum of 30 minutes break was observed by the surveyor between subsequent watches.

All surveys were undertaken by a single observer in a wide range of weather conditions, but mainly in conditions of good ground visibility (> 2 km) and timings were adjusted to account for changes in sunrise and sunset times within each survey season.

During each VP watch, two methods of recording were used comprising focal sampling of target species and activity summaries of secondary species. Observations were recorded using eight different height bands in order to allow for multiple potential turbine specifications, the height bands will be merged together once a finalised specification has been selected. The height bands used were:

- HB1: < 20 m;
- HB2: 20 ≥ < 40 m;
- HB3: 40 ≥ < 80 m;

- HB4: $80 \geq < 230$ m; and
- HB5: ≥ 230 m

Flightline data were noted in the field onto recording sheets and later transferred to a Microsoft Excel spreadsheet for analysis. Each flightline recorded during each VP watch was annotated on to a survey map and cross-referenced to its corresponding data entry on the recording sheet.

The total number of survey hours between April 2021 and March 2024 at each VP location comprised:

- VP 3, 9-11 – 144 hours at each VP;
- VP 12 – 72 hours.

Full details of the survey dates and timings are shown in Annex A: Table A1.

4.3.3 Breeding Bird Walkover Surveys

A Brown and Shepherd (1993) survey method, which is designed for moorland/upland habitats, was followed for the open areas of the Wider Site as part of the breeding bird survey, including all or part of the Southern Development Area in 2021, 2022 and 2023 and open sections of the Northern Development Area in both 2022 and 2023.

NatureScot guidance (SNH, 2017) recommends that this survey follows a four-visit approach, carried out between April to July, with a minimum of two weeks between survey visits. A walked transect was followed, visiting all the areas of suitable habitat within the survey area aiming to survey for birds within 100m of all points inside the survey areas. Within visits, duplicate records of waders separated by less than a threshold distance of 500 m were considered to correspond to birds of the same pair, while those separated by more than the threshold distance were considered to be from different pairs. Exceptions to this occurred when recorded birds seen within the threshold distance of each other as definitely representing different pairs.

Breeding bird surveys are not considered to be a requirement within forestry unless significant populations of sensitive Schedule 1 passerine species, such as crossbill (*Loxia curvirostra*), are present. Given the presence of a population of crossbill, and to get a good overview of the breeding assemblage within the commercial plantation, a breeding bird survey was completed, walking transects through all accessible rides, forest edges and open areas within the plantation woodland of the Northern Development Area. The survey of Dungavel forest was completed in 2023.

The survey areas between years were modified as the site boundary changed, including the current site boundary at time of survey plus a 500 m buffer around the where access permitted.

Following the four visits, all survey data are considered together, along with the noted behaviour observed, and territories of breeding birds are defined as either; confirmed, probable, possible or non-breeding.

Survey visits took place of the Wider Site during the 2021 breeding season on:

- Survey visit 1 – 24th, 25th May, 1st, 2nd, 9th, 16th and 17th June;
- Survey visit 2 – 12th, 15th, 17th, 19th, 23, 29th and 30th June;
- Survey visit 3 – 1st, 8th, 9th, 16th and 17th July; and
- Survey visit 4 – 21st, 30th July, 3rd, 5th, 10th and 12th August.

Survey visits took place of the Wider Site during the 2022 breeding season on:

- Survey visit 1 – 3rd, 4th, 5th, 7th, 8th, 20th, 21st, 24th, 25th, 26th and 28th April;
- Survey visit 2 – 8th, 9th, 10th, 17th, 18th, 19th May;
- Survey visit 3 – 5th, 6th, 7th, 15th, 16th, 22nd, 24th, 29th June; and
- Survey visit 4 – 1st, 2nd, 3rd, 4th, 7th, 15th, 20th July.

Surveys of the Northern and Southern Development Areas during the 2023 breeding season on:

- Survey visit 1 – 7th (2 surveyors), 8th April;
- Survey visit 2 – 9th, 13th, 14th May;
- Survey visit 3 – 20th, 21st (2 surveyors) June; and
- Survey visit 4 – 9th, 10th, 21st July.

4.3.4 Breeding Raptor Survey

Surveys for breeding raptors were completed following methods as described in Hardey *et al.* (2013). A four-visit walkover survey approach was used, with survey visits being timed between April and July 2022 and April and July 2023. The survey area is continuously scanned for target species during the walkover. This includes stops at “mini” vantage points where the view is scanned for a period (usually 15-20 minutes) across suitable habitat for target species. Surveys for breeding moorland raptors generally require four visits between April and August.

The surveys were conducted by the SSRS and covered the wider Site and a 2 km survey buffer in both 2022 and 2023 (the ‘Breeding Raptor Survey Area’) meaning coverage of both Northern and Southern Development Areas and 2 km survey buffer were included as part of the survey. The first survey visit is primarily to detect displaying birds and/or territory occupancy by the various target species. A second visit is then used to identify active nests. The third visit is then carried out to check for the presence of young birds, and the final fourth visit is used to record fledged young.

Survey visits took place during the 2021 breeding season on:

- Survey visit 1 – 9th, 10th and 12th April;
- Survey visit 2 – 11th, 12th and 14th May;
- Survey visit 3 – 26th, 27th and 28th June; and
- Survey visit 4 – 17th, 18th and 19th July.

Survey visits took place during the 2022 breeding season on:

- Survey visit 1 – 16th, 17th, 18th, 19th April;
- Survey visit 2 – 11th, 13th, 14th, 15th May;
- Survey visit 3 – 15th, 16th, 18th and 19th June; and
- Survey visit 4 – 14th, 15th, 16th and 17th July.

Survey visits took place during the 2023 breeding season on:

- Survey visit 1 – 8th, 9th, 18th, 19th April;
- Survey visit 2 – 9th, 12th, 18th, 19th May;
- Survey visit 3 – 9th, 10th, 22nd, 24th June; and
- Survey visit 4 – 9th, 13th, 19th and 25th July.

4.3.5 Black Grouse Survey

Due to the presence of suitable habitat for breeding black grouse (*Tetrao tetrix*), dedicated black grouse surveys were undertaken covering all suitable habitat within the Site and 1.5 km Study Area buffer. The survey methods followed those recommended by Gilbert *et al.* (2011).

Survey visits took place during the 2022 breeding season on:

- April 20th, 21st, 23rd, 25th and May 10th.

4.3.6 Wintering Bird Survey

A full wintering bird survey was completed between October 2022 and March 2023 and consisted of six visits. The survey comprised a combination of a walkover survey, completed as per survey methods recommended

by Gilbert *et al.* (2012) and dusk vantage point surveys. The dusk vantage point surveys were specifically placed to cover sections of habitat considered suitable for roosting hen harrier in areas that were not covered by VP surveys and within 2km of the Site boundary. Winter VP's from VP1-8 were modified to finish at dusk rather than sunset to cover the potential for roosting raptors during the same time period.

Survey visits took place during the 2022-2023 winter season on:

- October 13th, 17th, 18th, 25th, 31st;
- November 15th, 22nd;
- December 11th, 12th, 15th ;
- January 10th, 19th;
- February 23rd, 26th; and
- March 3rd, 23rd, 27th, 28th.

Surveys took place of the sections of the SPA within 2km of the Northern Development Area during the 2023-2024 winter season on:

- October 25th, 30th;
- November 22nd, 28th;
- January 9th, 19th, 28th;
- February 19th; and
- March 1st.

4.3.7 Survey Limitations

The survey timings were completed as per the recommended guidance with only limited restrictions in access to some walkover surveys in areas outside the red line boundary. Any access restrictions were overcome with surveyors observing the areas of restricted access with binoculars and listening for the calls of target species.

5. Baseline

5.1 Desk Study

5.1.1 Site Designations

As summarised in Table 2 below, and displayed on **Figure 6.3** (EIA Report Volume 2), one international and one national statutory nature conservation designations occur within 20 km and 5 km of the Site, respectively. A single non-statutory site was also recorded within 5 km of the Site.

Table 3: Nature Conservation Designations (bird qualifying features only) within 10km of the Site

Name	Designation	Distance & Direction	Ornithological Qualifying Features
Muirkirk and North Lowther Uplands	SPA	Borders Site (existing B743 road linking two Site areas is within the	<p>Muirkirk and North Lowther Uplands SPA qualifies under Article 4.1 by regularly supporting populations of European importance of the Annex 1 species:</p> <ul style="list-style-type: none"> ➤ Breeding and non-breeding hen harrier (<i>Circus cyaneus</i>) (between 1994 and 1998, an average of 29.2 breeding females, 6% of the GB population and between 1991 and 1995, an average of 12 individuals, 2% of the GB population);

Name	Designation	Distance & Direction	Ornithological Qualifying Features
		SPA/SSSI boundary)	<ul style="list-style-type: none"> ➤ Breeding short-eared owl (<i>Asio flammeus</i>) (between 1997 and 1998, an average of 26 pairs, 3% of the GB population); ➤ Breeding merlin (<i>Falco columbarius</i>) (between 1989 and 1998, an average of 9 pairs, 0.7% of the GB population and selected as one of the most suitable sites for merlin in GB); ➤ Breeding peregrine (<i>Falco peregrinus</i>) (between 1992 and 1996, an average of 6 pairs, 0.5% of the GB population and selected as one of the most suitable sites for peregrine in GB); and ➤ Breeding golden plover (<i>Pluvialis apricaria</i>) (1999, an estimated minimum of 154 pairs, 0.7% of the GB population and selected as one of the most suitable sites for golden plover in GB).
	SSSI (Muirkirk Uplands)		<p>The Muirkirk Uplands SSSI includes two upland areas situated to the north and south of the town of Muirkirk, and Airds Moss, a low lying blanket bog lying between these areas.</p> <p>Notified nature features include the following relevant to ornithology:-</p> <ul style="list-style-type: none"> ➤ Breeding bird assemblage; ➤ Hen harrier, breeding; ➤ Hen harrier, non-breeding; and ➤ Short-eared owl, breeding <p>The breeding bird assemblage consists of the following species:</p> <p>The mosaic of habitats within the Muirkirk Uplands supports a diverse upland breeding bird community which is of national importance. The upland moorland bird assemblage includes teal, hen harrier, buzzard (<i>Buteo buteo</i>), merlin, peregrine, short-eared owl, red grouse (<i>Lagopus lagopus</i>), golden plover, dunlin (<i>Calidris alpina</i>), snipe (<i>Gallinago gallinago</i>), curlew (<i>Numenius arquata</i>), redshank (<i>Tringa totanus</i>), whinchat (<i>Saxicola rubetra</i>), stonechat (<i>Saxicola rubicola</i>), wheatear (<i>Oenanthe oenanthe</i>), and ring ouzel (<i>Turdus torquatus</i>).</p>
Airds Moss	RSPB Reserve (also SAC)	2.3km SW	<p>Airds Moss is the largest unafforested blanket bog in the South Strathclyde region and is situated within the Muirkirk Uplands between the towns of Cumnock and Muirkirk in East Ayrshire. The entire site is 8km in length and 2.5 km wide. The bog forms part of a wider area of upland moorland within the catchment of the River Ayr.</p> <p>The area forms part of the SPA described above as it supports breeding and wintering hen harrier, merlin, peregrine, short-eared owl and golden plover. Over 400 ha of Airds Moss is managed as a wildlife reserve by the RSPB, who aim to improve the condition of the bog and adjacent floodplain habitats for the benefit of wild birds and other species.</p>

5.2 Field Surveys

The following section outlines the relevant results of the ornithological survey data recorded between April 2021 and March 2024 at the Proposed Development.

5.2.1 VP Survey results

Six Schedule 1 species were recorded during the ornithological surveys in the Northern Development Area; goshawk (*Accipiter gentilis*), hen harrier, merlin, osprey (*Pandion haliaetus*), peregrine and red kite (*Milvus milvus*) with all bar merlin recorded during VP surveys.

Four Schedule 1 species were recorded during the ornithological surveys at the Southern Development Site; hen harrier, merlin, peregrine and red kite.

A total of seven Schedule 1 species were recorded during the 24 months of ornithological surveys of the Wider Site which were the same six species as described for the Northern Development Area above plus a single record of marsh harrier (*Circus aeruginosus*) recorded on a walk to a VP survey.

A total of six wader species were recorded during VP surveys at the Southern and Northern Development Areas, common sandpiper (*Actitis hypoleucos*), curlew, golden plover, oystercatcher (*Haematopus ostralegus*) and woodcock (*Scolopax rusticola*). The same six wader species were recorded during VP surveys of the Wider Site plus snipe.

In addition greylag goose, pink-footed goose and whooper swan were recorded from VP surveys in the Northern and Southern Development Area.

A summary of the VP survey visit details (i.e. dates, times and weather data) are presented in Annex A: Survey Data Summary, Table A1 and A2, the VP flight activity data for target species summarised in Annex A, Table A3 and A4 and the individual flight data are shown in Annex A, Tables A5-16. The flightlines recorded for all target species are shown in TA6.1 Figures 1-3; Confidential Annex 6.1; TA6.1 Figures 1-2.

5.2.2 Breeding Bird Survey

The results of the breeding bird survey are shown in Annex B, Table B1 and the key species territories mapped in TA6.1 Figures 4 and 5-7. For reasons of brevity, species common names are referred to here, with the scientific names presented in the full results in Annex B.

The breeding bird survey identified five breeding species of wader (common sandpiper, curlew, lapwing, oystercatcher and snipe). All five species were recorded during surveys of the Southern Development Area (and the Wider Site) and all bar lapwing were recorded at the Northern Development Area.

In addition to wader species discussed above the breeding bird surveys identified: a single Schedule 1 species (common crossbill), six BoCC red-list species and 13 BoCC amber-list within the Northern Development Study Area and nine BoCC red-list species and 13 BoCC amber-list within the Southern Development Study Area.

5.2.3 Breeding Raptor Survey

The breeding raptor survey identified a total of two Schedule 1 species breeding within the Breeding Raptor Study Area (peregrine and red kite) and the locations of all the breeding records are shown in Confidential Annex 7.1 Figure 3.

5.2.4 Black Grouse Survey

No evidence of black grouse was recorded during all black grouse surveys at the Site.

5.2.5 Wintering Bird Survey

A wintering bird survey was completed over two winter seasons in 2022-2023 and 2023-2024 specifically aimed at identifying potential winter roosts of hen harrier. No roosts were identified in either survey.

5.3 Species Accounts – Northern Development Area

5.3.1.1 Goshawk

A total of four flights of goshawk were recorded from flight activity surveys (Confidential Annex 6.1: Figure 1: Table A10), one flight from VP11 on 7th April 2022, one from VP10 on 14th September 2022, one from VP9 from 23rd October 2022 and a second record from VP11 on 17th June 2023. The total flight time for goshawk was 283 seconds with 251 seconds recorded at HB2 (between 20-40m) and the remaining 32 seconds at HB3 (40-80 m).

Goshawk was registered twice during breeding raptor walkover surveys: one record in April 2022 in Dungavel Forest and the second in woodland near Muirkirk during May 2023 surveys, with both birds noted as being present in suitable breeding habitat. Subsequent surveys did not register goshawk again in the same areas and any breeding attempt could not be confirmed. The plantation forestry within and close to the Northern Development Area is considered suitable breeding habitat for goshawk.

5.3.1.2 Hen harrier

Hen harrier were recorded once during VP surveys throughout the survey period with a female being briefly recorded (14 seconds at HB1 (below 20m)) from VP10 on January 8th 2023 (see Confidential Annex 6.1: Figure 1: Table A5).

A single male bird was recorded in the Wider Site during the August 2021 breeding bird walkover surveys and second female type hunting in the southern part of the Breeding Raptor Survey Area in July 2022 and again in May 2023. No evidence of breeding activity was recorded for hen harrier during the breeding walkover surveys within the Breeding Raptor Survey Area.

5.3.1.3 Merlin

Merlin were not recorded during flight activity surveys. Merlin were recorded during breeding walkover surveys but no evidence of breeding was recorded within the Breeding Raptor Survey Area.

5.3.1.4 Osprey

Osprey were recorded once during VP surveys throughout the survey period with a single bird recorded from VP10 on 6th April 2023 (see Confidential Annex 6.1: Figure 1: Table A12). The total flight time recorded was 176 seconds all recorded between 80-230m.

A single bird was recorded in August 2021 during breeding bird walkover surveys with a second record of a bird over quarry water during the June 2022 raptor walkover survey. No evidence of breeding activity was recorded for osprey during the breeding walkover surveys.

5.3.1.5 Peregrine

Peregrine were recorded on two occasions, both times from VP9, during VP surveys, with an unsexed individual registered on 8th February 2023 and a female registered on 13th August 2023 (see Confidential Annex 6.1: Figure 1: Table A6). The total flight time was 373 seconds all recorded between 80-230m.

No evidence of peregrine breeding activity was confirmed within the Site boundary during the breeding walkover surveys, although a known eyrie was confirmed in 2021, 2022 and 2023 as breeding over 5km from the Site. The nest produced three fledglings in 2021 and four in 2022 while the outcome in 2023 breeding season is not known.

5.3.1.6 Red kite

A total of four flights of red kite were recorded from flight activity surveys (see Confidential Annex 6.1: Figure 1: Table A14), three flights from VP10 on September 14th 2022, 5th February 2023 and 5th March 2023 and one from VP9 on October 23rd 2022. The total flight time for red kite was 782 seconds with 129 seconds recorded at HB1 and HB2 (below 40m), 453 seconds recorded at HB3 (between 40-80m) and the remaining 91 seconds at HB4 (80-230m).

A single breeding record for red kite was recorded in 2022, the record was located over 2km from the Site boundary but within the Breeding Raptor Survey Area (see Confidential Annex 6.1: Figure 3).

5.3.2 Secondary Target Raptors and Raven

5.3.2.1 Buzzard, Kestrel, Sparrowhawk and Raven

Buzzard (*Buteo buteo*), kestrel (*Falco tinnunculus*), sparrowhawk (*Accipiter nisus*) and raven (*Corvus corax*) were commonly recorded during VP surveys and breeding records were noted for all four species.

5.3.3 Waders

A total of six wader species were recorded during the surveys at the Northern Development Area, common sandpiper, curlew, golden plover, oystercatcher, snipe and woodcock of which all bar oystercatcher and snipe were recorded during VP surveys.

5.3.3.1 Common sandpiper

A single common sandpiper flight was recorded once from VP surveys on May 28th 2023 (TA6.1 Figure 1: Table A8) with a further five records of birds calling but not seen were also recorded from VP11. The total flight time for common sandpiper was 84 seconds all recorded below 20m.

The breeding bird surveys identified a breeding territory for common sandpiper on Glengavel Water west of the Northern Development Area in 2022 and 2023 (TA6.1 Figure 4).

5.3.3.2 Curlew

A total of seven curlew flights totalling eight individuals were recorded during the VP surveys (TA6.1 Figure 1: Table A9). The total flight time recorded was 280 seconds all recorded below 80m. Of the seven records five were from VP11, across two days (28th May 2023 and 17th June 2023) and one record at each of VP10 on April 6th 2023 and VP9 on June 18th 2023.

The breeding bird survey identified a single breeding territory within 500m of the Northern Development Area in 2022 (TA6.1 Figure 4).

5.3.3.3 Golden plover

A total of three golden plover flights, totalling 13 individuals, were recorded during the VP surveys (TA6.1 Figure 1: Table A7). The total flight time recorded was 290 seconds of which 230 seconds was at HB4 (80-230m). There was one flight recorded each at VP9, V10 and VP11 with two flights in April 2023 and the third on August 13th 2023.

No evidence of breeding activity was recorded during the breeding walkover surveys.

5.3.3.4 Oystercatcher

Oystercatcher were not recorded during VP surveys. The breeding bird survey identified a single oystercatcher territory within the 500m buffer of the Northern Development Area in 2023 (TA6.1 Figure 4).

5.3.3.5 Snipe

Snipe were not recorded during VP surveys. The breeding bird survey identified a single snipe territory within the 500m buffer of the Northern Development Area in 2023 (TA6.1 Figure 4).

5.3.3.6 Woodcock

Woodcock was recorded once from VP surveys with a single bird recorded from VP10 on February 5th 2023 (TA6.1 Figure 4: Table A16) and occasional birds were flushed from the Site during the wintering bird surveys.

5.3.4 Other Species

5.3.4.1 Black grouse

No evidence of black grouse was recorded during the black grouse surveys in 2022. No black grouse were flushed from the Site during all breeding walkover surveys.

5.3.4.2 Whooper swan

A single flight of 12 whooper swan (*Cygnus cygnus*) were recorded from VP surveys with 12 individuals recorded from VP10 on October 24th 2022 (TA6.1 Figure 2: Table A15).

5.3.4.3 Greylag goose

A total of two flights of greylag goose (*Anser anser*) were recorded from VP surveys with the flights totalling 15 individuals with a single bird recorded from VP11 on April 19th 2023 and 14 from VP12 on January 8th 2024. The total flight time was 144 seconds, spread between HB2 and HB4 (20-230m). No evidence of breeding activity was recorded during the breeding bird survey (TA6.1 Figure 2: Table A11).

5.3.4.4 Pink-footed goose

A total of 19 flights of pink-footed goose (*Anser brachyrhynchus*) were recorded from VP surveys with the flights totalling 884 individuals and including groups of between 3 and 120. All flights were recorded between October 2022 and April 2023 and September 2023 and February 2024 winter seasons. The total flight time was 2400 seconds, spread between HB2 and HB5 with 1,221 seconds recorded at HB4 (80-230m).

The flights were generally in a north-west to south-east (or vice versa) direction over the Site (TA6.1 Figure 2: Table A13).

5.3.4.5 Other Wildfowl

Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*) and goosander (*Mergus merganser*) were registered occasionally from VP surveys.

5.3.4.6 Gulls

Black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), great black-backed gull (*Larus marinus*) and lesser black-backed gull (*Larus fuscus*) were recorded occasionally during VP surveys.

For the four gull species, a total of 15 flights were recorded over the 24 months, for common gull (7 flights comprising 32 individuals) were the most frequently recorded with less frequent records, lesser black-backed gull (5 flights, 8 individuals) great black-backed gull (1 individuals) and black-headed gull (2 flights, 10 individuals).

5.3.4.7 Breeding passerines

In addition to the raptor and wader species discussed above the breeding bird surveys identified: a single Schedule 1 species (common crossbill), six BoCC red-list species: cuckoo, grasshopper warbler, lesser redpoll, mistle thrush, skylark and spotted flycatcher) as holding territories within the Northern Development Area and 500m.

A further nine BoCC amber-list species were recorded as holding territories within the study area (dunnock, dipper, grey wagtail, long-eared owl, meadow pipit, song thrush, woodpigeon, willow warbler and wren) and a further 16 common and widespread (BoCC Green listed) species were also recorded. For full details and scientific names see Annex B; Table B1.

The majority of the Northern Development Area is plantation forestry and the most populous species recorded were coal tit, chaffinch, robin, siskin, willow warbler and wren. The locations of the crossbill territories is shown in TA6.1 Figure 4.

5.4 Species Accounts – Southern Development Area

5.4.1 Scarce Raptors and Owls

Four Schedule 1 species were recorded during the ornithological surveys; hen harrier, merlin, peregrine and red kite (*Milvus milvus*) at the Southern Development Area.

5.4.1.1 Hen harrier

Two records of a male hen harrier were recorded during VP surveys, one in September and one in November 2022, both flights were over 1 km north of the Site boundary (see Confidential Annex 6.1: Figure 2: Table A4). There was no evidence of hen harrier breeding within 2 km of the Southern Development Area.

5.4.1.2 Merlin

Merlin were recorded on four occasions during flight activity surveys, with two records in October 2021, one in August 2022 and one in October 2022 (see Confidential Annex 6.1: Figure 2: Table A4). The flights were all recorded in the south-west of the Southern Development Area and in fields and forestry in the area to lying further south. There was no evidence of merlin breeding within 2km of the Southern Development Area.

5.4.1.3 Peregrine

Peregrine were recorded on seven occasions during VP surveys, of which one of the seven registrations was recorded over the Southern Development Area, the remaining six were over Middlefield Law approximately 1km north of the Site boundary (see Confidential Annex 6.1: Figure 2: Table A4). As discussed above, a known eerie was identified as active in 2021, 2022 and 2023 during breeding raptor surveys, the eerie is over 5km from the Site boundary.

5.4.1.4 Red kite

A red kite was recorded twice on 4th May 2022 from flight activity surveys, both flights were outside the Site (see Confidential Annex 6.1: Figure 2: Table A4). A single breeding record for red kite was recorded in 2022 the record was over 2 km from the Site boundary but within the Breeding Raptor Survey Area (see Confidential Annex 6.1: Figure 3).

5.4.2 Waders

A total of six wader species were recorded during the surveys at the Southern Development Area, common sandpiper, curlew, golden plover, oystercatcher, snipe and woodcock of which all bar common sandpiper and snipe were recorded during VP surveys.

5.4.2.1 Common sandpiper

Common sandpiper was not recorded from VP surveys. The breeding bird surveys identified a breeding territory for common sandpiper on Greenock Water south of the Southern Development Area in 2022 and 2023 (TA6.1 Figures 6 and 7).

5.4.2.2 Curlew

A total of 33 curlew flights totalling 84 individuals were recorded during the VP surveys (TA6.1 Figure 3: Table A4). Of the 33 flights recorded, a total of 24 were record over the Southern Development Area. Of the 34 flights seven were recorded on 25th March 2022, 18 were recorded on 4th May 2022 and three on 5th July 2022 and three records were of groups of 11, 14 and 15 recorded 25th March 2022, 18th June 2021 and 25th June respectively.

The breeding bird survey identified two curlew breeding territories within the Southern Development Area in 2021 and 2022, with a further three and one territories respectively in the 500m buffer (TA6.1 Figures 6 and 7).

5.4.2.3 Golden plover

A flight of 34 golden plover was recorded on 21st February 2022 during the VP surveys (TA6.1 Figure 3: Table A4). No evidence of breeding activity was recorded during the breeding walkover surveys.

5.4.2.4 Lapwing

A total of nine lapwing flights totalling 27 individuals were recorded during the VP surveys (TA6.1 Figure 3: Table A4). The breeding bird survey identified four lapwing breeding territories within the Southern Development Area in 2021, once in 2022 and no records in 2023 (TA6.1 Figures 5-7).

5.4.2.5 Oystercatcher

A total of 13 oystercatcher flights totalling 22 individuals were recorded during the VP surveys (TA6.1 Figure 3: Table A4). The breeding bird survey identified two oystercatcher territories within the Southern Development Area and a further two in the 500m buffer in both 2022 and 2023 (TA6.1 Figures 5-7).

5.4.2.6 Snipe

Snipe were not recorded during VP surveys. The breeding bird survey identified a single snipe territory within the Southern Development Area in 2022 and single record in the 500m buffer in 2023 (TA6.1 Figures 6 and 7).

5.4.2.7 Woodcock

Woodcock was recorded once from VP surveys (TA6.1 Figure 3).

5.4.3 Other Species

5.4.3.1 Black grouse

A male black grouse flew high to the north of the Southern Development Area on 4th May 2022 (TA6.1 Figure 3). No evidence of black grouse was recorded during the black grouse surveys in 2022. No black grouse were flushed from the Site during all breeding walkover surveys.

5.4.3.2 Other Species

A total of six greylag goose and five pink-footed geese flights were recorded during flight activity surveys (TA6.1 Figure 3). Black-headed gull, common gull, great black-backed gull, herring gull and lesser black-backed gull were recorded occasionally during VP surveys with a combined total of 25 flights.

5.4.3.3 Breeding passerines

In addition to the raptor and wader species discussed above the breeding bird surveys identified: nine BoCC red-list species: (grasshopper warbler, greenfinch, house sparrow, lesser redpoll, skylark, spotted flycatcher, starling, whinchat and yellowhammer) as holding territories within the Southern Development Area and 500m.

In addition, a further 13 BoCC amber-list species were recorded as holding territories (bullfinch, dunnock, grey wagtail, house martin, mallard, meadow pipit, reed bunting, song thrush, stock dove, wheatear, woodpigeon, willow warbler and wren) and a further 16 common and widespread (BoCC Green listed) species were also recorded. For full details and scientific names see Annex B; Table B1.

Of those recorded in the Southern Development Area, skylark and meadow pipit were by far the most populous and were ubiquitous through all the open areas. The majority of the other species were associated with the sections of broadleaved woodland, plantation woodland, riparian habitats and buildings.

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Annex A: Survey Data Summary

Table A1 - Vantage point survey timings and weather – Northern Development Area

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
20-Apr-22	10	08:30	11:30	3	SE	3	1	0	0	0
07-Apr-22	11	13:50	16:50	3	NW	5	5	0	0	0
20-Apr-22	9	12:50	15:50	3	SE	4	3	0	0	0
07-Apr-22	10	11:35	14:45	3	N	4	6	0	0	0
20-Apr-22	11	09:55	12:55	3	S	2	2	0	0	0
07-Apr-22	9	07:50	11:00	3	N	5	8	3	1	0
01-May-22	10	11:50	14:55	3	S	3	7	1	0	0
17-May-22	10	09:50	12:50	3	SE	5	8	0	0	0
26-May-22	10	14:00	17:00	3	W	6	7	3	0	0
01-May-22	11	18:00	21:00	3	S	3	5	0	0	0
17-May-22	11	13:10	16:10	3	SE	3	8	0	0	0
27-May-22	11	12:45	15:45	3	NW	6	4	0	0	0
01-May-22	9	07:45	10:45	3	S	3	7	0	0	0
17-May-22	9	05:00	08:00	3	SE	4	7	0	0	0
26-May-22	9	18:30	21:30	3	NW	4	6	0	0	0
03-Jun-22	10	19:00	22:00	3	NE	3	3	0	0	0
11-Jun-22	10	04:35	07:35	3	SW	6	8	1	0	0
25-Jun-22	10	15:00	18:00	3	S	5	5	0	0	0
04-Jun-22	11	08:30	11:30	3	E	3	5	0	0	0
10-Jun-22	11	09:50	12:50	3	SW	6	5	0	0	0
25-Jun-22	11	04:30	07:35	3	S	4	7	0	0	0
03-Jun-22	9	14:30	17:30	3	NE	4	5	0	0	0
11-Jun-22	9	08:40	11:45	3	SW	5	8	1	0	0
25-Jun-22	9	19:10	22:10	3	SE	3	5	0	0	0
08-Jul-22	10	19:00	22:00	3	W	4	7	0	0	0
31-Jul-22	10	12:20	15:20	3	S	2	8	0	0	0
02-Jul-22	11	19:10	22:10	3	W	4	7	0	0	0
02-Jul-22	10	04:40	07:50	3	SW	4	7	3	0	0
22-Jul-22	10	08:15	11:30	3	SE	3	7	0	0	0
07-Jul-22	11	04:40	07:45	3	W	2	4	0	0	0
21-Jul-22	11	14:00	17:00	3	SE	2	6	0	0	0
31-Jul-22	11	12:35	15:50	3	S	2	8	0	0	0
02-Jul-22	9	09:05	12:15	3	SW	3	7	3	0	0
09-Jul-22	9	04:30	07:30	3	W	2	5	0	0	0
22-Jul-22	9	12:45	15:55	3	SE	3	7	0	0	0
31-Jul-22	9	08:00	11:00	3	S	3	8	0	0	0
12-Sep-22	9	18:10	20:10	2	W	2	3	0	0	0
14-Sep-22	10	06:40	09:40	3	NW	2	7	0	0	0
14-Sep-22	10	10:10	13:10	3	NW	2	7	0	0	0
02-Oct-22	11	07:21	10:21	3	SE	2	6	1	0	0

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
02-Oct-22	11	10:51	13:51	3	ESE	2	3	0	0	0
18-Oct-22	11	07:50	10:50	3	SE	2	6	0	0	0
18-Oct-22	11	11:20	14:20	3	SE	3	4	0	0	0
23-Oct-22	9	08:05	11:05	3	SE	3	7	3	0	0
23-Oct-22	9	11:35	14:35	3	SE	3	7	3	0	0
24-Oct-22	10	16:25	18:25	2	SW	4	8	3	0	0
20-Nov-22	9	14:30	16:30	2	SW	3	8	0	0	0
21-Nov-22	10	08:00	11:00	3	E	3	7	0	0	1
21-Nov-22	10	11:30	14:30	3	E	3	7	0	0	1
17-Nov-22	11	10:20	13:20	3	NE	2	8	4	0	0
17-Nov-22	11	13:50	16:50	3	NE	3	8	5	0	0
10-Dec-22	9	10:00	14:00	4	NNW	1	8	0	1	2
12-Dec-22	10	09:05	13:05	4	E	2	5	0	1	2
08-Jan-23	10	08:40	11:40	3	SW	5	5	0	0	0
08-Jan-23	10	12:10	15:10	3	SW	5	5	0	0	0
10-Jan-23	9	08:40	11:40	3	SSW	5	8	2	0	0
10-Jan-23	9	12:10	15:10	3	SSW	5	8	2	0	0
24-Jan-23	11	08:15	11:15	3	SSW	1	8	0	0	0
24-Jan-23	11	11:45	14:45	3	SW	2	8	1	0	0
04-Feb-23	9	10:15	14:15	4	SSE	3	8	0	0	0
05-Feb-23	10	11:00	14:00	3	SSW	2	6	0	0	0
05-Feb-23	10	14:30	17:30	3	SSW	2	6	0	0	0
08-Feb-23	9	11:06	14:06	3	SSW	4	8	0	0	0
08-Feb-23	9	14:36	17:36	3	SSW	4	8	0	0	0
22-Feb-23	11	11:35	14:35	3	NNW	2	8	0	0	0
22-Feb-23	11	15:05	18:05	3	NW	3	8	0	0	0
02-Mar-23	11	07:05	10:05	3	NE	2	8	1	0	0
02-Mar-23	11	10:35	13:35	3	ENE	3	7	1	0	0
04-Mar-23	9	07:00	10:00	3	NNE	2	6	0	0	0
04-Mar-23	9	10:30	13:30	3	NNE	2	6	0	0	0
05-Mar-23	10	07:00	10:00	3	WSW	2	8	0	0	0
05-Mar-23	10	10:30	13:30	3	WSW	2	8	0	0	0
06-Apr-23	10	13:30	16:30	3	S	5	5	0	0	0
06-Apr-23	10	17:00	20:00	3	NW	5	4	0	0	0
09-Apr-23	9	06:25	09:25	3	S	3	5	0	0	0
09-Apr-23	9	09:55	12:55	3	S	4	3	0	0	0
19-Apr-23	11	06:00	09:00	3	E	4	2	0	0	1
19-Apr-23	11	09:30	12:30	3	ESE	4	1	0	0	1
18-Apr-23	12	06:05	09:05	3	E	3	1	0	0	0
18-Apr-23	12	09:35	12:35	3	E	3	1	0	0	0
23-May-23	10	09:30	12:30	3	WNW	3	7	0	0	0
23-May-23	10	13:00	16:00	3	W	3	7	0	0	0
12-May-23	9	14:45	17:45	3	E	2	8	0	0	0
12-May-23	9	18:18	21:18	3	E	2	8	0	0	0

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
23-May-23	12	09:30	12:30	3	W	4	7	0	0	0
23-May-23	12	13:00	16:00	3	W	4	8	0	0	0
28-May-23	11	15:05	18:05	3	SW	3	5	0	0	0
28-May-23	11	18:35	21:35	3	W	2	5	0	0	0
17-Jun-23	11	08:00	11:00	3	E	2	7	0	0	0
17-Jun-23	11	11:30	14:30	3	E	2	8	0	0	0
18-Jun-23	9	09:10	12:10	3	SSW	3	7	0	0	0
18-Jun-23	9	12:40	15:40	3	SW	3	7	0	0	0
19-Jun-23	12	10:45	13:45	3	SSE	3	7	0	0	0
19-Jun-23	10	10:45	13:45	3	SW	3	6	0	0	0
19-Jun-23	12	14:15	17:15	3	S	4	4	0	0	0
19-Jun-23	10	14:15	17:15	3	SW	4	6	0	0	0
05-Jul-23	11	12:15	15:15	3	W	2	4	0	0	0
05-Jul-23	11	15:45	18:45	3	W	2	4	1	0	0
08-Jul-23	12	10:45	13:45	3	S	4	7	0	0	0
08-Jul-23	12	14:15	17:15	3	SE	3	8	0	0	0
08-Jul-23	10	10:45	13:45	3	SE	4	4	0	0	0
08-Jul-23	10	14:15	17:15	3	SE	4	7	0	0	0
07-Jul-23	9	15:30	18:30	3	SE	4	3	0	0	0
07-Jul-23	9	19:00	22:00	3	SE	4	2	0	0	0
08-Aug-23	9	09:05	12:05	3	W	4	7	0	0	0
16-Aug-23	10	05:50	08:50	3	SW	1	8	1	0	0
16-Aug-23	10	09:20	12:20	3	SW	1	8	0	0	0
14-Aug-23	10	14:25	17:25	3	N	1	7	0	0	0
14-Aug-23	10	17:55	20:55	3	N	1	7	0	0	0
08-Aug-23	9	05:35	08:35	3	W	4	5	0	0	0
13-Aug-23	9	08:25	11:25	3	SW	3	8	0	0	0
13-Aug-23	9	11:55	14:55	3	SW	3	8	0	0	0
07-Aug-23	11	05:30	08:30	3	W	2	8	0	0	0
07-Aug-23	11	09:00	12:00	3	W	2	8	0	0	0
14-Aug-23	12	14:25	17:25	3	N	1	7	0	0	0
14-Aug-23	12	17:55	20:55	3	N	1	7	0	0	0
16-Aug-23	12	05:50	08:50	3	SSW	1	8	1	0	0
16-Aug-23	12	09:20	12:20	3	SW	1	8	0	0	0
19-Aug-23	11	08:10	11:10	3	SSW	3	6	0	0	0
19-Aug-23	11	11:40	14:40	3	SSW	3	6	0	0	0
17-Sep-23	9	06:50	09:50	3	ESE	3	6	2	0	0
17-Sep-23	9	10:20	13:20	3	ESE	3	6	2	0	0
26-Sep-23	10	10:00	13:00	3	S	4	8	0	0	0
26-Sep-23	10	13:30	16:30	3	S	4	8	0	0	0
14-Sep-23	11	06:42	09:42	3	SW	2	8	0	0	0
14-Sep-23	11	10:12	13:12	3	SW	3	8	0	0	0
26-Sep-23	12	10:00	13:00	3	S	4	8	0	0	0
26-Sep-23	12	13:30	16:30	3	S	4	8	0	0	0

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
22-Oct-23	9	09:50	12:50	3	SW	3	4	0	0	0
22-Oct-23	9	13:20	16:20	3	SW	3	4	0	0	0
23-Oct-23	10	08:00	11:00	3	E	3	2	0	0	0
23-Oct-23	10	11:30	14:30	3	E	3	2	0	0	0
11-Oct-23	11	07:33	10:33	3	NW	4	5	0	0	0
11-Oct-23	11	11:03	14:03	3	NNW	4	4	0	0	0
23-Oct-23	12	08:00	11:00	3	E	3	2	0	0	0
23-Oct-23	12	11:30	14:30	3	E	3	2	0	0	0
11-Nov-23	11	09:49	12:49	3	SE	2	3	0	0	0
11-Nov-23	11	13:19	16:19	3	SE	2	7	0	0	0
17-Nov-23	12	09:40	12:40	3	E	1	4	0	0	0
17-Nov-23	12	13:10	16:10	3	E	1	6	0	0	0
17-Nov-23	10	09:40	12:40	3	E	1	4	0	0	0
17-Nov-23	10	13:10	16:10	3	E	1	6	0	0	0
18-Nov-23	9	09:35	12:35	3			6	1	0	0
18-Nov-23	9	13:05	16:05	3	SW	2	8	1	0	0
01-Dec-23	11	09:19	12:19	3	SSE	1	4	0	0	2
01-Dec-23	11	12:49	15:49	3	SSE	1	3	0	0	2
04-Dec-23	12	09:16	12:16	3	NE	3	8	0	0	2
04-Dec-23	12	12:46	15:46	3	NE	3	8	0	0	2
04-Dec-23	10	08:55	11:55	3	NE	3	8	0	1	2
04-Dec-23	10	12:25	15:25	3	NE	3	8	0	1	2
03-Dec-23	9	08:45	11:45	3	NE	2	7	0	1	2
03-Dec-23	9	12:15	15:15	3	NE	2	8	0	0	2
06-Jan-24	11	09:29	12:29	3	NW	1	4	0	0	0
06-Jan-24	11	12:59	15:59	3	NNW	2	4	0	0	0
08-Jan-24	12	08:40	11:40	3	NE	2	8	0	0	2
08-Jan-24	12	12:10	15:10	3	NE	2	8	0	0	2
08-Jan-24	10	08:40	11:40	3	NE	2	8	0	0	2
08-Jan-24	10	12:10	15:10	3	NE	2	8	0	0	2
07-Jan-24	9	08:45	11:45	3	ESE	1	7	0	0	2
07-Jan-24	9	12:15	15:15	3	ESE	1	4	0	0	2
03-Feb-24	9	10:25	13:25	3	WSW	4	5	0	0	0
05-Feb-24	10	10:30	13:30	3	S	5	8	0	0	0
05-Feb-24	10	14:00	17:00	3	SW	5	8	1	0	0
03-Feb-24	9	13:55	16:55	3	WSW	4	6	0	0	0
01-Feb-24	11	10:16	13:16	3	SW	3	8	0	0	0
01-Feb-24	11	13:46	16:46	3	SW	3	8	0	0	0
05-Feb-24	12	10:30	13:30	3	S	5	8	0	0	0
05-Feb-24	12	14:00	17:00	3	SW	5	8	1	0	0

Meteorological Key:				
Wind speed	Cloud cover	Rain	Snow	Frost
calm = 0 light air = 1 Light breeze = 2 Gentle Breeze = 3 Mod. Breeze = 4 fresh breeze = 5 strong breeze = 6 mod. gale = 7 fresh gale = 8 strong gale = 9	In eighths e.g 0/8 = no cloud 8/8 = full cloud cover	None = 0 Occasional=1 Drizzle / mist = 2 Light shower = 3 Heavy shower = 4 Heavy rain = 5	None = 0 On Site = 1 Snowing = 2	None = 0 Ground = 1 All day = 2

Table A2 - Vantage point survey timings and weather – Southern Development Area

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
30-May-21	3	10:45	13:45	3	S	4	5	0	0	0
27-May-21	3	10:50	13:50	3	SW	2	3	0	0	0
25-Jun-21	3	09:00	12:00	3	NE	3	7	0	0	0
18-Jun-21	3	11:50	14:50	3	N	2	0	0	0	0
10-Jun-21	3	13:30	16:30	3	SSW	4	7	0	0	0
31-Jul-21	3	18:25	21:25	3	W	2	6	0	0	0
27-Jul-21	3	05:00	08:00	3	W	2	8	2	0	0
15-Jul-21	3	18:45	21:45	3	SE	3	7	0	0	0
11-Jul-21	3	14:30	17:30	3	SW	3	7	0	0	0
05-Jul-21	3	04:30	07:30	3	SW	4	6	0	0	0
11-Aug-21	3	09:50	12:50	3	S	3	7	0	0	0
19-Aug-21	3	10:30	13:30	3	SW	2	7	0	0	0
25-Sep-21	3	14:39	15:39	1	SSW	4	7	0	0	0
25-Sep-21	3	16:09	19:09	3	S	4	8	0	0	0
26-Sep-21	3	09:10	11:10	2	SSW	3	5	0	0	0
22-Oct-21	3	10:55	13:55	3	NNE	2	8	0	0	0
22-Oct-21	3	14:25	17:25	3	NNE	3	5	0	0	0
23-Nov-21	3	09:00	12:30	3	WSW	7	3	0	0	0
23-Nov-21	3	13:00	16:00	3	WSW	2	6	0	0	0
18-Dec-21	3	12:13	15:13	3	NE	1	0	0	0	1
21-Feb-22	3	10:40	13:40	3	SW	4	6	0	1	0
21-Feb-22	3	14:10	17:10	3	NNW	4	3	0	1	0
22-Feb-22	3	14:25	17:25	3	W	4	4	0	1	0
25-Mar-22	3	06:07	09:07	3	E	2	6	0	0	1
25-Mar-22	3	09:37	12:37	3	S	2	4	0	0	0
02-May-22	3	16:00	19:00	3	E	1	8	0	0	0
04-May-22	3	13:00	16:00	3	W	4	8	0	0	0
04-May-22	3	16:30	19:30	3	W	4	8	0	0	0
05-Jul-22	3	04:35	07:35	3	W	3	8	1	0	0
05-Jul-22	3	08:05	11:05	3	WNW	3	8	0	0	0

Date	VP No.	Start time	Stop Time	Time (Hrs)	Wind Direction	Wind speed	Cloud cover	Rain	Snow	Frost
10-Aug-22	3	18:04	21:04	3	W	1	0	0	0	0
10-Aug-22	3	14:30	17:30	3	SW	2	0	0	0	0
25-Aug-22	3	13:50	16:50	3	SW	3	4	0	0	0
24-Aug-22	3	09:35	12:35	3	SSW	2	8	2	0	0
22-Aug-22	3	09:45	12:45	3	SE	1	8	2	0	0
22-Aug-22	3	13:15	16:15	3	SE	2	8	0	0	0
24-Aug-22	3	06:05	09:05	3	SSW	2	8	2	0	0
28-Sep-22	3	07:14	10:14	3	NW	2	1	6	0	0
28-Sep-22	3	10:44	13:44	3	NW	0	0	0	0	0
16-Oct-22	3	07:46	10:46	3	SSE	4	6	0	0	0
16-Oct-22	3	11:16	14:16	3	SSE	4	6	0	0	0
06-Nov-22	3	07:32	10:32	3	SE	4	5	1	0	0
06-Nov-22	3	11:02	14:02	3	SE	3	6	0	0	0
14-Dec-22	3	08:38	11:38	3	WNW	0	1	0	1	2
14-Dec-22	3	12:08	15:08	3	NW	0	0	0	1	2
23-Feb-23	3	11:38	14:38	3	W	2	6	0	0	0
23-Feb-23	3	15:08	18:08	3	W	3	8	0	0	0
26-Mar-23	3	13:41	16:41	3	NE	3	8	0	0	0
26-Mar-23	3	17:11	20:11	3	NE	3	8	1	0	0

Meteorological Key:

Wind speed	Cloud cover	Rain	Snow	Frost
calm = 0 light air = 1 Light breeze = 2 Gentle Breeze = 3 Mod. Breeze = 4 fresh breeze = 5 strong breeze = 6 mod. gale = 7 fresh gale = 8 strong gale = 9	In eighths e.g 0/8 = no cloud 8/8 = full cloud cover	None = 0 Occasional=1 Drizzle / mist = 2 Light shower = 3 Heavy shower = 4 Heavy rain = 5	None = 0 On Site = 1 Snowing = 2	None = 0 Ground = 1 All day = 2

Table A3 - Summary of Target Species Flight Time: N Development

Species	Flights	Total No birds	Sum of Duration (Seconds)	HB1 0-20m	HB2 20-40m	HB3 40-80m	Sum of HB4 80-230	Sum of HB5 230+
Common Sandpiper	2	2	84	84				
Curlew	7	8	280	128	30	122		
Golden Plover	3	13	290		30	30	230	
Goshawk	4	4	283		251	32		
Greylag Goose	2	15	144		24	30	90	
Hen Harrier	1	1	14	14				
Osprey	1	1	176				176	
Peregrine	2	2	373				373	
Pink-footed Goose	19	884	2400		15	453	1221	711
Red Kite	4	4	782	79	30	582	91	
Woodcock	1	1	10	10				
Whooper Swan	1	12	147			147		

Table A4 - Summary of Target Species Flight Time: S Development

Species	Flights	Total No birds	Sum of Duration (Seconds)	HB1 0-20m	HB2 20-40m	HB3 40-80m	Sum of HB4 80-230	Sum of HB5 230+
Black Grouse	1	1	82		82			
Curlew	33	84	1450	855	322	143	130	
Golden Plover	1	34	39	39				
Greylag Goose	6	146	548	60	75	285	128	
Hen Harrier	2	2	129	15	82	32		
Lapwing	9	27	692	568	109	15		
Merlin	4	5	201	144	45	12		
Oystercatcher	13	22	725	388	259	44	34	
Peregrine	7	7	707		257	450		
Pink-footed Goose	5	280	615			180	435	
Red Kite	2	2	86	26	60			
Woodcock	1	1	54	54				

Flight Data (N Development Only) – SPA qualifying species

Table A5 – Hen harrier

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
08-Jan-23	10	1	F	09:55	14	14				

Table A6 – Peregrine

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
08-Feb-23	9	1	U	15:02	146				146	
13-Aug-23	9	1	F	13:01	227				227	

Table A7 – Golden plover

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
06-Apr-23	10	8	U	19:04	118				118	
19-Apr-23	11	2	U	06:42	60		30	30		
13-Aug-23	9	3	U	10:20	112				112	

Flight Data – Other species

Table A8 – Common sandpiper

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
07-Jul-22	11	1	U	06:04	45	45				
28-May-23	11	1	U	19:31	39	39				

Table A9 – Curlew

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
17-May-22	11	1	U	15:24	30	15	15			
02-Jul-22	9	1	U	11:10	30	15	15			
06-Apr-23	10	2	U	14:06	78			78		

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
28-May-23	11	1	U	18:53	43	43				
17-Jun-23	11	1	U	09:12	24	24				
17-Jun-23	11	1	U	09:40	31	31				
18-Jun-23	9	1	U	11:38	44			44		

Table A10 – Goshawk

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
07-Apr-22	11	1	U	15:15	60		60			
14-Sep-22	10	1	M	07:57	77		45	32		
23-Oct-22	9	1	U	08:10	107		107			
17-Jun-23	11	1	F		39		39			

Table A11 – Greylag goose

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
19-Apr-23	11	1	U	10:16	120			30	90	
08-Jan-24	12	14	U	12:48	24		24			

Table A12 – Osprey

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
06-Apr-23	10	1	U	17:25	176				176	

Table A13 – Pink-footed goose

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
02-Oct-22	11	34	U	07:53	76			45	31	
02-Oct-22	11	3	U	10:58	92		15	77		
18-Oct-22	11	54	U	08:22	76			76		
18-Oct-22	11	21	U	08:49	63			63		

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
23-Oct-22	9	120	U	09:15	198				198	
05-Mar-23	10	64	U	07:55	156					156
05-Mar-23	10	25	U	08:20	200				200	
18-Apr-23	12	61	U	06:55	120					120
18-Apr-23	12	111	U	07:37	120				90	30
18-Apr-23	12	92	U	07:42	150			60	90	
14-Sep-23	11	18	U	07:03	54				54	
14-Sep-23	11	39	U	07:19	70				70	
17-Sep-23	9	28	U	07:45	116					116
17-Sep-23	9	44	U	08:08	225					225
17-Sep-23	9	37	U	08:14	64					64
11-Oct-23	11	29	U	08:06	132			132		
08-Jan-24	12	18	U	09:58	102				102	
08-Jan-24	10	70	U	12:43	172				172	
05-Feb-24	10	16	U	10:56	214				214	

Table A14 – Red kite

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
14-Sep-22	10	1	U	11:23	286			286		
23-Oct-22	9	1	U	13:22	236			236		
05-Feb-23	10	1	U	15:03	109	79	30			
05-Mar-23	10	1	U	12:22	151			60	91	

Table A15 – Whooper swan

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
24-Oct-22	10	12	U	16:47	147			147		

Table A16 – Woodcock

Date	VP	No	Sex	Time	Duration	HB1 0- 20m	HB2 20- 40m	HB3 40- 80m	Sum of HB4 80-230	Sum of HB5 230+
05-Feb-23	10	1	U	17:28	10	10				

Annex B: Breeding bird survey results

Table B4 Breeding bird survey results summary

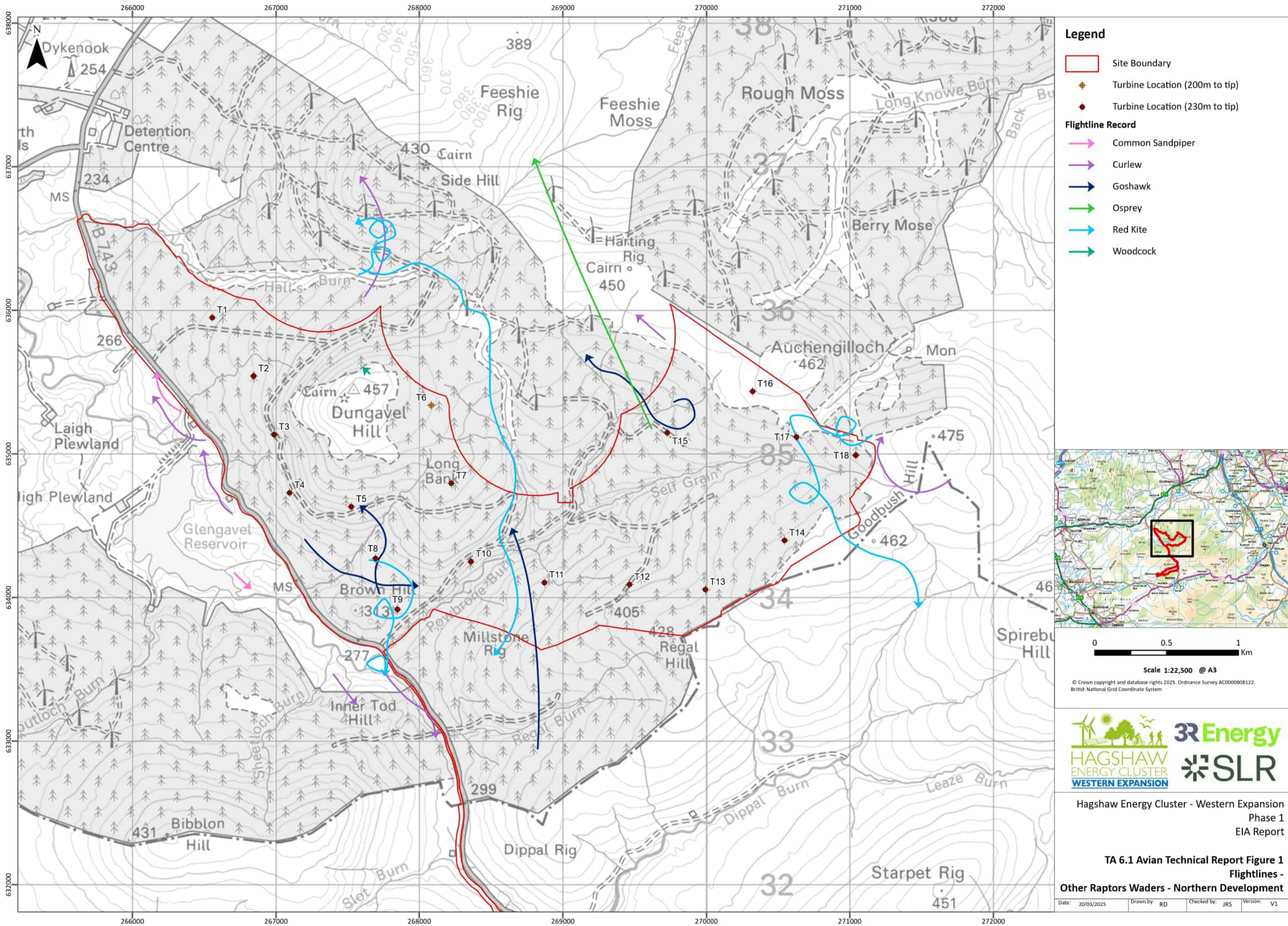
Common Name	Scientific Name	BTO Code	Notes
Schedule 1 Raptors – evidence of breeding			
Peregrine	Falco peregrinus	PE	Confirmed breeding outside Site
Red Kite	Milvus milvus	KT	Confirmed breeding outside Site
Schedule 1 Raptors –no evidence of breeding			
Merlin	Falco columbarius	ML	Occasional records in breeding season – not evidence of breeding
Goshawk	Accipiter gentilis	GI	Occasional records in breeding season – not evidence of breeding
Target Waders			
Common sandpiper	Actitis hypoleucos	CS	Breeding along watercourses
Curlew	Numenius arquata	CU	Widespread breeder in heath and grassland
Lapwing	Vanellus vanellus	L.	Breeding in lowland farmland
Oystercatcher	Haematopus ostralegus	OC	Breeding in lowland farmland
Snipe	Gallinago gallinago	SN	Widespread breeder in heath and wet grassland
Other Schedule 1 species			
Crossbill	Loxia curvirostra	CR	Common breeder in plantation woodland
BoCC Red listed species			
Cuckoo	Cuculus canorus	CK	Occasional record.
Grasshopper warbler	Locustella naevia	GH	Occasional record in wet grassland.
Greenfinch	Carduelis chloris	GR	Occasional record.
House Sparrow	Passer domesticus	HS	Records associated with buildings
Linnet	Linaria cannabina	LI	Common in scrub habitats in south Development.
Lesser Redpoll	Acanthis cabaret	LR	Common around woodland.
Mistle Thrush	Turdus viscivorus	M.	Common in woodland.
Skylark	Alauda arvensis	S.	Common and widespread in open areas.
Spotted Flycatcher	Muscicapa striata	SF	Occasional records on woodland edges.
Starling	Sturnus vulgaris	SG	Records associated with buildings
Tree Pipit	Anthus trivialis	TP	Occasional records on woodland edges.

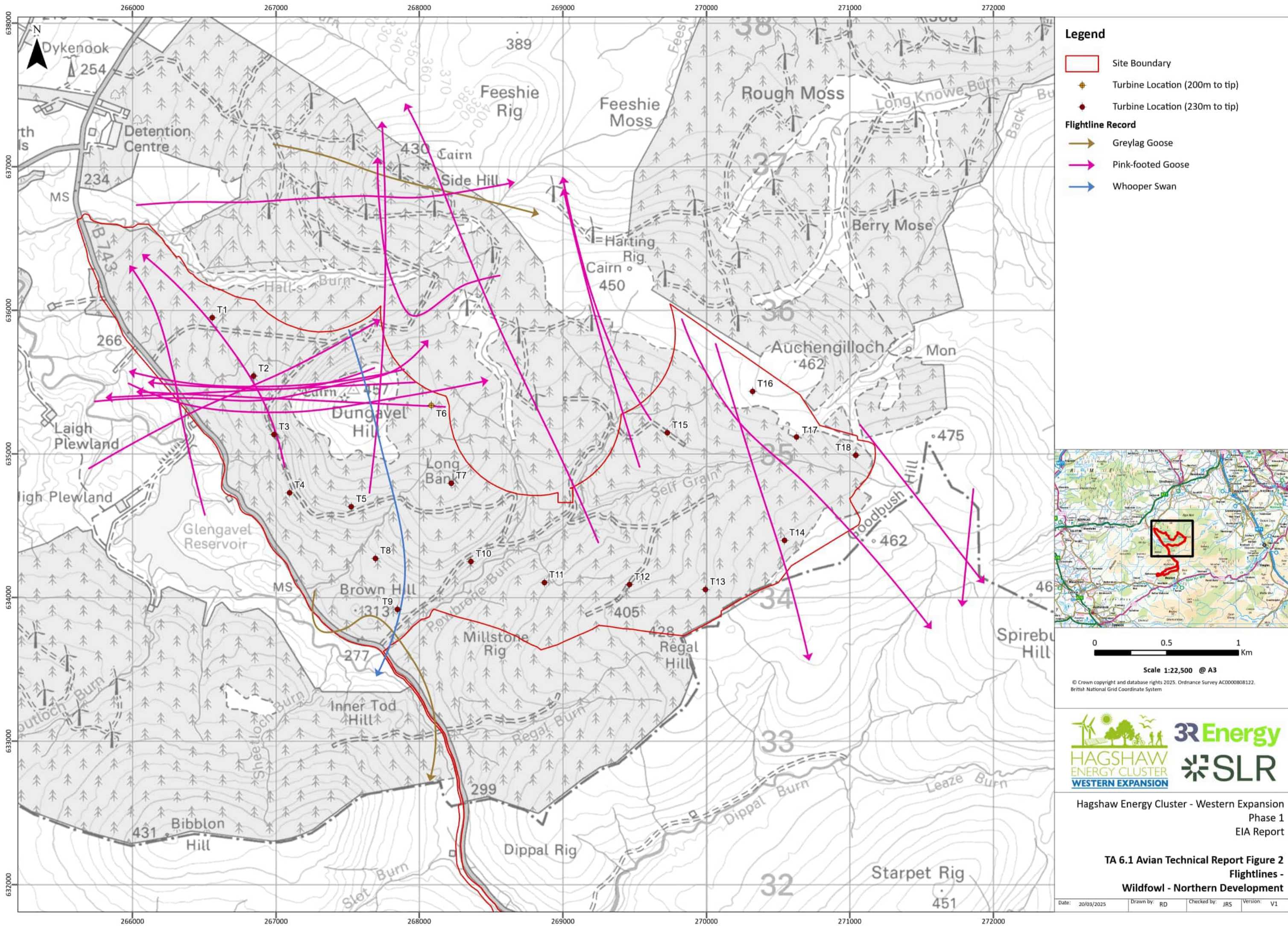
Whinchat	Saxicola rubetra	WC	Occasional record.
Yellowhammer	Emberiza citrinella	Y.	Single record in southern development.
BoCC Amber listed species			
Bullfinch	Pyrrhula pyrrhula	BF	Occasional record.
Dunnock	Prunella modularis	D.	Common in woodland.
Dipper	Cinclus cinclus	DI	Occasional record on watercourses.
Grey Wagtail	Motacilla cinerea	GL	Records associated with buildings.
House Martin	Delichon urbicum	HM	Records associated with buildings
Mallard	Anas platyrhynchos	MA	Records associated with buildings.
Meadow Pipit	Anthus pratensis	MP	Common and widespread in open areas.
Reed Bunting	Emberiza schoeniclus	RB	Occasional records in wet grassland.
Stock Dove	Columba oenas	SD	Single record in woodland.
Sand Martin	Riparia riparia	SM	Recorded along watercourses.
Song Thrush	Turdus philomelos	ST	Common in woodland.
Wheatear	Oenanthe oenanthe	W.	Single record.
Woodpigeon	Columba palumbus	WP	Common in woodland.
Wren	Troglodytes troglodytes	WR	Common and widespread in riparian, woodland habitats.
Willow Warbler	Phylloscopus trochilus	WW	Common and widespread in riparian, woodland habitats.
BoCC Green Listed species			
Buzzard	Buteo buteo	BZ	Regular breeder in woodland.
Chiffchaff	Phylloscopus collybita	CC	Common breeder in woodland
Chaffinch	Fringilla coelebs	CH	Common and widespread in woodland
Coal Tit	Parus ater	CT	Common and widespread in woodland
Goldcrest	Regulus regulus	GC	Common and widespread in woodland
Goldfinch	Carduelis carduelis	GO	Common breeder in woodland
Great Tit	Parus major	GT	Common breeder in woodland
Garden warbler	Sylvia borin	GW	Occasional record in woodland
Long-tailed Tit	Aegithalos caudatus	LT	Occasional record in woodland
Robin	Erithacus rubecula	R.	Common and widespread in woodland
Pied Wagtail	Motacilla alba	PW	Common around buildings and watercourses
Robin	Erithacus rubecula	R.	Common and widespread in woodland
Stonechat	Saxicola rubicola	SC	Occasional record in grassland
Sparrowhawk	Accipiter nisus	SH	Single record
Siskin	Spinus spinus	SK	Common and widespread in woodland
Treecreeper	Certhia familiaris	TC	Occasional record in woodland

Other and Non-breeding Species			
Carrion Crow	Corvus corone	C.	-
Greater Canada Goose	Branta canadensis	CG	-
Common Gull	Larus canus	CM	-
Jay	Garrulus glandarius	J.	-
Jackdaw	Corvus monedula	JD	-
Lesser Black-backed Gull	Larus fuscus	LB	-
Raven	Corvus corax	RN	-
Swallow	Hirundo rustica	SL	-

Figures

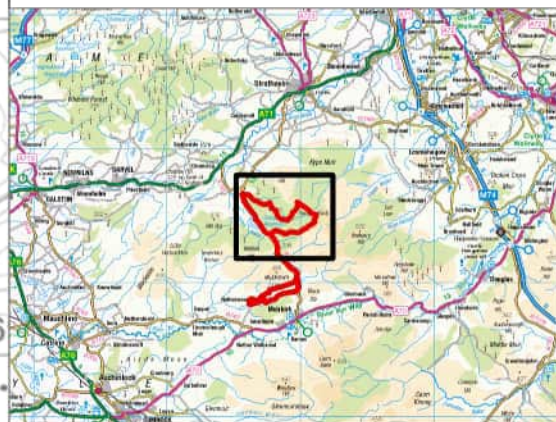






Legend

- Site Boundary
- Turbine Location (200m to tip)
- Turbine Location (230m to tip)
- Flightline Record**
- Greylag Goose
- Pink-footed Goose
- Whooper Swan



0 0.5 1 Km

Scale 1:22,500 @ A3

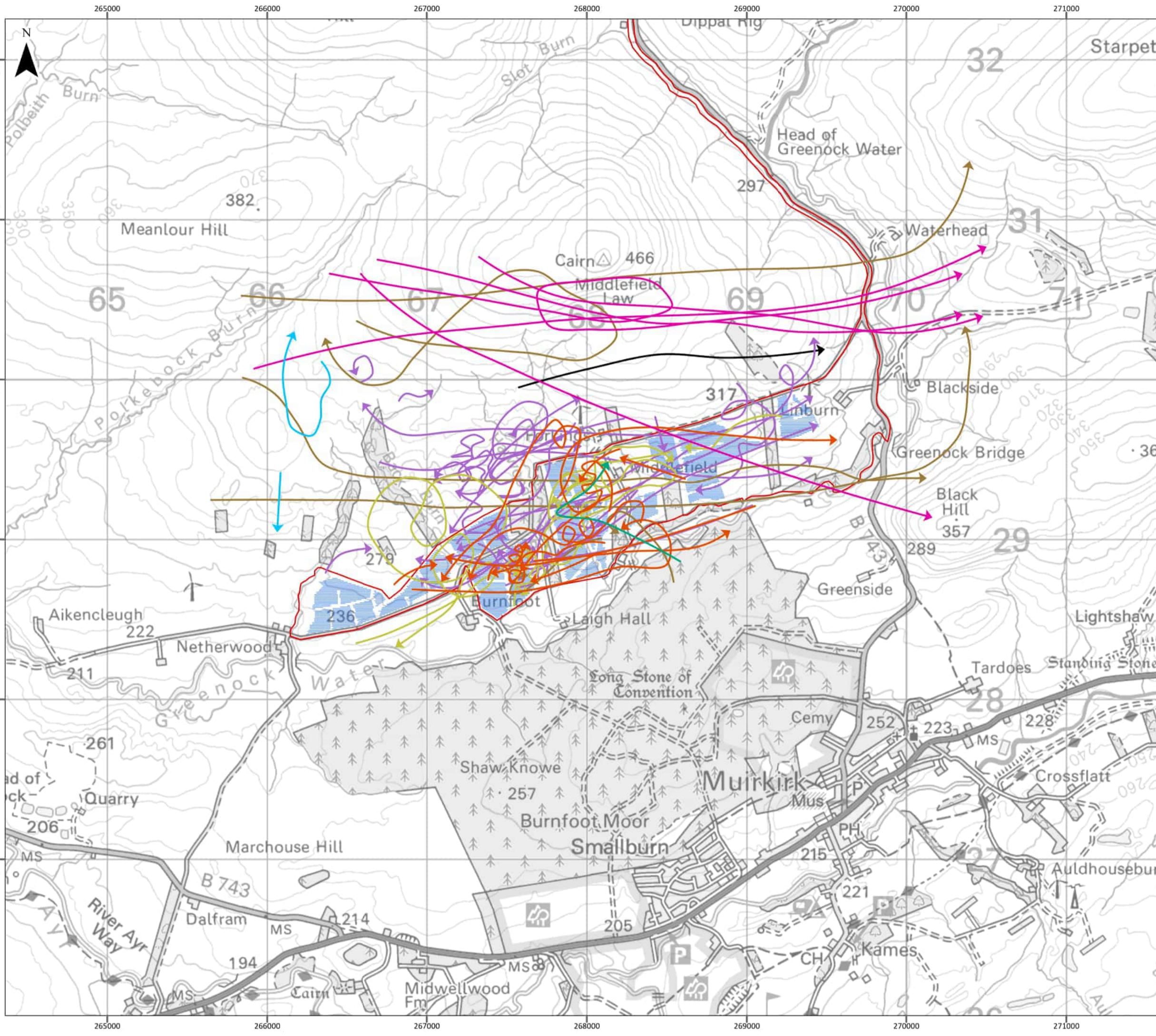
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Hagshaw Energy Cluster - Western Expansion
Phase 1
EIA Report

TA 6.1 Avian Technical Report Figure 2
Flightlines -
Wildfowl - Northern Development

Date: 20/03/2025	Drawn by: RD	Checked by: JRS	Version: V1
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Legend

Site Boundary

Solar PV Module

Flightline Record

Black Grouse

Curlew

Greylag Goose

Lapwing

Oystercatcher

Pink-footed Goose

Red Kite

Woodcock

0 0.5 1 Km

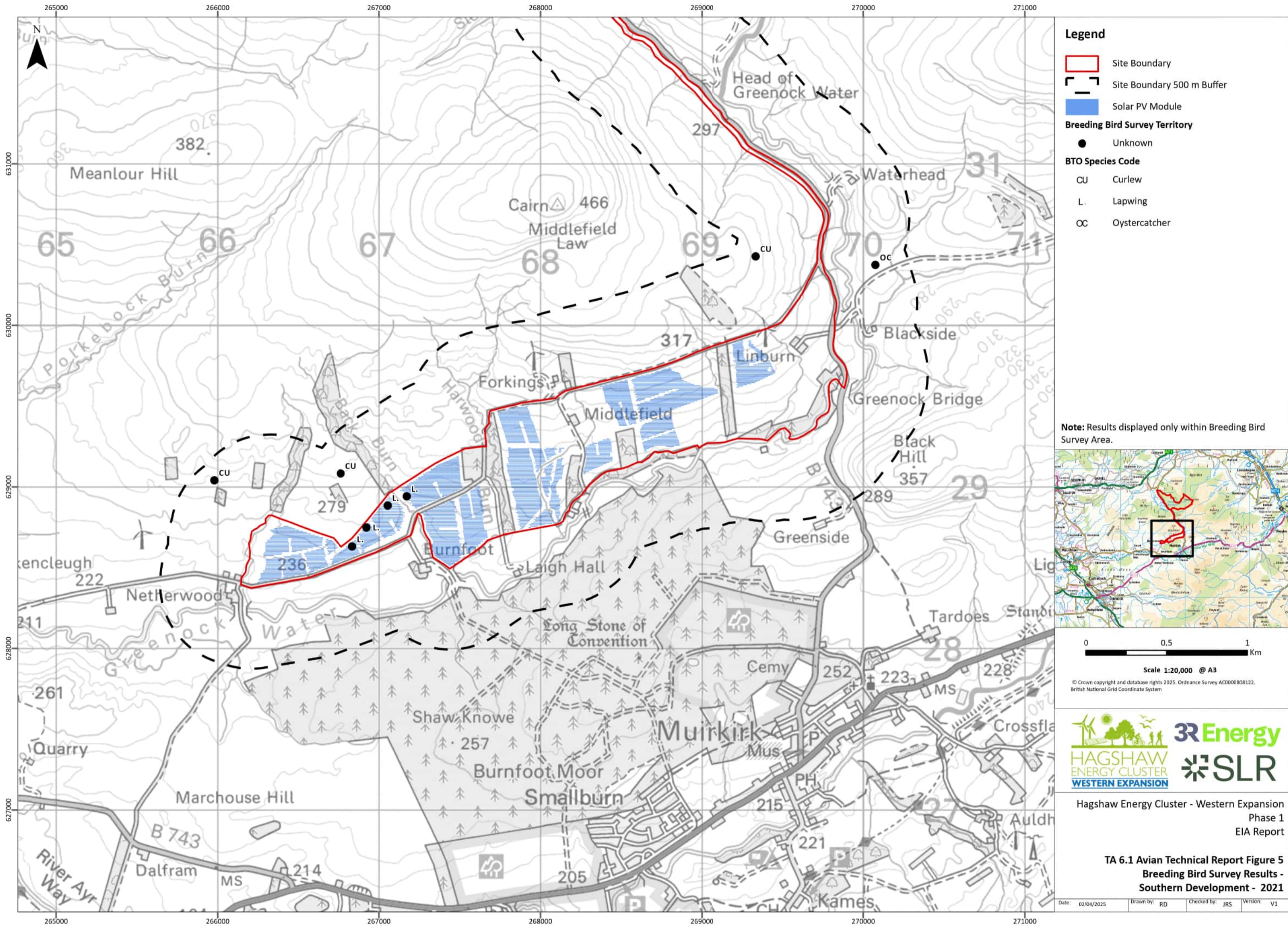
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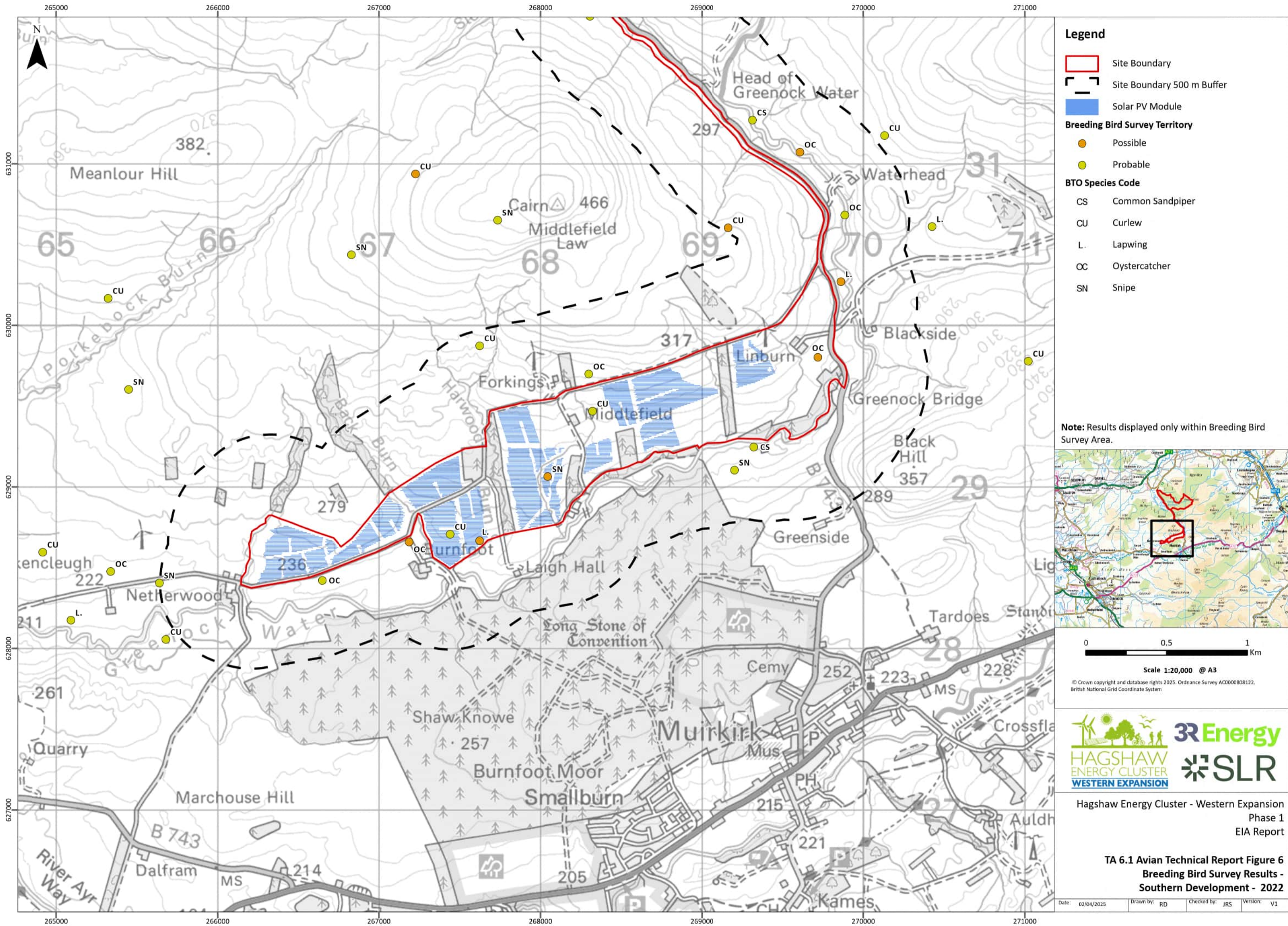
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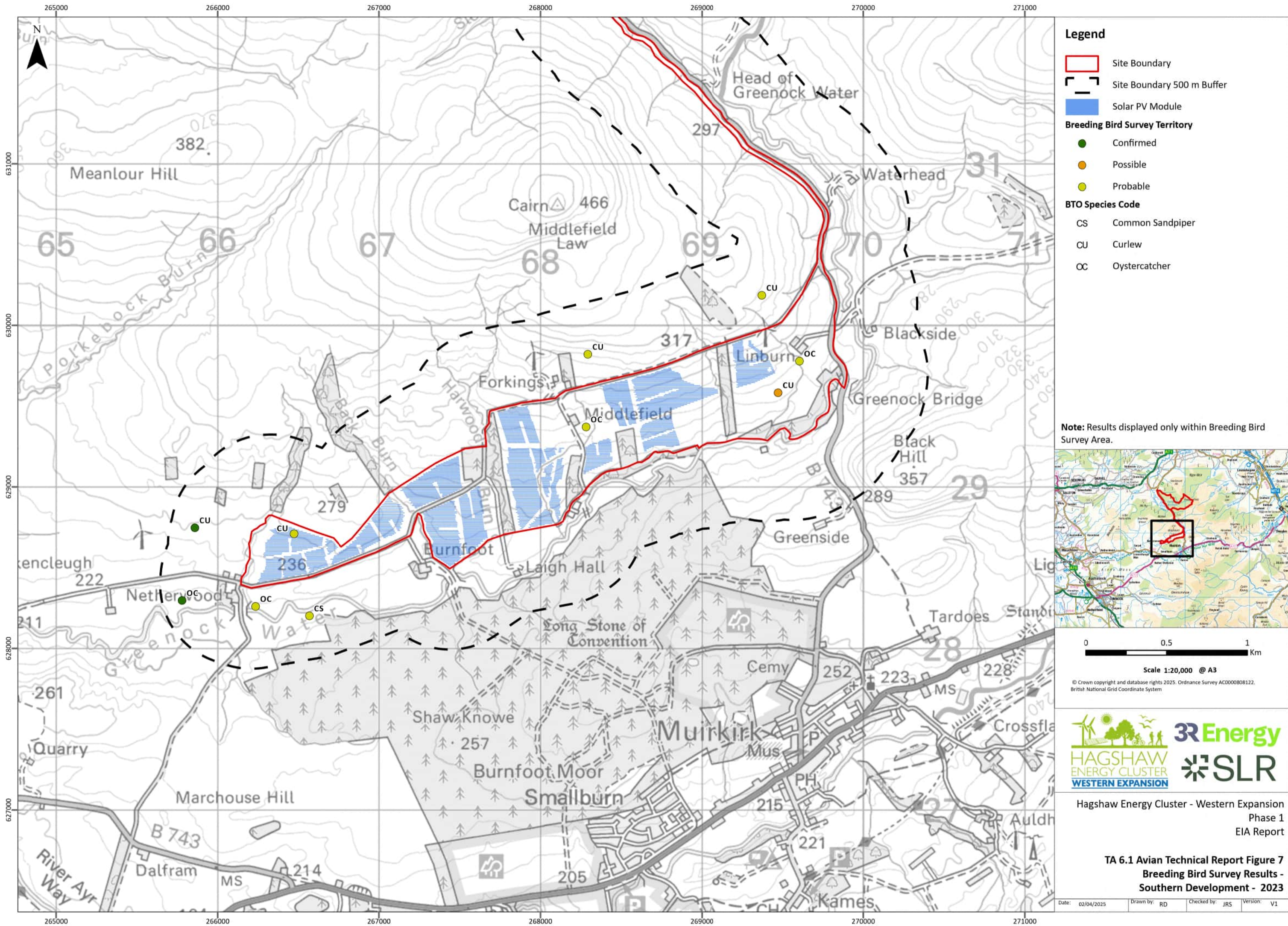
Hagshaw Energy Cluster - Western Expansion
Phase 1
EIA Report

TA 6.1 Avian Technical Report Figure 3
Flightlines -
Other Species - Southern Development

Date:	20/03/2025	Drawn by:	RD	Checked by:	JRS	Version:	V1
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Legend

- Site Boundary
- Site Boundary 500 m Buffer
- Solar PV Module

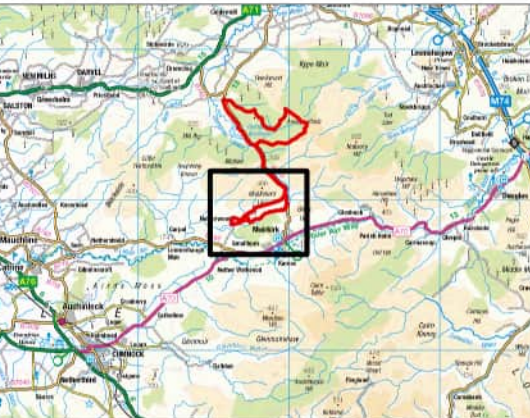
Breeding Bird Survey Territory

- Confirmed
- Possible
- Probable

BTO Species Code

- CS Common Sandpiper
- CU Curlew
- OC Oystercatcher

Note: Results displayed only within Breeding Bird Survey Area.



0 0.5 1 Km

Scale 1:20,000 @ A3
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Hagshaw Energy Cluster - Western Expansion
Phase 1
EIA Report

**TA 6.1 Avian Technical Report Figure 7
Breeding Bird Survey Results -
Southern Development - 2023**

Date: 02/04/2025 Drawn by: RD Checked by: JRS Version: V1