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Ecological Impact Assessment

Burngullow turbine

December 2023

A report by

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Report details

Site name:	Burngullow turbine
Grid reference:	SW 983 541
Report date:	14th December 2023
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Declaration of compliance

BS 42020:2013

This study has been undertaken in accordance with British Standard 42020:2013 Biodiversity, Code of Practice for Planning and Development.

Code of Professional Conduct

The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Validity of survey data and report

The findings of this report are valid for 24 months from the date of the supporting surveys.

Table of contents

1. Introduction

1.1. Background

Western Ecology has been commissioned to complete an Ecological Impact Assessment for a single wind turbine at Burngullow Common.

1.2. Purpose of this report

A preliminary ecological walkover of the site was completed in February 2022 and updated in June 2023.

A reptile survey, breeding bird and summer vantage point surveys were completed along with seasonal bat activity transects and remote monitoring.

This report presents the ecological information relating to valued ecological receptors obtained during these surveys and the desk-study, assesses the significance of the effects of the proposed development on these features, and sets out proposed mitigation measures.

This report also assesses the effect of changes in habitat management and additional plantings associated with the development.

This report is intended to be used to inform consultees of the potential ecological impacts and proposed mitigation in relation to this development.

1.3. Site location

The site lies at the eastern edge of Blackpool pit, a disused china clay quarry, located approximately 1.2km to the north-west of the village of Trewoon and approximately 3.6km to the north west of St Austell.

2. Assessment methodology

2.1. Development site and Zone of Influence

The Development Site is shown on Map 1 and includes all areas within the planning application boundary and any immediately adjacent areas that may be affected by the proposed development.

The Zone of Influence for the purpose of this assessment is immediate habitats that will be potentially impacted by these proposals, non-statutory nature conservations sites within 2km, and statutory designated sites within 5km unless they have been designated for species at risk of wind turbines whereby the have been considered within 10km.

Biological records for protected/notable species birds, bats and dormice were also considered.

2.2. Ecological baseline

The ecological baseline for the development site are:

- desktop survey;
- preliminary ecological appraisal;
- bird vantage point surveys;
- breeding bird surveys;
- Nightjar surveys
- bat activity surveys; and
- reptile survey;

2.3. Site surveys

Desktop survey

The desktop survey collated existing biological records and identified any nature conservation sites that may be affected by the proposals. This comprises an important part of the assessment process, providing information on ecological issues that may not be apparent during the site survey.

The desktop survey identified any statutory nature conservation sites that may be affected by the proposals. This comprises an important part of the assessment process, providing information on ecological issues that may not be apparent during the site survey.

Consultees for the data search included:

- The Environmental Records Centre for Cornwall & the Isle of Scilly provided biological records for protected/notable species and non-statutory sites within 1km of the site, and bats and notable birds within 5km.
- Natural England - GIS dataset of SSSI Impact Risk Zones, statutory nature conservation sites, Priority Habitats and locations of granted EPSL's.

The location of nature conservation sites was examined to determine their ecological and landscape relationships with the proposed site. An assessment was then made of how the

sites may be affected by the proposal, taking into account these relationships, and the species and/or habitat types for which the nature conservation site was chosen.

SSSI Impact Risk Zones are areas where the proposed planned change to the environment could either create significant damage to a local SSSI, or might require additional planning and consultation in order to avoid impacting such sites. The assessments are made according to the particular sensitivities of the features for which the SSSI is notified, and specifies the types of development that have the potential for adverse impacts.

In compliance with the terms and conditions relating to its commercial use, the full desk study data is not provided within this report.

Preliminary Ecological Appraisal

A Preliminary Ecological Appraisal of the site was completed by James Gilroy BSc (Hons), MSc.

The survey was completed on 26th June 2023 between 12:15 and 13:30 with an air temperature of 20°C, a moderate westerly breeze, dry conditions and with 60-80% cloud cover.

Habitats were classified using the Phase 1 Habitat Survey methodology developed by the Joint Nature Conservation Committee (JNCC, 2010) and modified by the Institute of Environmental Assessment (IEA, 1995). The main plant species were recorded and broad habitat types mapped according to the UK Habitats Classification definitions (UK Habitat Classification Working Group, 2018). Habitats encountered are described within the Results section, with a map included within the report. Plant species were identified according to Stace (1997).

Breeding bird surveys

Vantage point

A series of Vantage Point Surveys (VPs) have been completed between July and August 2021, and then between March to June in 2022 to capture bird movements during the accepted breeding season (March to August inclusive). The survey methodology followed that given by Scottish Natural Heritage (SNH, 2000) in their guidance ‘Recommended bird survey methods to inform impact assessment of onshore wind farms’.

The target bird species for the VPs were based on those species which are identified by *Natural England Technical Information Note 069 (TIN 069) – Assessing the effects of onshore wind farms on birds*. Other notable raptor, wildfowl and wader species were also included, with particular attention paid to species within these groups for which there are records within 5km of the Site, as provided by the ERCISS record search

Wind turbine collision risk for target species has been estimated using the method outlined in the Scottish Natural Heritage (SNH) guidance note on calculating theoretical collision risk (SNH, 2000) and developed by Band et al. (2007). Estimates of collision risk have been calculated for observed target species where there was sufficient data to carry out the analysis.

Species that are not included in the collision risk analysis are either not of conservation concern or are at low collision risk due to their flight behaviour, and/or are species which are infrequently present within the study area.

Nightjar

Nightjar surveys comprised a walked transect across the site and immediate surroundings. This transect route gave optimal coverage of the Site, allowing any potential Nightjar to be clearly seen displaying or heard churring.

Following standard RSPB guidelines, surveys were carried out in the period mid-May to late June, between 30 mins before sunset to 1.5 hours after sunset and in suitable weather conditions (dry and wind less than Beaufort 3)

Breeding birds

Breeding Bird Surveys (BBS) were completed in April, May and June 2022 using a methodology based upon a combination of Common Bird Census methodology, devised by the British Trust for Ornithology (BTO), and the national Breeding Bird Survey (BBS) techniques, jointly devised by the BTO, Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee.

This involved a suitably experienced surveyor slowly walking a predetermined transect and recording all birds seen or heard onto pre-printed maps using BTO codes and symbols to describe species present and associated activity.

Bat activity surveys

Transects

Three 2-hour bat activity transects were completed in Summer and Autumn 2021, and Spring 2022 by a suitably experienced ecologist walking a pre-planned route through this site, with attention being paid to bat activity along boundary features . The survey began about 15 minutes before sunset. At locations along the route the surveyor paused to record bat activity in that area making a note of any bat species encountered, number of passes and any other pertinent information.

Remote monitoring

Two Wildlife Acoustics remote bat monitors (SM Mini's) were deployed onto site for 10 days each in Summer and Autumn 2021, and Spring 2022, placed at the proposed turbine location (TL) and at linear features in the landscape. Two locations were used for the linear feature as the initial site (LF1) was found to have been managed, but since the Cat-scan had been completed an alternative could not be chosen at short notice. After this period, it was relocated to LF2. These were set to record in the period 30 minute before sunset until 30 minutes after sunrise.

All units were approximately 1.5 -2 metres above the ground. Following deployment, calls were analysed with Kaleidoscope pro (v5.6.0c) with calls for rarer species, such as barbastelle, visually checked for correct identification. Auto ID classifiers was set to 'Balanced' and Bats of Europe 5.4.0. The minimum number of pulses for a pass was set to 2.

Reptile survey

44 artificial reptile refugia comprising 50cm x 50cm squares of bitumen roofing felt were placed at the across the site and surrounding areas on 1st April 2022. The total surveyed area was approximately 1ha of suitable habitat.

After an approximately 2 week settling period, these refugia were inspected on seven separate occasions for concealed reptiles, either in the morning or late afternoon/early evening, whilst adjacent areas were searched for basking or feeding reptiles. If reptiles were found, their age class was estimated and adults were sexed.

2.4. Limitations

Preliminary ecological appraisal

All areas of the assessment site were readily accessible during the survey. However, it must be realized that surveys only provide a snapshot of a site at a given time.

Although some plant species would have not been visible during the preliminary ecological appraisal, this is not considered a significant constraint as the site comprises managed agricultural land of little botanical value.

Vantage point survey

Government Guidelines on survey effort for summer bird surveys are given as 36 hrs per season, with the summer (breeding) survey period being March to August (2 surveys per month). The May VP1 survey had to be abandoned 30mins early, however this was added on to the next survey, so the full 36hrs of survey effort was met. The May VP2 survey had to be postponed into early June. This is not considered a constraint to the survey as full survey effort was still met, and within the wider breeding season (March to August).

3. Impact assessment method

The assessment of impacts has been carried out in accordance with the principles described by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018[1]).

The ecological feature or resource that is affected by an impact is referred to as the receptor. Impacts are considered in terms of the value of the receptor in the context of nature conservation, and the character of the impact. From these the significance of the impact is determined.

As part of the impact assessment, the available means to avoid, minimise or mitigate for adverse impacts are incorporated into the design, so that the final impact assessment identifies the residual (net) impacts that are predicted. The consequences for development control, policy guidance and legislative compliance can then be identified.

3.1. Method for valuation of receptors

The ecological value of habitats present is provided in line with Guidelines for Ecological Impact Assessment (CIEEM, 2018), and those which are important in terms of legislation or policy are identified. Table 1 summarises this information and details the extent of each habitat recorded here.

The nature conservation value, or potential value, of the habitat is determined within the following geographic context:

- International importance (e.g. internationally designated sites such as Special Areas of Conservation, Special Protection Areas, Ramsar sites);
- National importance (e.g. nationally designated sites such as Sites of Special Scientific Interest or species populations of importance in the UK context);
- County importance (e.g. SNCI, habitats and species populations of importance in the context of Cornwall);
- Local importance (e.g. important ecological features such as old hedges, woodlands, ponds);
- Site importance (e.g. habitat mosaic of grassland and scrub which may support a diversity of common wildlife species);
- Negligible importance. Usually applied to areas such as built development or areas of intensive agricultural land.

The examples are not exclusive and are subject to further professional ecological judgment.

[1] CIEEM, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Technical Guidance Series.* Chartered Institute of Ecology and Environmental Management, 43 Southgate Street, Winchester, Hampshire.

3.2. Impact Assessment Criteria

The assessment of potential impacts arising due to the development considers on-site impacts (i.e. within the footprint of the works) and those that may occur to adjacent and more distant ecological features.

Potential effects on valued receptors, adverse or positive, are identified for both the construction and operational phases. The effects are then assessed and characterised according to the following criteria:

- Direction (positive, adverse, or neutral)
- Magnitude of impact
- Spatial extent over which the impact would occur
- The temporal duration of the impact
- Permanence
- Frequency and timing
- Potential for cumulative effects.

The assessment identifies any information gaps and any uncertainties that may be material in the confidence of predicting effects. Confidence in predictions is given as:

- Certain/near-Certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely Unlikely: probability estimated at less than 5%.

The precautionary principle is applied whenever there is substantial doubt. The impact timescale is given as:

- Acute, immediate, and discrete;
- Short-term: 0-3 years;
- Medium term 3-10 years; and
- Long term: 10 years +.

Effects include, but are not restricted to:

- loss or change of habitat;
- disturbance during construction, operation, and decommissioning;
- chemical effects form airborne pollutants
- contravention of legal status or protection (including where the receptor would not meet or exceed the value threshold).

For the purposes of this assessment the significance of the effect is determined using the matrix in Table 1 where the scale of the effect is measured against the value of the receptor.

Ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. For the purposes of this assessment the effects that are identified in red shaded cells are significant.

Table 1. Matrix for assessment of significance of effect

Scale of effect	Evaluation of nature conservation receptor				
	Very high/ International	**High/ national**	**Medium/ regional**	**Low/ local**	**Negligible/site only**
Major positive effect	Large positive	Large positive	Large positive	Large positive	Large positive
Intermediate positive effect	Moderate positive	Moderate positive	Moderate positive	Moderate positive	Moderate positive
Minor positive effect	Slight positive	Slight positive	Slight positive	Slight positive	Slight positive
Neutral	None	None	None	None	None
Minor negative effect	Slight adverse	Slight adverse	Slight adverse	Slight adverse	None
Intermediate negative effect	Large adverse	Large adverse	Moderate adverse	Slight adverse	None
Major negative effect	Very large adverse	Very large adverse	Large or moderate adverse	Slight adverse	None

European Protected Sites– definition of significance of effect

For a European Protected Site the integrity of a site is:

> 'the coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.'

Disturbance should not have a significant effect on the integrity of a European Protected Site.

3.3. Mitigation

Where there is potential that the proposed development will have a significant effect on a valued ecological feature of nature conservation interest, recommendations for mitigation are made based on the mitigation hierarchy suggested in Paragraph: 018 Reference ID: 8-018-20140306 of National Planning Practice Guidance;

- Avoidance –significant harm to wildlife species and habitats should be avoided through design.
- Mitigation – where significant harm cannot be wholly or partially avoided, it should be minimised by design, or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations.
- Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, this should be properly compensated for by measures to provide for an equivalent value of biodiversity. 4.

4. Legislation and Policy used to assess ecological receptors

4.1. Planning policy

National Planning Policy Framework, 2021

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It contains a number of policies relating to ecology including "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures".

Section 15 Conserving and enhancing the natural environment includes the following:

- 174. Planning policies and decisions should contribute to and enhance the natural and local environment by:
  a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
  b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
  c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
  d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
  e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
  f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
- 175. Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework53; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
- 180. When determining planning applications, local planning authorities should apply the following principles:
  a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity

National Planning Practice Guidance 2014

This online resource provides guidance on the Natural Environment and its place with the planning process, including:

- The statutory basis through which planning should seek to minimise impacts on biodiversity and provide net gains in biodiversity where possible.
- How local planning authorities should set about planning for biodiversity and geodiversity.
- Information on ecological networks
- Evidence based ecology
- The legal obligations on local planning authorities and developers regarding European sites designated under the Birds or Habitats Directives, protected species and Sites of Special Scientific Interest
- Why Local Sites are important
- Taking ecosystems services into account in planning
- Nature Improvement Areas
- Taking biodiversity into account in preparing a planning application
- How development can protect and enhance biodiversity
- What questions should be considered in applying policy to avoid, mitigate or compensate for significant harm to biodiversity
- Ensuring mitigation or compensation measures cab be delivered where significant harm to biodiversity is unavoidable.

4.2. Nature Conservation Legislation

European Habitats and Species Directive (CEC, 1992)

The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

This Act is the primary legislation that protects animals, plants and certain habitats in the UK. This includes the designation and protection of some of the best areas of natural environmental as Sites of Special Scientific Interest (SSSI).

The Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law.

The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species. These sites form a network termed Natura 2000 and include Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

Protection of Badgers Act 1992

The Protection of Badgers Act 1992 consolidated and improved previous legislation. Under the Act it is an offence to kill, injure or take a Badger, or to damage or interfere with a sett used by a Badger unless a licence is obtained from a statutory authority.

The Hedgerow Regulations 1997

The Hedgerows Regulations 1997 protect certain hedgerows from being removed (uprooted or destroyed) if they meet certain criteria.

The Countryside and Rights of Way (CRoW) Act 2000

This Act increases measures for the management and protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation.

Circular 06/2005 Biodiversity and geological conservation – statutory obligations and their impact within the planning system

This circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the national planning policy in the National Planning Policy Framework and the Planning Practice Guidance.

Natural Environment and Rural Communities Act 2006

The Act made amendments to the both the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way (CROW) Act 2000. For example, it extended the CROW biodiversity duty to public bodies and statutory undertakers.

4.3. Biodiversity strategies

UK Post-2010 Biodiversity Framework, 2012

The 'UK Post-2010 Biodiversity Framework', published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic thinking.

The natural choice: securing the value of nature (2011) (Natural Environment White Paper)
This White Paper outlines the Governments vision for the future of landscape and ecosystem services.

Biodiversity 2020
This is a national strategy for England's wildlife and ecosystem services based on the White Paper.

5. Ecological baseline

5.1. Desktop Study

The biological records search found a number of notable species. Due to the broad scale of many records, it is not possible to determine if they relate to the Site. Records for notable species (excluding bat and birds) are detailed in Table 2.

Table 2 – Records of notable species (excluding bats and birds) within 1km of the Site

Group	Species	Number of records within 1km (5km for bats)
Amphibians	No records	
Terrestrial mammals	Badger	2
	West European Hedgehog	1
Reptiles	Common Lizard	2
	Grass Snake	1
	Slow Worm	2
Plants	Bluebell	6
	Western Rustwort	8

Bats

The biological record search returned 363 records for bat species within 5km of the Site and these area detailed Table 3.

Table 3 – Records of bat species within 5km of the Site

Common Name	UK Legislation	Conservation Status	No. of records
Unidentified bat (Chiroptera spp.)	WACA-Sch5[2]		1
Brandt's bat	WACA-Sch5	Local priority[3]	2
Brown Long-eared Bat	WACA-Sch5; NERC S41[4]	Priority[5]; local priority	41
Common Pipistrelle	WACA-Sch5	Local priority	24
Daubenton's Bat	WACA-Sch5	Local priority	1
Greater Horseshoe Bat	WACA-Sch5; HabReg-Sch2[6]; NERC S41	Priority; local priority	5
Lesser Horseshoe	WACA-Sch5; HabReg-Sch2; NERC S41	Priority; local priority	22
Leisler's Bat	WACA-Sch5; HabReh-Sch2	Priority	1
Nathusius's Pipistrelle	WACA-Sch5; HabReh-Sch2	Priority	1
Natterer's Bat	WACA-Sch2	Local priority	4
Noctule bat	WACA-Sch5; NERC S41	Priority, local priority	11
Pipistrelle spp.	WACA-Sch5	Local priority	214
Serotine	WACA-Sch5	Priority; local priority	2
Soprano Pipistrelle	WACA-Sch5; NERC s41	Priority; local priority	30

[2] All bat species are listed under Schedule 1 of the Wildlife and Countryside Act 1981

[3] Bat species species listed on Cornwall Red Data Book

[4] Bat species listed under Section 41 of the Natural Environment and Rural Communities Act (2006). These are the species found in England which have been identified as requiring action under the UK BAP. All local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions.

[5] Bat species listed as BAP Priority Species

[6] Bat species under Schedule 2 of The Conservation of Habitats and Species Regulations 2010

Western Barbastelle	WACA-Sch5, HabReg-Sch2; NERC S41	Priority; local priority	3
Whiskered Bat	WACA-Sch5; NERC S41	Local priority	1

Birds

The biological record search returned 14490 records for bird species within 5km of the Site. Notable species likely to be regularly active within the local area are recorded in Table 4 below.

Table 4 – Records of notable bird species within 5km of the Site

Common Name	UK Legislation	Conservation Status	No. of Records
Barn Owl	WACA-Sch1-p1[7]	Local priority[8]	71
Black Redstart	WACA-Sch1-p1	Priority[9]	25
Black-headed Gull		Priority	42
Black-necked Grebe	WACA-Sch1-p1	Priority, local priority	1
Black-throated diver	WACA-Sch1-p1	Priority, local priority	26
Brambling	WACA-Sch1-p1	Not listed	14
Bullfinch		Priority	287
Cirl Bunting	WACA-Sch1-p1, NERC S41[10]	Priority, local priority	1
Common Crossbill	WACA-Sch1-p1	Local priority	1
Common Gull		Priority	8
Common Redpoll		Priority	1
Common Sandpiper		Priority; local priority	4
Common Scoter	WACA-Sch1-p1, NERC S41	Priority, local priority	12
Corn Bunting	NERC S41	Priority; local priority	2
Cuckoo	NERC S41	Priority; local priority	81
Curlew	NERC S41	Priority, local priority	2
Dark-bellied Brent Goose	NERC S41	Priority, NE TIN069[11]	1
Dartford Warbler	WACA-Sch1-p1	Priority, local priority	12
Dunlin		Priority, local priority, NE TIN069	2
Dunnock/Hedge Accentor	NERC S41	Priority; local priority	580
Eider		Priority; local priority	4
Fieldfare	WACA-Sch1-p1	Priority; local priority	30
Firecrest	WACA-Sch1-p1	Not listed	89
Gadwall		Priority; local priority	1

[7] Bird species listed under Schedule 1 of the Wildlife & Countryside Act 1981

[8] Bird species listed on Cornwall Red Data Book

[9] Bird species on BoCC Red/Amber list (2021); BAP Priority Species

[10] Bird species listed under Section 41 of the Natural Environment and Rural Communities Act (2006). These are the species found in England which have been identified as requiring action under the UK BAP. All local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions.

[11] Target bird species on Natural England Technical Information Note 069 – Assessing the effects of onshore wind farms on birds

Glaucous Gull		Priority	1
Goldeneye	WACA-Sch1-p1	Priority	3
Goshawk	WACA-Sch1-p1	Priority, local priority	1
Grasshopper Warbler	NERC S41	Priority	16
Greater Black-backed Gull		Priority	9
Great Crested Grebe		Priority	7
Great Northern Diver	WACA-Sch1-p1	Priority, local priority	40
Greenfinch		Priority	444
Green Sandpiper	WACA-Sch1-p1	Priority, local priority	6
Grey Heron	-	NE TIN069	44
Grey Wagtail		Priority	126
Grey Partridge	NERC S41	Priority, local priority	3
Hawfinch	NERC S41	Priority	3
Hen Harrier	WACA-Sch1-p1, NERC S41	Priority, local priority, NE TIN069	4
Herring Gull	NERC S41	Priority	409
Hobby	WACA-Sch1-p1	Local priority, NE TIN069	7
Honey-buzzard	WACA-Sch1-p1	Priority	1
Hoopoe	WACA-Sch1-p1	Not listed	4
House Sparrow	NERC S41	Priority	544
Kestrel		Priority	60
Lapwing	NERC S41	Priority, local priority, NE TIN069	6
Lesser Black-backed Gull		Priority	19
Linnet	NERC S41	Priority	61
Little Egret	-	Local priority, NE TIN069	9
Long-eared Owl		Local priority	3
Long-tailed Duck	WACA-Sch1-p1	Priority	2
Mallard		Priority	59
Marsh Harrier	WACA-Sch1-p1	Priority, NE TIN069	1
Marsh Tit	NERC S41	Priority	66
Meadow Pipit	-	Priority	187
Merlin	WACA-Sch1-p1	Priority, NE TIN069	5
Mistle Thrush		Priority	39
Nightjar	NERC S41	Priority, local priority, NE TIN069	23
Osprey	WACA-Sch1-p1	Priority, NE TIN069	2
Oystercatcher		Priority	1
Peregrine	WACA-Sch1-p1	Local priority, NE TIN069	39
Pied Flycatcher		Priority	4
Pochard		Priority; local priority	7
Red Kite	WACA-Sch1-p1	Priority, local priority, NE TIN069	25
Red-backed Shrike	WACA-Sch1-p1	Priority	1
Red-throated Diver	WACA-Sch1-p1	Local priority	5
Redwing	WACA-Sch1-p1	Priority	53
Reed Bunting	NERC S41	Priority	40

Ring Ouzel	NERC S41	Priority	13
Ringed Plover		Priority	1
Sand Martin		Local priority	168
Sandwich Tern	-	Priority, local priority, NE TIN069	2
Scaup	WACA-Sch1-p1, NERC S41	Priority	2
Shelduck		Priority; local priority	1
Short-eared Owl		Priority	5
Skylark	NERC S41	Priority	86
Slavonian Grebe	WACA-Sch1-p1	Priority, local priority	11
Snipe		Priority; local priority	10
Song Thrush	NERC S41	Priority	264
Spotted Flycatcher	NERC S41	Priority	9
Starling		Priority	291
Stock Dove		Priority	11
Swift		Priority	129
Teal		Priority; local priority	18
Tree Pipit	NERC S41	Priority	16
Tufted Duck		Local priority	20
Tree Sparrow	NERC S41	Priority	1
Turtle Dove	NERC S41	Priority	1
Velvet Scoter	WACA-Sch1-p1	Priority	2
Water Pipit		Priority; local priority	1
Whimbrel	WACA-Sch1-p1	Priority, local priority	4
Whinchat		Priority; local priority	4
Whooper Swan	WACA-Sch1-p1	Priority, NE TIN069	1
Willow Tit	NERC S41	Priority, local priority	3
Willow Warbler		Priority	123
Wood Warbler	NERC S41	Priority, local priority	1
Woodcock		Priority	12
Wood Lark	WACA-Sch1-p1, NERC S41	Priority, local priority	1
Wood Pigeon		Priority	488
Wren		Priority	456
Wryneck	WACA-Sch1-p1	Priority	4
Yellowhammer	NERC S41	Priority	48
Yellow-legged Gull		Priority	1
Yellow Wagtail	NERC S41	Priority	5

Statutory Nature Conservation Sites (SNCS)

Where they will be considered further, the relationship between of the following Statutory Nature Conservation Sites and the assessment site are shown in Map 1.

A number of Sites of Special Scientific Interest (SSSI) are located within 5km of the Site.

- St Mewan Beacon SSSI is located approximately 0.6km to the south.
- Wheal Martyn SSSI is located approximately 2.3km to the north-east

- Tregargus Quarries SSSI is 3.4km to the west
- Trelavour Downs SSSI is 4.2km to the north west
- Carn Grey Roack and Quarry SSSI is 4.9km to the east

The above SSSIs can be scoped out from further consideration based on separation distance and that they have been designated for geological features.

- St Austell Clay Pits SSSI is located 3.3km to the east and east and was selected for the bryophyte Western Rustwort *Marsuplella profunda*.

Due to separation distance, this SSSI can be scoped out from further consideration at this stage.

- Mid Cornwall Moors SSSI is located 4.8km to the north and north-west and was selected for its habitats, notable plants, invertebrates and willow tit. Due to the species and habitats this SSSI has been selected, for along with its separation distance, adverse effect is unlikely and this SSSI is also scoped out from further consideration at this stage.

Receptor value: These SSSIs are of National value but do not need to be considered further.

Falmouth Bay to St Austell Special Protection Area (SPA) if located 5.9km to the south west and was selected for black-throated diver (*Gavia arctica*), great northern diver (*Gavia immer*) and slavonian grebe (*Podiceps auritus*).

Receptor assessment: Falmouth Bay to St Austell SPA is of European importance.

St Austell Clay Pits Special Area of Conservation SAC is located 3.3km to the east and was selected for the bryophyte Western Rustwort *Marsuplella profunda*.

Receptor assessment: St Austell Clay Pits SAC is of European importance. Due to separation distance, this SAC can be scoped out from further consideration at this stage.

Breney Common and Goss and Tregoss Moors SAC is located 4.8km to the north and north west of the assessment site.

<u>Annex I habitats that are a primary reason for selection of this site:</u>

Northern Atlantic wet heaths with Erica tetralix

This lowland site exhibits mosaics of various habitats, including 4030 European dry heaths, wet heaths, acid grassland, bog, swamp, fen and open water communities. The soil-structure of these sites reflects past mining operations, which caused poor drainage. The resulting extensive wet communities include the localised M14 Schoenus nigricans – *Narthecium ossifragum* mire, closely associated with M25 Molinia caerulea – Potentilla erecta mire. There are several species of bog-mosses Sphagnum spp., bog asphodel *Narthecium ossifragum*, orchids and some nationally scarce plants, such as yellow centaury *Cicendia filiformis*, marsh clubmoss *Lycopodiella inundata* and pillwort *Pilularia globulifera*. The habitat supports rich

assemblages of butterflies (including the Annex II species 1065 marsh fritillary *Euphydryas aurinia*), moths, dragonflies and damselflies, and also a population of European nightjar *Caprimulgus europaeus*.

European dry heaths

Northern Atlantic wet heaths with Erica tetralix, and to a smaller extent, dry heath occur in this site. The dry heath is an example of H4 *Ulex gallii – Agrostis curtisii* heath, with a limited south-western distribution in Britain.

Transition mires and quaking bogs

Although possibly the site of a former raised bog, this site lying either side of the A30 trunk road and encompassing the River Fowey is now recovering from an intensive period of china clay and gravel extraction. H7140 Transition mire has developed in the hollows between ridges and mounds on which dry heathland forms a mosaic with acid grassland. Wet heath merges into Sphagnum-dominated fen vegetation with common cottongrass *Eriophorum angustifolium*, round-leaved sundew *Drosera rotundifolia*, bog-myrtle *Myrica gale*, bog asphodel *Narthecium ossifragum*, black bog-rush *Schoenus nigricans* and bog pimpernel *Anagallis tenella*. Of particular note are the nationally scarce plants yellow centaury *Cicendia filiformis*, marsh clubmoss *Lycopodiella inundata* and pillwort *Pilularia globulifera*.

Emergent vegetation around the 15 ponds includes water horsetail Equisetum fluviatile, bogbean *Menyanthes trifoliata* and marsh cinquefoil *Potentilla palustris*. Many of the transitions include tall fen vegetation with bulrush *Typha latifolia*, common reed *Phragmites australis* and bottle sedge *Carex rostrata*. Other wetland plants found in the pond margins and across the more shallow ponds include marsh St John's-wort *Hypericum elodes*, sharp-flowered rush *Juncus acutiflorus* and ivy-leaved bellflower *Wahlenbergia hederacea*. Of particular note are the nationally scarce Cornish moneywort *Sibthorpia europaea* and wavy St John's-wort *Hypericum undulatum*. Extensive willow carr has developed over much of the central part of the Goss Moor.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

Not Applicable

Annex II species that are a primary reason for selection of this site:

Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*

This is a cluster of three marsh fritillary *Euphydryas aurinia* sub-populations over a complex of wet heathland sites. This supports the largest metapopulation in Cornwall and probably the most westerly viable population in England.

Annex II species present as a qualifying feature, but not a primary reason for site selection:

Not Applicable

Receptor assessment: Breney Common and Goss and Tregoss Moors SAC is of European importance. Taking into account separation distance, this site is scoped out at this stage due to the limited transboundary effects the proposed development would have on its interest features.

River Camel Special Area of Conservation (SAC) is located 8km to the north of the assessment site.

Annex I habitats that are a primary reason for selection of this site;

Not Applicable

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

European dry heaths
Old sessile oak woods with Ilex and Blechnum in the British Isles
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

Annex II species that are a primary reason for selection of this site;

Bullhead *Cottus gobio*

The Camel represents bullhead *Cottus gobio* in the extreme south-west of its range in England. The river encompasses a range of ecological conditions with both upland and lowland characteristics. The clean, fast-flowing, relatively oligotrophic waters with their stony bottoms are particularly suitable for bullhead, which forms an important part of the total fish biomass.

Otter *Lutra lutra*

The Camel represents otter *Lutra lutra* in its main stronghold in England in the south-west of the country. Surveys have indicated a dense population along this river. Records show that these populations persisted even during the period when the otter was in serious decline over much of the rest of its range in England, and this area has acted as a nucleus for recolonisation of other parts of England. The river and its tributaries represent the more upland as well as lowland habitat types utilised by otters, satisfying requirements for adequate food supply throughout the year. The wooded lower reaches of the river provide excellent habitat for resting and breeding.

Annex II species present as a qualifying feature, but not a primary reason for site selection;

Atlantic salmon *Salmo salar*

Receptor assessment: River Camel SAC is of European importance**.**

Non-statutory Nature Conservation Sites (NNCS)

There are two County Wildlife Sites (CWS) within 2km.

Longstone Downs County Wildlife Site (CWS) is located approximately 700m to the north east (at the closest point), while the haul road serving the Site passes through this CWS. It is designated as an area containing notable habitats such as Lowland Heathland.

Burngullow Common & Glover Valley CWS is located within and immediately adjacent to the Site which represents an extensive area of semi-natural habitats including Lowland Heathland.

Lanjeth Heath CWS is located 1.8km to the south-west of the Site and is designated for priority habitats such as lowland heathland.

Receptor value: These CWS are of County value.

SSSI Impact Risk Zones

The site is not within a SSSI risk zone for wind turbines.

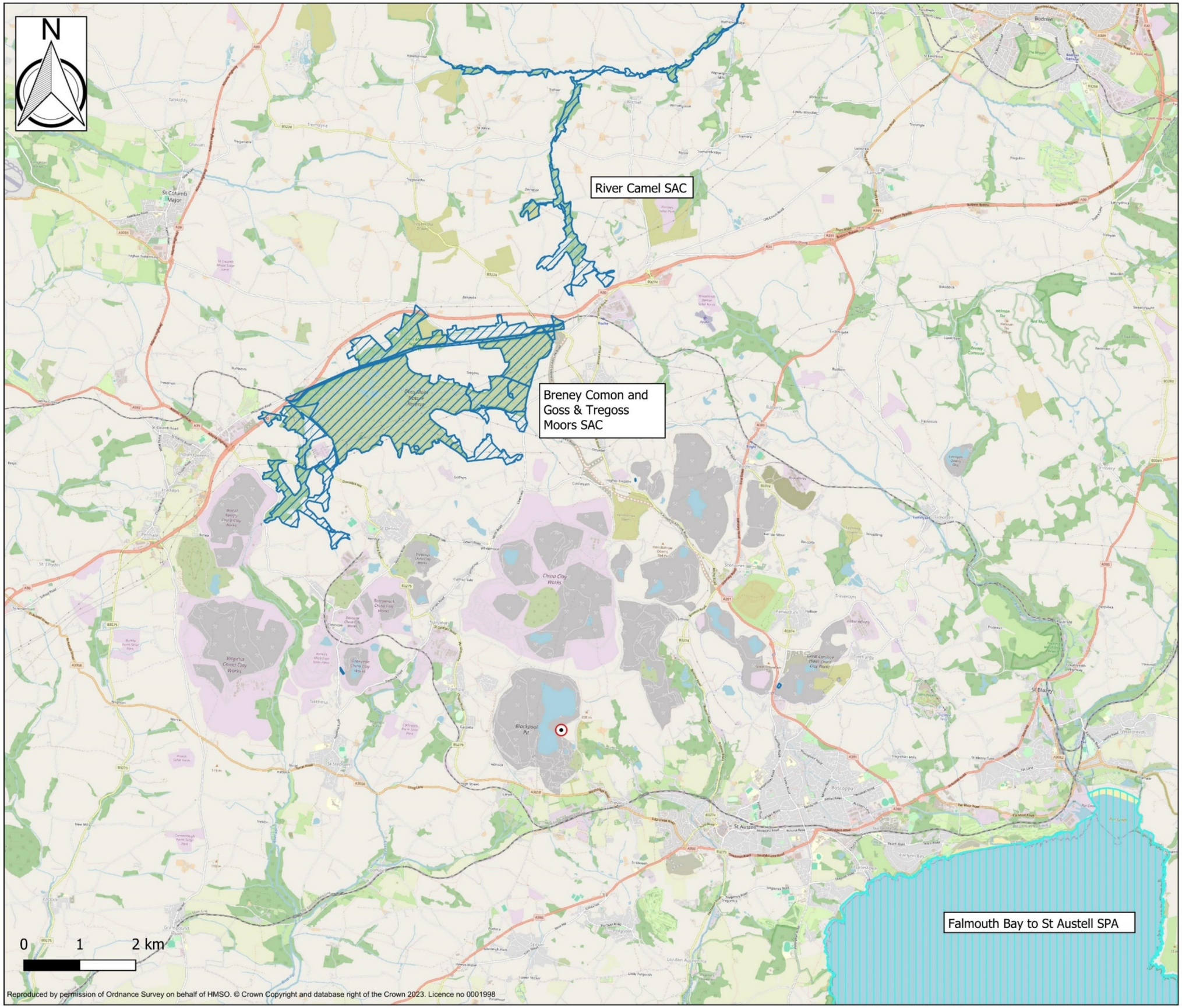
5.2. The need for an appropriate assessment

An appropriate assessment is required by Regulation 48 of the Habitats Regulations 1994 implementing Article 6(3) of the Habitats Directive (92/43/EEC) in the event that it is considered a plan or project, not connected with the management of that site, is likely to have a 'significant effect' on any European (Natura) site, i.e. Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites.

The purpose of appropriate assessment is to ensure that protection of the integrity of European sites is a part of the planning process at a regional and local level. Permission can only be granted if it can be ascertained that the plan or project will not affect the integrity of the European site.

It is appropriate to use the information assembled for this EcIA when carrying out the appropriate assessment under the Habitats Regulations.

The site is not within a SSSI impact zone for a designated site that underpins a Natura 2000 designation. An appropriate assessment is not required.



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Legend
- Proposed turbine location
- SPA's within 10km
- SAC's within 10km

Title: Map 1. Statuotry nature conservation sites for further consideration

Project: Burngullow turbine

Checked by: CDH Version: 01
Date: 08/12/2023

5.3. Baseline habitats

Habitats within the development are detailed in Map 2 and described below in Table 5, along with an assessment of their biodiversity value.

The Site concerns an area at the eastern edge of the former Blackpool Quarry, as well as existing haul road which provides access from the north. Habitats are characteristic of china clay extraction sites in the local area; mostly comprising regenerative heathland and scrub which form a mosaic with bare ground and grassland communities. An expanse of semi-natural heathland is located in the eastern part of the Site.

Table 5: Habitat description and biodiversity value.

Habitat type	Description	Biodiversity value
Urban: unsealed ground	The haul road associated with the Site comprises an unvegetated bare substrate.	Negligible
Sparsely vegetated ground; ruderal/ephemeral	Sparse vegetative communities are establishing on disused mining areas. Vegetation cover is patchy and comprised of low growing grasses, herbs and saplings including sheep's fescue, creeping bent, birds-foot, common heather, grey willow and toad rush.	Site
Other acid grassland	An acid grassland community is present over the southern embankment to the haul road and contains a mixture of grasses and herbs. Species include common & creeping bent, purple moor-grass, false oat-grass, cock's-foot, sweet vernal-grass, yorkshire fog, soft rush, foxglove, common sorrel and spear thistle. Bramble and self-seeded shrubs of grey willow are establishing in places. This habitat is unlikely to meet required thresholds to qualify as a BAP Priority habitat[12]	Site
Lowland dry heathland	Regenerative heathland has established over haul road verges and spoil heaps, and is of relatively recent origin. It is comprised of mostly common heather and western gorse with other shrubs including broom and grey willow saplings. Young rhododendron (*R. ponitcum)* bushes are also frequent. Where present, the understorey comprises grasses such as creeping soft grass, common bent, Yorkshire fog, cock's-foot, sweet vernal grass and herbs such as bramble, heath speedwell, tormentil, lousewort and greater bird's-foot trefoil. A separate area of semi-natural lowland heathland occupies the eastern part of the Site and forms part of Burngullow Common. Shrub species include common heather, bell heather and occasional cross-leaved heather. Heather age classes are mostly limited to mature and degenerate. Purple moor-grass is frequent across the habitat, providing a dense cover. Other species are generally limited to shorter sward areas and include bristle bent, green-ribbed sedge and sphagnum sp. Occasional grey willow and rhododendron shrubs are scattered across this area.	Local Habitat of Principal Importance (JNCC & Defra, 2012) & Local Biodiversity Action Plan priority habitat (Cornwall Biodiversity Initiative, 2011)
Scrub: gorse	Areas of dense scrub are present across spoil heaps. Rhododendron (*r. ponitcum)* and gorse species are abundant	Site

[12] As detailed in Natural England Technical Information Note (TIN) 110 – Assessing whether created or restored grassland is a BAP Priority Habitat

	with others including, grey willow, bramble, bracken, foxglove and purple moor-grass. This habitat forms a very dense canopy.	
Scrub: mixed	A linear band of woody scrub is present along the northern edge of Burngullow Common, comprising young to mature shrubs of grey willow, rhododendron and western gorse. Other species include bramble, bracken, hart's-tongue fern and foxglove and purple moor-grass.	Site
Scrub: mixed	A linear corridor of mixed scrub is present either side of the gateway to the quarry entrance. Woody species include grey willow, rhododendron, western gorse and buddleia. An understorey comprised bracken, bramble, common heather, purple moor-grass and mosses.	Site

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Legend

- Survey area (Approximate)
- Hardstanding
- Unsealed ground
- Ruderal/ephemeral
- SI Other acid grassland
- Scrub: mixed
- Scrub: gorse
- Lowland heathland

Title: Map 2. Baseline habitats

Project: Land at Burngullow, Cornwall

Checked by: CDH Version: 01
Date: 08 December 2023

5.4. Species of nature conservation importance

Amphibians

There are no records for amphibians within the local area. There are no aquatic habitats associated with the Site likely to support breeding amphibians. Amphibians are unlikely to regularly active within the Site.

Receptor value: The assessment site is of negligible value for amphibians.

Badger

The local area is likely to support badger populations. No evidence of badgers or badger setts recorded within the Site. The southern section which connects to Burngullow Common may provide foraging/dispersal opportunities. Badgers may occasionally be active within the southern section of the Site.

Receptor value: The assessment site is of negligible value for Badger.

Bats

There is no potential roosting habitat associated with the Site.

The Site comprises a variety of habitats characteristic of china clay extraction sites in the local area.

Post-mining areas associated with the Site are likely to provide sub-optimal habitat due to lack of supported invertebrate prey, however scrub and heathland along the southern margin is likely to provide some foraging and commuting opportunities. The site also features connectivity to unlit semi-natural habitats to the south and east such as scrub and woodland. There is potential for a variety of bat species (including light-averse species) to be active within and around the Site.

Bat activity transects

Three species and three species groups were recorded during 6hrs of bat activity transects on 3 separate survey nights. The most commonly encountered bat was common pipistrelle. The survey results are summarised below:

Summer 2021

Weather conditions were suitable for bat activity during this survey.

Common Pipistrelle

During the transect, 31 Common Pipistrelle passes were recorded associated with bats flying close to the margins of the pit to the west, and generally dispersed along the transect route.

Barbastelle

A single Barbastelle pass was recorded to the west of the proposed turbine location.

No other bats were encountered during the transect surveys.

Autumn 2021

Common Pipistrelle

During the transect, 7 Common Pipistrelle passes were recorded in the south of the site.

Myotis

A single Myotis pass was recorded in the south of the site.

No other bats were encountered during the transect surveys.

Spring 2022

Common Pipistrelle

During the transect, a single Common Pipistrelle pass was recorded in the south of the site.

Remote monitoring

All remote detectors functioned correctly for the 10-day periods of monitoring and night-time temperature during the monitoring period were typical for the seasons in which they were recorded.

Common Pipistrelle were the most commonly recorded bat during all surveys, although activity levels are below what would be expected in lowland areas of similar habitat structure and diversity with remote monitoring suggesting approximately half as much activity at the proposed turbine site when compared to nearby linear features.

This unequal partition of activity levels between the two remote monitoring sites is more pronounced for Noctule, where the number of calls drops from 111 at the nearby linear feature to 9 at the proposed turbine site.

Other records of note are Nathusius Pipistrelle, with the majority of activity associated with nearby linear features. It is also noted that Brown Long-eared calls were greater at the proposed turbine site than at nearby linear features, and this is likely to relate to prey density in the heathland habitat.

Other species, Myotis, Soprano Pipistrelle, Barbastelle, Greater Horseshoe and Lesser Horseshoe, were rarely recorded.

Data is presented in Table 6 and Charts 1 & 2.

Table 6. Bat data collected at the two monitoring locations

	Survey period	Barbastelle	Myotis	Noctule	Nathusius Pipistrelle	Common Pipistrelle	Soprano Pipistrelle	Brown Long-eared	Greater Horseshoe	Lesser Horseshoe
Linear feature	Summer 2021	-	1	16	-	82	1	3	-	2
	Autumn 2021	-	12	1	-	94	1	1	-	-
	Spring 2022	2	22	94	6	275	1	-	2	3
	Total	**2**	**35**	**111**	**6**	**451**	**3**	**4**	**2**	**5**
Turbine location	Summer 2021	1	5	6	-	47	1	2	-	-
	Autumn 2021	-	0	-	-	13	-	1	-	1
	Spring 2022	2	0	3	1	181	-	10	-	1
	Total	**3**	**5**	**9**	**1**	**241**	**1**	**13**	**0**	**2**

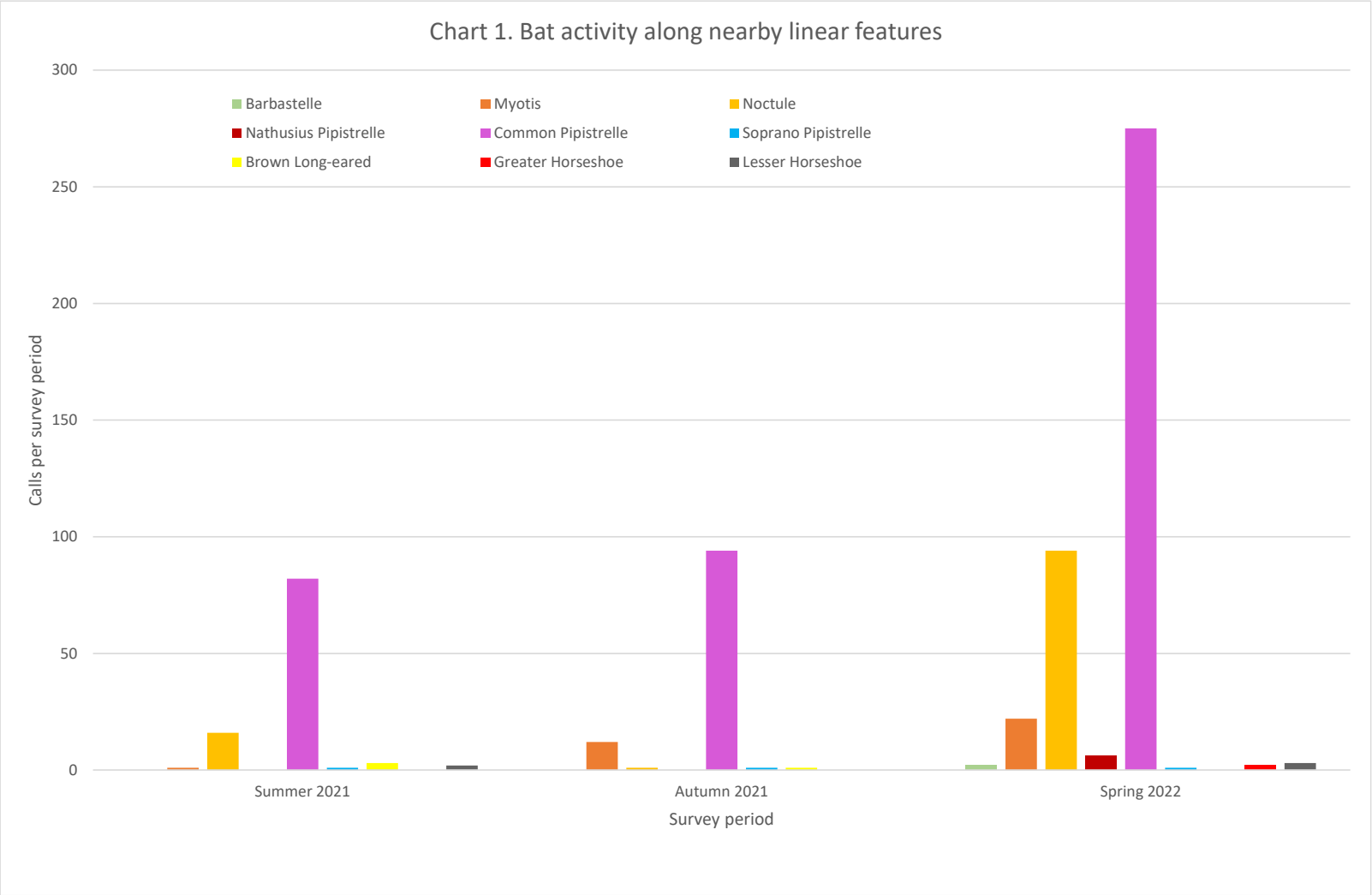
Chart 1. Bat activity along nearby linear features
300
250
200
150
100
50
0
Calls per survey period
Barbastelle
Myotis
Noctule
Nathusius Pipistrelle
Common Pipistrelle
Soprano Pipistrelle
Brown Long-eared
Greater Horseshoe
Lesser Horseshoe
Summer 2021
Autumn 2021
Spring 2022
Survey period

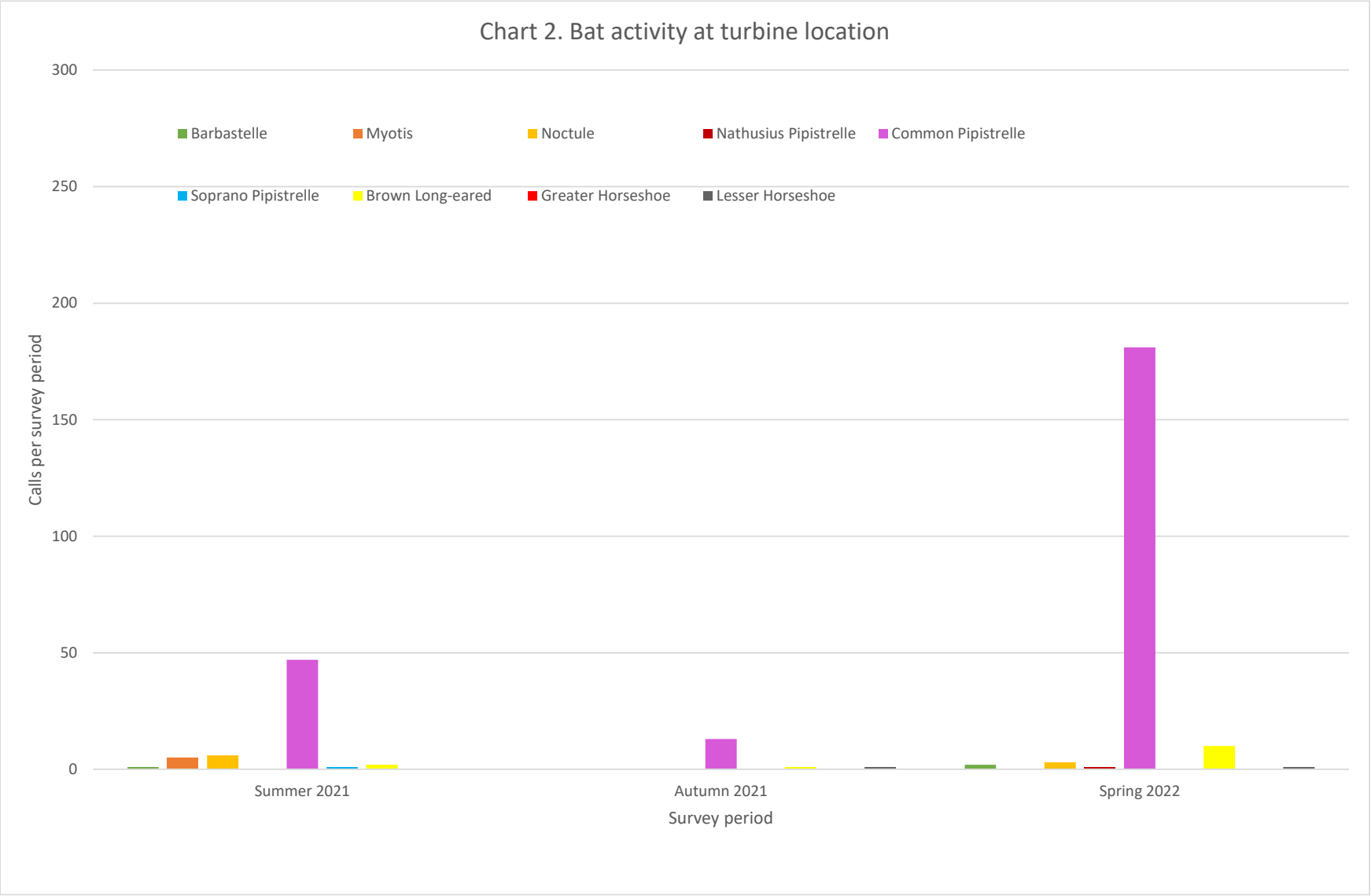
Chart 2. Bat activity at turbine location
300
250
200
150
100
50
0
Calls per survey period
Barbastelle
Myotis
Noctule
Nathusius Pipistrelle
Common Pipistrelle
Soprano Pipistrelle
Brown Long-eared
Greater Horseshoe
Lesser Horseshoe
Summer 2021
Autumn 2021
Spring 2022
Survey period

Value of the assessment site has been assessed in line with Reason, P.F., and Wray, S., 2023[13] for all species present here (Table 8) taking into account:

- Levels of recorded bat activity
- Landscape including habitat type, connectivity, elevation.
- Proximity/connectivity to known roost, or suitable roosting habitats
- Species habitat preferences

Table 8. Value of the assessment site for foraging and commuting bat species

Species	Level of record bat activity	Species habitat preferences[14]	Landscape value	Proximity/connectivity to known roost, or suitable roosting habitats	Receptor evaluation
Barbastelle	Negligible	Wooded river valleys and occasionally meadows	Low	No known roosts within 5km and assessment site has moderate Connectivity - Low	Negligible
Myotis	Low	Woodland, lakes, grassland and rivers.	Moderate	No known roosts within 5km and assessment site has moderate Connectivity - Low	Site
Noctule	Low	Open habitats and rivers or lakes. More often found in lowland areas and those with old forests, rivers and marshland	Moderate	Nearest known roost in 3km away for 3 bats. Assessment site has moderate Connectivity - Moderate	Site
Nathusius pipistrelle	Negligible	Woodland areas, both deciduous and coniferous, rides and paths. On the edges of lakes near deciduous woodland and old buildings	Low	No known roosts within 5km and assessment site has moderate Connectivity - Low	Negligible
Common Pipistrelle	Moderate	Farmland, open woodland, gardens, lakes and large hedgerows. Tends to avoid very open habitat such as moorland and grassland where linear features are comparatively rare	Moderate	Nearest known roost in 0.6km away for a single bat, and assessment site has moderate Connectivity - good	Site
Soprano Pipistrelle	Low	Prefers riparian habitats. Tends to avoid open habitat such as farmland,	Moderate	Nearest known roost in 4.5km away, and assessment site has poor Connectivity - Low	Negligible

[13] Reason, P.F. and Wray, S. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats.* Chartered Institute of Ecology and Environmental Management, Ampfield.
[14] https://www.bio.bris.ac.uk/research/bats/britishbats/

		moorland and grassland.			
Long-eared	Low	Open woodland including both deciduous and coniferous habitats. Sheltered valleys, parks and gardens.	Moderate	Nearest known roost in 2.4km away comprising a breeding group and assessment site has poor Connectivity - Moderate	Site
Greater Horseshoe	Negligible	Usually in areas with mixed deciduous woodland and grazing pastures on steep south-facing slopes.	Moderate	No known roosts within 5km and assessment site has moderate Connectivity - Low	Negligible
Lesser Horseshoe	Negligible	Sheltered valleys, woodland edge, pasture and wetlands.	Moderate	Nearest known roost in 0.6km away for small numbers of bats with a breeding roost within 2.5km. Assessment site has moderate Connectivity - good	Site

Breeding birds

Vantage pint surveys

Summer Vantage Point surveys were completed from a location approximately 500m to the north-east of the proposed turbine location and which overlooks the survey area. This allowed robust coverage of birds transiting though the airspace of the proposed turbine site from all directions.

The number of flights for birds at risk height within the view shed is given in Table 9 & 10 below.

Table 9. Bird flight data from VP survey (non-directional modelling)

Species	Number of bird transits through rotors per season (March-August)	Average collision risk[15](%)	Estimated number of collisions per season without avoidance behaviour[16]	Estimated number of collisions per summer season with 99.5% avoidance for large gulls (Cook et al, 2014)
Buzzard	73.35	6.4	3.99	0.08
Herring Gull	208.01	7.1	12.56	0.06
Great Black-backed Gull	16.56	7.3	1.03	0.005
Kestrel	28.94	5.7	1.40	0.03
Lesser Black-backed Gull	18.61	6.8	1.08	0.005
Sparrowhawk	2.06	5.6	0.10	0.002

[15] average collision risk derived from the SNH probability spreadsheet

[16] Based on operational period of 85%

Table 10. Bird flight data from VP survey (directional modelling)

Species	Number of birds passing through rotors per season (March - August)	Average collision risk (%)	Estimated number of collisions per summer season without avoidance behaviour	Estimated number of collisions per summer season with 98% avoidance (SNH, 2018) unless otherwise stated
Mallard	11.53	6.3	0.62	0.01

Receptor value: The assessment site is of Site value for breeding birds recorded during vantage point surveys.

Breeding bird survey

The results indicate that the Site supports a breeding bird assemblage that is characteristic of the local area, although numbers of individuals birds are relatively low. Bird activity was generally associated with the mixed and gorse scrub along the northern boundary, associated with the access track. 3 species were regularly associated with the open heathland area; Cuckoo, Grasshopper Warbler and Meadow Pipit.

A total of 8 species of birds were recorded during the 3 breeding bird transects in April, May and June 2022. Of the 8 species recorded, 6 species are declining and included in the RSPB BoCC Red or Amber lists, whilst 3 are also species of principal importance. The remainder were common and widespread passerines.

Of the 6 species recorded that are of conservation concern, 2 are probably breeding, while the other 4 species exhibited behaviour suggesting that they were possibly breeding within and around the Site. The records for probable breeders (Bullfinch and Willow Warbler) are suggestive of territories in the area.

Table 11. Species of principal importance and BoCC Amber and Red listed species

Species	BoCC status	Species of principal importance?	Maximum number per survey/frequency during the three transects	Breeding status
Cuckoo	Red	Yes	2/2	Probable breeder
Grasshopper Warbler	Red	Yes	2/1	Possible breeder
Linnet	Red	Yes	1/3	Probable breeder
Meadow Pipit	Amber	No	2/3	Probable breeder
Willow Warbler	Amber	No	2/1	Possible breeder
Wren	Amber	No	1/3	Probable breeder

Receptor value: The assessment site is of Local value for breeding birds recorded during breeding bird survey.

Nightjar survey

No Nightjars were observed or heard churring from the Site or the surrounding habitats during the completed survey effort.

As such, it is reasonable to conclude that Nightjar are absent from the area and are not breeding within the Site or the immediate surroundings.

Receptor value: The assessment site is of negligible value for nightjar.

Common Dormice

There are no records for Dormice within 1km of the Site. The Site lacks continuous scrub/wooded habitat and lacks connectivity to suitable habitat in the local area. There are no known populations in the local area and Dormice very unlikely to be present.

Receptor value: The assessment site is of Negligible value for dormice.

Reptiles

This mosaic of habitats, with varying vegetation density and heights, provide good potential for foraging and resting common reptiles, in particular Slow Worm and Common Lizard, to be present within the Site.

During the seven surveys, Slow Worm, Common Lizard and likely Adder were recorded. Full survey results are detailed in Table 12 below.

Table 12. Reptile survey results at Burngullow

Survey no.	Date	Time	Weather	Results	Comments
1	15/04/2022	10:30	10^0C, 60% cloud, dry, scattered cloud, wind = 2-3w	No reptiles	
2	22/04/2022	09:30	11^0C, 30% cloud, sunny, dry & mild, wind = 1-2ne	1x Common Lizard (female)	Recorded in main heathland area
3	29/04/2022	10:00	12^0C, 40% cloud, warm, hazy & still, wind = 0	1 x Common lizard	Dead individual. Sex undetermined.
4	05/05/2022	20:00	12^0C, 60% cloud, mild, dry and breezey, wind = 2-3w	No reptiles	
5	23/05/2022	08:15	12^0C, 80% cloud, mild, overcast, dry, wind = 1-2w	No reptiles. Piece of shedded snakeskin found under matt	Likely Adder
6	09/06/2022	08:15	14°C, 70% cloud, dry, sunny spells, calm, wind = 0	4 x Slow Worm (2x male & 2x female)	1 slow worm (f) located in main heathland area, remaining 3 (2m & 1f, on bunded area)
7	04/07/2022	09:30	14°C, 80% cloud, mild, dry, overcast, wind = 2-3sw	1 x Common Lizard (juv) 2 x Slow Worm (female	Common lizard in main heathland area, Slow Worm in bunded area.

The reptile community at this site has been assessed against criteria produced by Froglife, the UK herpetofauna conservation organisation, to determine its importance (Froglife, 1999).

Three species were recorded at this Site which qualifies it as a Key Reptile Site.

Receptor value: The assessment site is of Local value for reptiles.

Otter

There is no potential for Otter to be present within the Site.

Receptor value: The assessment site is of Negligible value for Otter.

Water Vole

There is no potential for Water Vole to be present within the Site.
Receptor value: The assessment site is of Negligible value for Water Vole.

Invertebrates

Habitats within the Site are likely to support common and widespread invertebrates, although priority invertebrate habitats such as flushes, ponds, brown-field land and soft rock cliffs are absent from the site.

Receptor value: The assessment site is of Negligible value for notable invertebrates.

Plants

There are eight records of the nationally rare liverwort Western Rustwort within 1km of the Site, however these do not relate to the Site or its immediate surroundings, while there is no suitable habitat contained within the Site. Other habitats will support typical plant communities with limited potential for rare or notable species.

Receptor value: The assessment site is of Negligible value for notable plants.

Invasive non-native species

Rhododendron (*R. ponticum*), which is listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), as Invasive Non-native with respect to England and Wales, is dominant to frequent across areas of scrub and heathland within the Site.

Receptor value: invasive non-native plants are present.

The ecological receptors to be considered for significant effects are given in Table 11. These are of local or higher value; those ecological receptors that have less than local value are not considered further unless they are European Protected Species and there is potential for them to be present (in which case the regulatory context i.e. the Habitats Regulations 2010 is considered), or they are the subject of national legislation (i.e. Wildlife and Countryside Act 1981).

Table 11. Table of ecological receptors to be considered for significant effects

Receptor	Relevant legislation/policy	Value
Falmouth Bay to St Austell SPA	EC Directive 2009/147/EC on the Conservation of Wild Birds Special Protection Area	European
River Camel SAC	Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales	European
Breney Common and Goss and Tregoss Moors SAC	Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales	European

Longstone Downs CWS	Local plan	County
Burngullow Common & Glover Valley CWS	Local plan	County
Lowland dry heath	Priority BAP habitat, Habitat of Principal Importance	Local
Bat assemblage – foraging and commuting	European Protected Species, Species of Principal Importance	Varied
Breeding birds	Wildlife and Countryside Act 1981, Priority BAP species	Local
Reptiles	Wildlife and Countryside Act 1981, Priority BAP species	Local
Invasive non-native species	Wildlife and Countryside Act 1981	Present

6. Assessment of ecological impacts

6.1. The development

A single wind turbine, up to 135m in height with a 77m hub height and 58m blade radius, with associated infrastructure and access track is proposed.

6.2. Construction phase impacts

During the construction phase, there is predictable adverse effects which are generally unavoidable; many are short term and can be minimised as part of the construction management, but some have the potential for more lasting effect.

The potential for adverse effects are largely short term impacts associated with noise and vibration, airborne and waterborne, pollutants, short term habitat loss or disturbance. The potential for adverse impacts would be minimised as far as possible through the application of good practice techniques and adherence to well-designed method statements; these would be managed through a Construction Environmental Management Plan (CEMP).

Statutory nature conservation sites

River Camel SAC

The assessment site is not within the catchment of the River Camel, whilst the species it has been selected for would not rely on habitats within it. No realistic ecological pathway of effect exists.

Assessment: It is certain that unmitigated construction would have a negligible impact on River Camel SAC.

Falmouth Bay to St Austell SPA

This SPA has been selected for black-throated diver, great northern diver and slavonian grebe. These aquatic birds would not rely on habitats within the assessment site and no realistic ecological pathway of effect exists.

Assessment: It is certain that unmitigated construction would have a negligible impact on Falmouth Bay to St Austell SPA.

Non-statutory nature conservation sites

Longstone Downs CWS

This CSW is of County value and is located approximately 700m to the north of the proposed turbine access track.

There is potential for accidental damage, and waterborne pollution from the assessment site that sits above this CWS. In addition, there is potential for airborne pollutants, such as dust, to be created during the construction phase and this may be transported by air movement towards this CWS, although dust deposition is common in areas close to modern farming operations.

Assessment: It is probable that unmitigated construction would have a temporary, Slight adverse effect on this non-statutory nature conservation site.

Burngullow Common & Glover Valley CWS

The site of the proposed turbine location is located within this CWS, which has been designated for the Priority habitat lowland heathland.

A total of 0.1ha of this CWS will be temporarily lost to the construction phase to provide storage areas/compounds, while there is also potential for accidental damage of retained heathland habitat, located adjacent to construction areas. Additionally there is potential for water & air borne pollution to be created during the construction phase and this may be transported towards and deposited within towards this CWS. Temporary loss and disturbance of this small extent of habitat will have a Negligible effect on the wider CWS to support populations notable species. Mitigation for this will involve implementation of precautionary measures and protection of retained habitat, which will be outlined in a CEMP.

Assessment: The construction phase will have a probable no adverse effect on this CWS.

Habitats

Lowland heathland

Lowland heathland that is present within this Site is of Local value.

A total of 0.1ha will be temporarily lost during the construction phase. There is also potential for adverse effects during the construction phase associated with accidental damage. When viewed in context of the local area, the temporary loss of such a limited extent of this habitat type will have a negligible impact on notable species which depend on its availability. Mitigation for this will involve implementation of precautionary measures and protection of retained habitat, which will be outlined in a CEMP.

Assessment: The construction phase will have a probable no adverse effect on this habitat type in Cornwall.

Species

Bats – foraging and commuting

The assessment site is of Negligible value for Barbastelle, Nathusius's Pipistrelle, Soprano Pipistrelle and Greater Horseshoe, Site value for Myotis, Brown Long-eared, Greater Horseshoe and Noctule, and Local value for Common Pipistrelle.

The primary pathway of effect during the construction phase would be through impacts to habitat features used by foraging bats, such as direct habitat loss and damage. There will be a temporary loss of 0.1ha of heathland habitat associated with construction due to storage areas/compounds. This habitat is widespread in the local area and loss of this limited extent in context to the wider area is unlikely to impact local populations.

No night-time works are planned during the construction phase. Short term disturbance to these habitats is unlikely to affect local bat populations.

Assessment: Unmitigated construction is near certain to have a negligible effect on foraging and commuting bats. .

Breeding birds

The construction phase is proposed to extend over a 25 week/6 month period and will involve the construction of new access tracks and temporary compounds, blade lay down and crane pad areas, installation of the new turbine and associated cabling, followed by reinstatement of these temporary construction areas.

The assessment site is of Local value to breeding birds, with most bird activity associated with the woody scrub and gorse scrub along the access track verge at the northern and western margins, as well as across the open heathland associated with Burngullow Common. There is potential for construction activities to result in habitat loss for breeding birds at this site, if undertaken during the accepted breeding period. Construction activities will predominantly impact scrub and heathland habitats, which has potential to damage or destroy active birds' nests or cause nest abandonment/failure. Any impacts associated with the construction phase would be short-term and temporary given the reinstatement of much of these areas and the abundance of these habitats in the local area.

Assessment: It is probable that unmitigated construction would have a temporary, Slight adverse effect on breeding birds.

There is potential to impact breeding birds in a way that could be considered an offence under relevant wildlife legislation.

Reptiles

The assessment site is Local value for reptiles species. The primary pathway of effect would be vegetation clearance of grassland, scrub and heathland habitats, and accidental damage of retained habitat. There is good potential for reptiles to relocate as the construction site will move forwards slowly. The temporary loss of habitat associated with construction works would not affect foraging reptiles, or reptile populations, due to the connectivity off-site habitats and suitability of this off-site habitat.

Assessment: It is probable that unmitigated construction would have an adverse effect on individual reptiles were they to be present. Any affect were it to occur would be Slight adverse, and short term.

Intentional killing for injuring of reptiles would be considered an offence under relevant wildlife legislation.

Invasive non-native species

Rhododendron is frequent within the scrub, grassland and heathland habitats. There is potential for the spread of this plant across the construction areas and into off-site areas.

Assessment: It is probable that unmitigated construction would have an adverse effect on retained habitats. Any effect were it to occur would be Slight adverse and medium term.

Spread of Rhododendron in the wild would be considered an offence under relevant wildlife legislation.

6.3. Operational phase impacts

Overview

During the operational phase, there are predictable adverse effects including the permanent loss of habitat under the development, disturbance during maintenance, and barrier effects and displacement of birds.

There is also the potential for effects on bird and bat populations due to collision with the moving blades of the turbines.

Statutory nature conservation sites

River Camel SAC

The assessment site is not within the catchment of the River Camel, whilst the species it has been selected for would not rely on habitats within it. No realistic ecological pathway of effect exists.

Assessment: It is certain that unmitigated operation would have a negligible impact on River Camel SAC.

Falmouth Bay to St Austell SPA

This SPA has been selected for black-throated diver, great northern diver and slavonian grebe. These aquatic birds would not rely on habitats within the assessment site and no realistic ecological pathway of effect exists.

Assessment: It is certain that operation would have a negligible impact on Falmouth Bay to St Austell SPA.

Non-statutory nature conservation sites

Longstone Downs CWS

This CWS is of County value and is located approximately 700m to the north of the proposed turbine.

There will be no habitat loss within this CWS whilst the features for which this site has been selected are not susceptible to other operational effects associated with the proposed development.

Assessment: It is certain that unmitigated operational phase would have a negligible effect on this non-statutory nature conservations site.

Burngullow Common & Glover Valley CWS

The proposed turbine location is located within this CWS, which is designated for lowland heathland habitat and is of County value.

A total of 0.13ha of lowland heathland habitat will be permanently lost. The loss of this habitat within the CWS concerns an area located at the edge of the wider expanse of heathland habitat and is relatively minor in the context of the extent of retained habitat and wider CWS (0.13ha equals 0.12% of the wider CWS). Mitigation for this is detailed within the

accompanying BNG Plan, and includes 1.3ha of lowland heathland creation within an existing Nature Network Area[17]. Loss of this small extent of habitat will have a Negligible effect on the CWS to support populations notable species, whilst the creation of additional lowland heathland in a Nature Network Area will improve connectivity between Longstones CWS and Burngullow and Glover Valley CWS and will result in an overall positive gain for this habitat type in Cornwall.

Assessment: The operational phase would have a probable no adverse effect on this non-statutory nature conservation site.

Habitats

Lowland heathland

The lowland heathland habitat contained within this site is of Local value.

A total of approximately 0.13ha will be permanently lost. In the context of the local landscape (where this habitat is frequent) this would represent a very minor impact. Mitigation for habitat loss is detailed in the accompanying BNG Plan and involves creation of 1.3ha of lowland heathland within an existing Nature Network Area. This will result in a positive gain for this habitat type in Cornwall.

Assessment: The operational phase is near-certain to have a permanent, minor positive effect on this receptor.

Bats

No suitable features for roosting bats were within 200 metres of the Assessment Site.

The primary pathway of effect would be through permanent habitat loss associated with the development and collision with moving blades.

The proposed development will lead to the loss of a limited area of lowland heathland habitat associated with access tracks and other infrastructure. This loss of this limited extent, when viewed in context against the extent of retained habitat that will remain viable for foraging bats is unlikely to have an effect.

In the absence of Ecobat analysis, this assessment is derived from available research, recorded activity levels, published collision risks and population vulnerability[10], and professional judgement.

The assessment site is of Negligible value for Barbastelle, Nathusius's Pipistrelle, Soprano Pipistrelle and Greater Horseshoe, Site value for Myotis, Brown Long-eared, Greater Horseshoe and Noctule, and Local value for Common Pipistrelle.

[17] The nature network area corresponds to approximately 25% of the total land in mainland Cornwall. Although areas are valued on the basis of existing biodiversity and benefits, these benefits may still be enhanced by further habitat restoration and creation.

Due to their extremely low levels of activity during walked transects and remote monitoring, no realistic ecological pathway of effect exists for Barbastelle, Nathusius Pipistrelle, Soprano Pipistrelle and Greater Horseshoe.

Common pipistrelle

Individual common pipistrelle bats and their populations are considered to be at high risk from wind turbines (TIN059).

Common pipistrelle were the most commonly recorded bat at this site. Taking into account landscape, habitat and land use, and informed by personal experience, activity levels at the assessment site are considered within the normal range for Cornwall.

Activity levels of this bat has been shown to be elevated in the vicinity of operational turbines[9], although the reasons for this are not yet clear and could relate to foraging opportunities or roost seeking. As this bat is known to regularly forage along hedgelines, as, it is unlikely that the proposed turbine will result in adverse effects on this bat.

Assessment: It is probable that operational phase will have negligible effect on populations of common pipistrelle. Any effect, were it to occur, would be at an individual level due to collision mortality and would be minor adverse.

Noctule

Individual Noctule bats and their populations are considered to be at high risk from wind turbines (TIN059).

Noctule are considered a high collision risk species and high population vulnerability. This is a bat of open spaces which regularly fly's and forages at the heights swept by large wind turbines. Studies in German coastal areas found that greater than 70% of noctule avoided turbines at a local scale[18], although they admit that their sample sizes are small and close to roosts this bat tends to fly towards turbines. This is a bat with high amplitude calls (Noctule can be recorded at distances of 100 metres); if it was foraging here on a regular basis for prolonged periods, many more calls would have been recorded.

Levels of Noctule activity at the turbine site were very low equating to one pass every three nights of remote monitoring with no encounters during activity transects.

Assessment: It is probable that operational phase will have negligible effect on populations of noctule. Any effect, were it to occur, would be at an individual level due to collision mortality and would be minor adverse.

Brown Long-eared

Individual Brown Long-eared bats are considered to be at low risk from turbines and their populations at low risk (TIN059).

[18] Christine Reusch, Maja Lozar, Stephanie Kramer-Schadt, Christian C. Voigt. Coastal onshore wind turbines lead to habitat loss for bats in Northern Germany. Journal of Environmental Management 310 (2022) 114715

Brown Long-eared calls are greater at the proposed turbine site than at the nearby linear features. However, this only equates to one call every two nights. Although this bat is likely to be under recorded due to its quiet call, this bat is not considered at risk from turbines due to its foraging ecology; it flies close to vegetation.

Assessment: It is probable that operational phase will have negligible effect on populations of common pipistrelle. Any effect, were it to occur, would be at an individual level due to collision mortality and would be minor adverse.

Other bats recorded here

Low numbers of passes were recorded from Myotid, Horseshoe bats, Nathusius Pipistrelle, Soprano Pipistrelle and Barbastelle.

None of these species are active within the vicinity of the turbine on a regular basis. An operational turbine at this site would pose a negligible risk of collision to these bats and no risk to their local populations.

Assessment: It is near certain that the operational phase would have a negligible impact on individual Myotis and Brown Long-eared bats and their populations.

Breeding birds

The assessment site is of Local value for breeding birds.

Habitat loss

The proposed development will result in the permanent loss of the approximately 0.13ha of lowland heathland habitat and a smaller extent of scrub habitat (both Gorse scrub and mixed scrub). The loss these habitats will therefore result in the loss of extent of nesting habitat for these species recorded within the Site. Although many of the species recorded are species of conservation concern, they occur frequently in the local area (recorded during previous surveys for other turbines) while nesting habitat is also readily available across the wider clay workings, and so this is only considered to pose a minor negative impact on breeding bird species. Furthermore, an area of new scrub plantings is proposed to adjoin to an area of heathland creation on Longstone Downs (as part of BNG proposals), approximately 1.4km to the north-east of the Site. This will create a similar habitat mosaic to the proposed development site and so will prevent a net loss in breeding habitat for these species.

Any birds active in this area will be used to certain amount of disturbance associated with the ongoing mining operation to the south (lighting, noise, vibration), whist available nesting habitat is plentiful across the wider clay working areas. As such, the loss of a limited extent of breeding habitat to the development is not considered likely to adversely affect the conservation status of these breeding bird species, or impact local populations.

Disturbance/displacement

Indirect habitat loss through displacement and disturbance is not considered likely to impact the species breeding within the Site. Displacement distances for birds such as Meadow Pipits (Hötker et al. 2005; RSPB, 2009) have been shown to be between 41-100m from wind turbines, while other studies (Devereux *et al.* 2008; Percival, 2005) suggest wind turbines to

cause little disturbance to passerines. Areas of retained habitat across the wider Burngullow Common are therefore likely to remain viable for the species that are present.

Any birds active in this area will be used to certain amount of disturbance associated with the ongoing mining operation to the south (lighting, noise, vibration), whist available nesting habitat is plentiful across the wider clay working areas. As such, the loss of a limited extent of breeding habitat to the development is not considered likely to adversely affect the conservation status of these breeding bird species, or impact local populations.

There are already two existing wind turbines within 2km of the Site and birds that are active in this area will be normalised to movements and elevated structures within the local landscape. This behaviour has been observed during surveys for a newly proposed turbine at Goonamarth, where many flights were recorded in close proximity to the existing turbine. A study of wind farms in Scotland and North England (Pearce-Higgins et al, 2012), found there was little evidence for consistent post-construction population declines in any species, suggesting that wind farm construction can have greater impacts upon birds than wind farm operation.

Barrier effect

The proposed turbine is unlikely to disrupt any regular flight paths used by birds that are active in the area. Regular flight routes observed during the vantage point surveys were largely associated with commuting to and from the waterbody at Blackpool pit, particularly for the gull species recorded. Gull species have also been observed (during previous VP surveys) using avoidance tactics when flying in the vicinity of other existing turbines (such as Goonamarth turbine), despite this feature being located within a broad commuting corridor, suggesting that the siting of a turbine is very unlikely to act as a barrier to gull species in the local area. Buzzards exhibited similar flight patterns to gulls, showing a preference for open ground and were often soaring on thermals produced from rising air over the slopes and body of Blackpool Pit. It is likely that Buzzards use the habitats within the survey area for hunting, which were largely accessed from the north, south and west of the proposed turbine. It is therefore unlikely that the proposed turbine will prevent Buzzards from accessing hunting grounds in the area.

Kestrel flights were largely observed to be hunting over semi-natural habitats within the survey area. Kestrel flights were occasionally observed close to the existing turbine near St Mewan Beacon turbine and appeared to be undeterred by its presence. The proposed turbine is very unlikely to create a barrier effect to Kestrels within the area, as it will not block access to hunting grounds which are widely available in the surrounding landscape.

Collision risk

Collision risk modelling for target species recorded within the survey area during the summer period has been undertaken for the survey effort to date (March to August).

When considered in isolation from other turbines, for all species the modelled collision risk is less than 1 individual per summer season (March to August). The highest modelled mortality rates were for Herring Gull (0.06 collisions per summer or 1 collision per 16.67 summers), Buzzard (0.08 collisions per summer or 1 collision per 12.5 summers) and Kestrel (0.03

collisions per summer or 1 collision per 33.33 summers). This turbine would have a negligible effect on local bird populations.

Assessment: It is near-certain that the operational phase will have a negligible effect on local breeding bird populations.

Reptiles

The Site qualifies as a Key Reptile Site as three species were recorded during the survey.

Low numbers of Slow Worm (max count 4) were recorded within a mosaic of gorse scrub and grassland across a vegetated bund. Individual Common Lizard (1), Slow Worm (1) and Adder (1) were recorded within open heathland in the centre of the Site.

An area of approximately 0.30ha of combined heathland and scrub habitat will be lost to the development footprint, with 0.1ha of this being restored post construction.

The Site is located at the north-western edge of Burngullow Common which consists of a wider expanse of predominantly lowland heathland habitat with scattered scrub. The Site features direct connectivity with this wider expanse, and which provides optimal reptile habitat. The development site is assessed as a Key Reptile Site due meeting criteria regarding the number of species recorded, rather than the population sizes it supports. The Site forms part of Burngullow Common, a larger expanse of suitable habitat for the three reptiles recorded. It is therefore reasonable to assume that Burngullow Common functions as a Key Reptile Site, of which the development site is part of and contributes to, given the likely dispersal of reptiles between the Site and Burngullow Common.

Reptile population densities have been shown to be very low at this Site with a max count of 4 per 1ha (surveyed area), or 1 per 0.25ha. Assuming this density applies to the wider Burngullow Common area (based on continuous nature of habitat), the permanent loss of 0.2ha of habitat to the development would lead to the reduction in carrying capacity by approximately 1 individual Slow Worm, and likely to be lower for other species. Given the extent of optimal habitat that will remain undisturbed across the wider Burngullow Common expanse (approx. 8ha), the loss of 0.2ha to the proposed development is considered unlikely to impact the viability of the reptile populations at this site and within the wider Burngullow Common area.

A total of 0.1ha of heathland will be restored upon completion will be managed in a way that will benefit reptiles, as per the Biodiversity Net Gain requirements.

The permanent loss of 0.2ha of habitat to the development is therefore not considered likely to impact the functionality of the Burngullow Common as a Key Reptile Site during the operation of the turbine, based on the amount of available retained habitat with connectivity to the Site.

Assessment: It is near-certain that unmitigated operation would have no adverse effect on individual reptiles, were they to be present.

Invasive non-native species

The operation of the proposed turbine would be unlikely to cause the spread of Rhododendron in the wild.

Assessment: It is near-certain that the operational phase will have a negligible effect on spread of invasive non-native species.

7. Mitigation

7.1. Construction phase

The following mitigation would be provided to minimise the unavoidable effects during the construction phase:

- Design and delivery of a Construction Environment Management Plan that incorporates ecological protections for all sensitive ecological features. This will include:
    - statement of responsibilities
    - duties of the ecological clerk of works
    - ecological mitigation during the construction phase
    - rigid control of worksite boundaries
    - control of waste
    - storage of materials
    - dust management plan
    - pollution prevention plan
- Precautionary mitigation is recommended to prevent accidental damage to the retained areas of lowland heathland during the construction phase. This should involve implementation of a 2 metre protection zone (as a minimum) from the outer edge of all retained heathland habitat. During the construction phase this 2m protection zone should include:
    - A temporary fence situated along the outer edge of the protection zone, during the entire construction phase;
    - No storage of machinery, chemicals or other materials, within the protection zone;
    - No ground disturbance or burning within the protection zone;
    - No vehicles tracking within this protection zone;
    - Construction staff briefed during induction as to the purpose of these protection zones;
    - Implementation of appropriate bio-security measures and appropriate waste disposal to prevent spread of invasive non-native species across the construction site and into wider areas.
- Vehicle and machinery movements should follow only designated routes to help contain disturbance to the works areas.
- Prior to vegetation removal, the following methods will be adopted in relation to reptiles:

    <u>Construction in period late March to October</u>

    - If construction is to occur during the active reptile season (late March to October), areas to be affected by construction activities should be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist. Any grassland, scrub or heathland, will initially be strimmed to a height of no more than 20 cm, having first used an ecologist to walk and beat the habitat. This will encourage reptiles to disperse naturally into the neighbouring uncut vegetation. After at least 24 hours, a second cut will be made as close to ground/bank level as possible. This should ensure that any reptiles, if present, are displaced from the construction site onto adjacent intact habitats.

Construction during the period November to mid-March:

- Clearance of areas that may provide hibernacula (such as mammal burrows, shrub roots, scrub and tussocky grassland) should be avoided during these periods as there is unknown potential for hibernating reptiles to be present. If this is planned but unavoidable, it is recommended that vegetation is cut back to bank level during September and October and kept close-managed to deter hibernating reptiles.

- Prior to vegetation removal, the following methods will be adopted in relation to nesting birds:
  - Any activities affecting these habitats should be completed during the period September to February inclusive, outside the accepted bird nesting season.
  - If this is not practicable, within 24 to 48 hours prior to the start of works these habitats should be thoroughly inspected by a suitably qualified person prior to disturbance or removal.
  - If nesting birds are found, all activities likely to damage the immediate area should be delayed until chicks have fledged.

7.2. Operational phase

The following mitigation would be provided to minimise the unavoidable effects during the operational phase:

- Handling and storage of chemicals and oils in line with Government guidelines and manufacturers recommendations;
- Creation of 1.3ha of lowland heathland habitat within an Existing Nature Network Area (as detailed in accompanying BNG report). This is located approximately 1.5km to the north of the proposed development site, approximately 300m to the east of Longstones CWS and adjacent to heathland creation areas that have been approved in relation with East Karslake turbine. This will deliver a larger, contiguous expanse of heathland habitat that will aid connectivity between Longstones CWS and Burngullow Common & Glover Valley CWS.
- 1.1ha of mixed scrub in off-site areas within an Existing Nature Network Area (as detailed in accompanying BNG report). This is located approximately 1km to the north-east of the proposed development site, approximately 300m to the east of Longstones CWS and approximately 300m to the north of Burngullow Common & Glover Valley CWS. This habitat creation will serve to improve connectivity between Longstones CWS and Burngullow Common & Glover Valley CWS

8. Residual impacts

Residual impacts on valued ecological receptors during the construction and operational phases are minimal. Detail of potential impacts and their significance at the level of assessment are given in Table 13. Where no reasonable pathway of effect exists and pre-mitigation impact has been discounted, the receptor is not considered here.

Table 13. Summary of residual impacts following mitigation

Receptor (valuation)	Description of impact	Magnitude of potential impact	Level of effect (incl: adverse or beneficial, short term or permanent, short, medium or long term)	Mitigation	Residual impact - Significant / not significant?
Construction phase					
Longstone Downs CWS (County)	Adverse effects may arise from accidental damage, waterborne and airborne pollution	Minor	Short term, adverse	Adoption of a suitable CEMP	Negligible
Burngullow Common & Cover Valley CWS (County)	Adverse effects may arise from loss of 0.1ha of lowland heathland habitat, and accidental damage, waterborne & airborne pollution to retained areas.	Minor	Short term, adverse	Adoption of a suitable CEMP	Negligible
Lowland heathland (Local)	Adverse effects may arise from loss of 0.1ha of lowland heathland and accidental damage, waterborne & airborne pollution to retained habitat.	Minor	Short term, adverse	Adoption of a suitable CEMP	Negligible
Breeding birds (Site)	Temporary habitat loss and accidental damage to nests whilst in use.	Minor	Short term, adverse Potential for an offence	Nesting bird surveys prior to works.	Negligible Offence avoided
Reptiles (Site)	Adverse effects may arise from accidental damage	Minor Potential for offence	Short term, adverse	Adoption of reasonable avoidance measures during vegetation removal	Negligible Offence avoided
Invasive non-native species	Spread of plant across construction site and wider areas	Minor	Medium term, adverse	Adoption of a suitable CEMP	Negligible Offence avoided
Operational phase					
Burngullow Common & Glover Valley CWS (County)	Loss of 0.13ha of lowland heathland habitat	Minor	Permanent adverse	Creation of 1.3ha of lowland heathland and 1.1ha of mixed scrub within Existing Nature Network Area[19]	Negligible
Lowland heathland (Local)	Loss of 0.13ha of lowland heathland habitat	Minor	Permanent, positive	Creation of 1.3ha of lowland heathland within Existing Network Area.	Slight positive (significant)

[19] As identified on Lagas Map – Strategic Zones - https://lagas.co.uk/app/product/netgain_vectorzones

9. Cumulative effects

Cumulative impacts are those additional changes caused by a proposed development in conjunction with similar developments, or as the combined effect of several developments taken together.

An assessment of the cumulative impact arising from the wind farm development at this site requires that the relevant information relating to the individual impact of adjacent developments is available.

Approved developments that have the potential for a cumulative impact, and with sufficient data available within the public domain, are considered here.

- Cumulative impacts arising from two or more developments may be:
- Additive - effects are summed
- Antagonistic – the cumulative impacts are less than their summed values
- Synergistic – the cumulative impact is greater than the summed impact.

Four other turbines have been either been approved and not built out yet, or are in the planning process, within the vicinity of the assessment site. These are at Lower Longstone (permissioned), East Karslake (permissioned), Wheal Martyn (permissioned) & Burngullow turbines (not permissioned).

9.1 Breeding birds

The cumulative impact upon certain groups of target bird species from this proposed turbine and approved and/or proposed turbines in the local area has been calculated.

This calculation has been obtained by summing the estimated number of collisions (including avoidance rates) for each individual turbine. Historic data from summer vantage point surveys (carried out by Western Ecology) was used for other turbines. Cumulative impact is detailed in Table 14 below and is expressed as a total number of collisions per summer season.

Table 14. Cumulative impact of collision risk for target species for other turbines (proposed or permissioned) in local area.

Species	Estimated number of collisions (including avoidance rates) per summer season (Lower Longstones turbine)	Estimated number of collisions (including avoidance rates) per summer season (Wheal Martyn turbine)	Estimated number of collisions (including avoidance rates) per summer season (East Karslake turbine)	Estimated number of collisions (including avoidance rates) per summer season (East Karslake turbine)	Cumulative impact (total number of collisions (including avoidance rates) per summer season (March to August)
Herring Gull	0.8	0.76	0.35	0.06	1.97
Greater Black-backed Gull	0.04	Insufficient data	0.02	0.005	0.065

Lesser Black-backed Gull	0.03	0.04	0.03	0.005	0.105
Buzzard	0.12	0.32	0.28	0.08	0.8
Kestrel	0.4	0.12	0.3	0.03	0.85
Peregrine	<0.005	Insufficient data	Not recorded in area	Not recorded in area	N/A
Sparrowhawk	<0.005	Insufficient data	Not recorded in area	0.002	N/A
Mallard	Not recorded in area	Not recorded in area	0.03	0.001	0.031

With the exception of herring gull, collision estimates are below one bird per summer. For herring gull, 2 collisions are predicted per annum. This level of collision would not adverse impacts local populations.

Cumulative effects on breeding birds can be discounted.

9.1 Bats

The cumulative impact upon bats from this proposed turbine and approved and/or proposed turbines in the local area has been calculated.

This calculation has been obtained by analysing the likely impacts at both Individual and population levels for each species recorded here where the assessment site value is ‘Site’ or greater.

The assessment site is of Negligible value for Barbastelle, Nathusius’s Pipistrelle, Soprano Pipistrelle and Greater Horseshoe and these are not considered further.

The assessment site is of Site value for Myotis, Noctule, Long-eared, Greater Horseshoe, and Local value for Common Pipistrelle. For each of these species, the proposed turbine is predicted to have a negligible impact on individuals and populations and further considerations of cumulative effects can be discounted.