

BAT REPORT – USKMOUTH POWER STATION

On behalf of SIMEC Atlantis Energy



ECO00312 Uskmouth Power
Station
Bat Report
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1 INTRODUCTION

1.1.1 RPS were commissioned by SIMEC Energy Atlantic Ltd to assess the presence and activity of bat species at Uskmouth Power Station located near Nash, Newport, South Wales, centred on the Ordnance grid reference SN141 072. Objectives of bat surveys were to:

1. Assess the potential of habitats and features on site to support roosting bats and classify the quality of potential roosting features,
2. Assess the presence/absence of roosting bats in features of high and moderate potential in built structures and large trees, and
3. Assess the activity of different bat species in the power station site from transect surveys and static monitoring.

1.2 Local Status

1.2.1 The desk study undertaken for the Preliminary Ecological Appraisal (RPS, 2018) included records (of the last ten years) of common pipistrelle *Pipistrellus pipistrellus* (highest number of records), soprano pipistrelle *Pipistrellus pygmaeus*, *Myotis* species, Daubenton's bat *Myotis daubentonii*, whiskered bat *Myotis mystacinus*, Natterer's bat *Myotis nattereri* and brown long-eared bat *Plecotus auritus*. Noctule *Nyctalus noctula* bats have also been recorded in the adjoining Newport Wetlands.

1.3 Legislation

1.3.1 All British bats are legally protected under the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000. All British bats are also included on Schedule 2 of The Conservation of Habitats and Species Regulations 2017 as European Protected Species. As such measures will be required to avoid the disturbance, damage, obstruction or destruction of any roost identified within the site without a suitable derogation licence in place.

1.3.2 It is an offence to intentionally or recklessly kill, injure or capture bats, to deliberately or recklessly disturb bats (whether in a roost or not) and damage, destroy or obstruct access to bat roosts. Developments that are likely to compromise the protection afforded to bats or roosts under the provisions of the Conservation of Habitats, & Species Regulations 2017 will require a European Protected Species Development Licence (EPSDL) from Natural Resources Wales. Three tests must be satisfied before this licence (to permit otherwise prohibited acts) can be issued:

1. Regulation 44(2)(e) states that licences may be granted to “preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
2. Regulation 44(3)(a) states that a licence may not be granted unless “there is no satisfactory alternative”.
3. Regulation 44(3)(b) states that a licence cannot be issued unless the action proposed “will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range”.

2 METHODS

2.1 Ground Inspection to Assess Bat Roost Potential

Trees

- 2.1.1 An assessment for bat roost potential was carried out on all trees that could be impacted by the development due to their removal as part of the development plan, or due to the risk of possible disturbance given their proximity to the construction footprint.
- 2.1.2 A ground inspection of the trees was completed on 17th June 2019 by Laura White (GradCIEEM) and Stephen Devereaux (GradCIEEM). The inspection was carried out using close focusing binoculars and a high-powered torch as necessary. To assess the potential bat roosting suitability, a search was made for roosting features and evidence of bats as defined in Table 2.1. Trees were then assigned a category of potential suitability as a bat roost, defined in Table 2.2. The assessment was based the criteria given in the Bat Conservation Trust's Bat Surveys: Good Practice Guidelines (Collins, 2016).

Table 2.1. Potential bat roosting features and evidence searched for in trees.

Potential Bat Roosting Features	Signs Indicating Use by Bats
Natural holes	Live, dead or skeletons of bats
Woodpecker holes	Bat droppings in the roof void (particularly below ridge beam and apex
Cracks / splits in major limbs	Feeding remains e.g. insect wings
Loose bark	Tiny scratches around entry point
Hollows/cavities	Urine staining around entry point
Dense epicormic growth	Bat droppings in, around or below entry points
Bird and bat boxes	Audible squeaking at dusk or in warm weather
	Flies around entry point
	Distinctive smell of bats
	Smoothing of surfaces around a cavity

Buildings

- 2.1.3 An external inspection of buildings on-site within the application boundary was completed on 25th June 2019 by Paul Turner (MCIEEM, NE Licence No. 2017-30484-CLS-CLS). The inspection was conducted from the ground using close focusing binoculars and a high-powered torch where necessary. Endoscope external and internal inspections were carried out on 15th August by Mike Shewring (CEcol, Licence No. 74460: OTH: CSAB:2016) covering four wooden shooting hides located in Julian's Gout Land woodland and selected power station buildings.
- 2.1.4 Searches were made for features on the building exterior that could be used by roosting bats such as gaps beneath barge boards, soffits and fascia boards, gaps under lead flashing, gaps within masonry and under loose tiles, gaps between mortise and tenon joints.
- 2.1.5 Openings which could lead to suitable internal cavities were identified an assessment was made of the building structure to determine whether any gaps could lead to internal voids with potential to be used by roosting bats such as roof voids and wall cavities.
- 2.1.6 The assessment of the suitability of the buildings for roosting bats also took into account the surrounding habitat. The proximity of a building to valuable features for bats will increase the likelihood of potential roost features on the building being used. Such features include key flight lines

(such as hedgerows, tree lines, watercourses and other linear features) and foraging habitat (such as woodland edge, hedgerows, watercourses, ponds, parkland etc). Each building was then assigned a level of roost suitability as defined in Table 2.2.

Table 2.2. Categories for bat roosting potential.

Category	Criteria
Negligible Potential	No evidence, no suitable Potential Roost Features (PRFs)
Low Potential	No evidence of use, one or two features suitable for low numbers of bats, with very limited roosting potential. Limited connectivity to wider landscape with other bat habitats.
Moderate Potential	No evidence of use, several suitable features, but unlikely to support a roost type of high conservation status, connected to wider landscape with good foraging habitat.
High Potential	No evidence of use, but many suitable features for use by larger numbers of bats on a more regular basis and potentially for longer periods. Well connected to good foraging habitat and known roosts nearby.
Confirmed Roost	PRFs with evidence of use present, observation or previous records of bats confirmed to be roosting in the feature/building/tree.

2.2 Aerial and Ground Endoscope Inspections of Trees

- 2.2.1 Follow up inspections were completed of all trees on which the ground inspection could not rule out the presence of potential roost features, and of trees with potential roost features which could not be fully inspected from the ground.
- 2.2.2 The tree climbing inspections were carried out on the 18th to the 21st August 2019 by Darryn Nash who is a fully qualified tree climber and holder of an NRW bat survey licence (licence no. 79588: OTH: CSAB: 2018). All surveys were conducted in accordance with Bat Surveys for Professional Ecologists: Good Practice Guidelines (BCT, 2016) and completed in the bat active period (May – September inclusive) to avoid potential disturbance to hibernating bats.
- 2.2.3 Ground or aerial inspections of cavity features using an endoscope were chosen over emergence or re-entry surveys due to the position of trees in wooded areas with features partially obscured by leaves. The detailed physical inspection was able to more definitively confirm the suitability of potential cavities for roosting bats and search for evidence of roosting at the time of the climbing survey (individuals), as well as evidence of recent use (fresh droppings) or use as a roost by bats over a longer period (scratch marks, staining). The tree climbing survey defined where potential features seen from the ground had negligible or very low value for bats.
- 2.2.4 Potential roost features were inspected physically using a torch, mirror and an endoscope to search for live bats or any evidence of use by bats such as droppings, claw marks, staining and polishing. Around each feature searches were made for evidence of use by bats such as staining below a hole, smoothing of bark and bat droppings. For features at height, or for trees where the ground inspection could not rule out the presence of elevated features, the inspection was carried out by a qualified tree climber with a full NRW bat survey licence.
- 2.2.5 Notes were made on:
- Type of feature/enclosure of space
 - Dimensions and cavity depth
 - Height above ground level
 - Orientation /aspect

- Evidence of bat activity
- Additional information affecting likelihood of use by bats

2.3 Bat Dusk Emergence / Dawn Re-entry Surveys

- 2.3.1 Bat emergence / re-entry surveys of buildings were carried out in accordance with good practice guidelines as outlined by the Bat Conservation Trust (BCT, 2016). Dusk emergence surveys commenced 15-30 minutes prior to sunset and continued until 90 minutes after. Dawn re-entry surveys commenced 90 minutes prior to sunrise and continued until 15-30 minutes after.
- 2.3.2 The initial survey effort for buildings or structures was defined by the bat roost potential category assigned for the building following the daytime inspection with a minimum of one, two or three surveys for structures with low, moderate or high potential to support roosting bats respectively. Trees with moderate or high potential to support roosting bats received two or three survey visits respectively.
- 2.3.3 During the first and / or second survey visits, if evidence of use by bats is recorded, additional surveys are required to ensure the roost is accurately characterised in accordance with survey guidelines (BCT, 2016).
- 2.3.4 Surveys were conducted in suitable weather conditions as prescribed in the good practice guidelines (see Table 2.3) and were carried out utilising teams of surveyors to give good coverage of all potential roost features.

Table 2.3. Bat emergence / re-entry survey dates, weather conditions and surveyors.

Date	Building / Structure and survey No.	Weather Conditions *	Sunset / Sunrise	Start Time	End Time
29/08/2019	Tree T2 (1/1)	Dry, 17°C, cloud cover 8, moderate breeze (B3/4)	20:05	19:50	21:35
29/07/2019	Woodland Shooting Hide (1/1)	Dry, 20°C, cloud cover 1, no breeze (B0)	21:05	20:50	22:10
31/07/2019	Transfer Tower (1/1)	Dry, 19°C, cloud cover 1, moderate breeze (B3)	21:02	20:45	22:35
29/08/2019	Garage of Emulsifier Building (1/1)	Dry, 17°C, cloud cover 8, moderate breeze (B3/4)	20:05	19:50	21:35
20/08/2019	Flyover Bridge - South End (1/3)	Dry, 16°C, cloud cover 3, light breeze (B2)	20:25	20:10	21:55
29/08/2019	Flyover Bridge - South End (2/3)	Dry, 14°C, cloud cover 6, light air (B1)	06:19	04:49	06:34
17/09/2019	Flyover Bridge - South End (3/3)	Dry, 16°C, cloud cover 0, light air (B0/B1)	19:22	19:07	20:52
07/08/2019	Flyover Bridge - North End (1/3)	Dry, 18°C, cloud cover 1, moderate breeze (B3)	20:50	20:23	22:20
21/08/2019	Flyover Bridge - North End (2/3)	Dry, 13°C, cloud cover 7, light breeze (B2)	20:23	20:08	21:53
18/09/2019	Flyover Bridge - North End (3/3)	Dry, 11°C, cloud cover 0, no breeze (B0)	06:50	05:20	07:15

*Wind speed is given as the Beaufort Scale of 1 – 12. Cloud cover is stated as Okta 0 – 8.

2.4 Bat Activity

Activity Transect Surveys

- 2.4.1 Bat activity surveys were carried out in line with good practice guidelines as outlined by the Bat Conservation Trust (BCT). Two activity transects about the site were carried out each month of the bat survey season for 2018 and 2019 (September-October 2018 and April-August 2019). This followed two fixed routes on the west and east side of the site.
- 2.4.2 The fixed transect route included the majority of habitats on-site, around buildings, along tree lines across the site and along the edge of the deciduous woodland, around waterbodies and scrub. Point counts were carried at five locations along each transect route.
- 2.4.3 For the purposes of the bat activity survey the site has been subdivided into different areas based on the habitat and location within the site and these are shown on Figure 1 along with the transect routes and point count locations. The transect routes did not specifically cover the power station buildings and adjoining hardstanding (Area F) but commuting and foraging activity was noted during emergence surveys of the garages and transfer tower.

Eastern Route Point Counts:

- PC 1 - Edge of the Woodland Block (Area)
- PC 2 - North end of D1 and D2 (North and South Drain) (north end of Area B)
- PC 3 - Eastern corner of the Laydown Area (Area B)
- PC 4 - Beneath the lamppost at the southern end of the flyover/bridge (Area D/B border)
- PC 5 – Western end of the Interceptor Ditch D4 (Area D) at the edge of the scrub and woodland in Area E

Western Route Point Counts

- PC 6 – Beside scrub north of the gas plant, in Area H
 - PC 7 – On the jetty in Area H
 - PC 8 – North end of the sea wall in Area H
 - PC 9 – South end of the sea wall in Area E
 - PC 10 – Beside Ponds P1 and P2 in Area E
- 2.4.4 Surveys commenced at sunset (or within a suitable time period before/after) with the route walked at a steady pace recording any bats encountered as well as numbers and behaviour where possible. At the point counts the surveyor recorded any bat activity over a five-minute period before continuing the transect.
- 2.4.5 All surveys were conducted in suitable weather conditions as prescribed in the good practice guidelines (BCT) (see Table 2.4).
- 2.4.6 Each survey was carried out using a BatLogger M, recording constantly throughout the survey. This also recorded metadata such as GPS, temperature, date and time. The data was then analysed using Bat Explorer software.

Table 2.4. Bat activity transect survey dates, weather conditions and surveyors.

Date	Survey Number	Surveyors	Weather Description	Sunset/ Sunrise	Start Time	End Time
25/09/2018	1	Kate Davies & Mike Shewring	Dry, 15°C, 25% cloud, moderate breeze (B3)	19:03	18:58	21:25
23/10/2018	2	Kate Davies & Georgia Kelly	Dry, 13°C, 70% cloud, light breeze (B2)	18:02	17:58	20:30
24/04/2019	3	Kate Davies & Laura White	Dry, 12°C 100% cloud, low/moderate breeze (B3)	20:23	20:20	22:45
22/05/2019	4	Kate Davies & Laura White	Dry, 15°C, 50% cloud, low breeze (B2)	21:07	21:10	23:20
19/06/2019	5	Kate Davies & Laura White	Dry, 15°C, 40% cloud, low breeze (B2)	21:32	21:35	23:45
30/07/2019	6	Tim Oliver & Laura White	Dry, 17°C, 70% cloud, gusty breeze (B4)	21:02	21:05	23:35
02/09/2019	7	Kate Davies & Stephen Devereaux	Mostly dry with occasional light showers, 16°C, 80% cloud, light breeze (B2)	19:56	19:56	21:50

Static Detector Recording

- 2.4.7 A total of four automated detector locations were deployed per month, over 7 months, covering autumn 2018 and spring and summer 2019. The locations of the detectors in the first five months were selected by using a random sampling strategy to avoid data distortion of the subsequent analysis. The locations in June 2019 and July 2019 were selected to provide greater coverage of areas to be affected by development proposals.
- 2.4.8 The detectors were deployed for a minimum of five nights per location with recording commencing 30 minutes prior to sunset until 30 minutes after sunrise. A full description of detector locations and deployment time is set out in Table 2.5 and the locations are shown Figure 2.
- 2.4.9 The use of automated detectors allowed the collection of quantitative datasets which complements the more qualitative data collected during the activity transects outlined below. Analysis was carried out using Kaleidoscope software.

Table 2.5. Static detector locations and recording dates.

Location Area	Habitat Description	Detector Locations	Recording Periods
Area A (Woodland Block)	Woodland block, North Reen, scrub, bramble thicket and grassland	15	24 th – 29 th April 2019
		15	24 th – 29 th April 2019
		15	12 th – 17 th May 2019
		20	22 nd – 27 th May 2019
		20	14 th – 19 th June 2019
		23	24 th - 25 th July 2019
Area B (Laydown Area)	Bare ground, South Reen, sparsely vegetated piles of coal ash, ephemeral pool and regeneration, boundary woodland and scrub edge and regenerated grassland.	10	23 rd – 28 th October 2018
		14	15 th – 20 th April 2019
		16	24 th – 29 th April 2019
		16	12 th – 17 th May 2019
		17	17 th – 22 nd May 2019
		22	26 th June – 1 st July 2019
		22	16 th – 21 st July 2019
Area C (Rail line and managed grassland)	Amenity grassland, rail line, coal store, individual trees and hardstanding.	1	22 nd – 27 th August 2018
		2	22 nd – 27 th August 2018
		18	17 th – 22 nd May 2019
Area D (Coal Storage Area and Lamby's Lake)	Coal Storage Area with hardstanding, bare ground and spoil heaps, Lamby's lake, wetland reen, interceptor ditch, tall ruderals and scattered scrub.	7	20 th – 25 th September 2018
Area E (Western Section of Power Station)	Woodland, grassland, scattered scrub, reed bed, ponds P1, P2 and saltmarsh.	4	25 th – 30 th August 2018
		6	26 th September – 1 st October 2018
Area F (Gas and Coal Power Station Buildings and National Grid Sub-station)	Buildings, infrastructure and hardstanding all associated with the powerplant footprint, small areas of ruderal vegetation or amenity grassland.	None	None
Area G (Cooling Towers and Managed Grassland)	Cooling towers, associated hardstanding, amenity grassland, woodland strip on northern boundary, individual trees/tree line and areas of buried asbestos beneath amenity grass.	9	23 rd – 28 th October 2018
		13	17 th – 22 nd April 2019
		19	22 nd – 27 th May 2019
		19	14 th – 19 th June 2019
		21	26 th June – 1 st July 2019
		21	16 th – 21 st July 2019
Area H (North-western section of power station)	Dense scrub, bramble thicket, intertidal mud, hardstanding, salt marsh, intertidal rocks and boulders.	3	22 nd – 27 th August 2018
		5	26 th September – 1 st October 2018
		8	23 rd – 28 th October 2018

2.5 Limitations & Constraints

Emergence Surveys

- 2.5.1 Due to an extremely high level of mosquito activity within the woodland at the time of the survey of the woodland shooting hut, surveyors did not remain in their positions once their view of the hide was compromised by low light levels, the level of light reduced early in the survey due to the dense tree canopy. A static recorded was left in-situ to record the following bat activity during the survey period and collected at the end of the survey. A daytime inspection using an endoscope was undertaken in place of a single emergence survey for each of the shooting hides.
- 2.5.2 Due to the dense mature scrub, a few sections of the flyover bridge had obscured visibility from surveyor positions for the emergence surveys.

Bat Activity Surveys

- 2.5.3 The last activity survey, August 2019 was delayed by four days due to weather constraints, the survey was completed on 2nd September but will be used to represent the activity of bats on site for the end of August 2019.

Static Data Recording

- 2.5.4 Recording location 23, when analysed, has results for two days instead of five, this is due to the memory card becoming corrupted. Data was not successfully recorded by the static detectors at locations 11 and 12. Both these locations were situated near the woodland edge and bridge, adequate descriptions of these habitats for bat activity has subsequently been provided in the results for transect surveys and emergence surveys near these locations.

3 RESULTS

3.1 Ground Level Inspections

- 3.1.1 Descriptions and roost suitability of all buildings and structures that have low, moderate or high potential for roosting bats are summarised below in Table 3.1 (for buildings that require emergence surveys, results are detailed in **Section 3.3**).
- 3.1.2 Full details of all building and structure descriptions from the ground inspection are provided in Appendix A. All photographs (plates) from the ground inspection are presented in Appendix B and all building/ structure locations and their roost suitability is illustrated in Figure 3.

Table 3.1 Description and suitability of buildings with low - high potential to support roosting bats.

Building Name	Descriptions of Main Features	Plate Number	Bat Roost Suitability
Flyover Bridge	The flyover bridge is constructed of prefabricated interlocking sections. Between each section there are expansion gaps which are step shaped in profile, with downward facing openings on the bridge underside. Some of the gaps are capped at each end by a concrete plate, while others are open leaving horizontal facing openings in the sides of the bridge which would allow bats to enter the gap.	1 - 3	High
	There are horizontal gaps on either side of the top of each of the bridge supports, and also between the bridge underside and concrete abutment at each end. These gaps appear to span the width of the bridge and potentially conceal cavities.		(Confirmed roost for pipistrelle species, see Section 3.3)
	There are several additional openings on the underside of the bridge between concrete sections and where there has been corrosion of the concrete.		
Woodland Hides	Openings in the walls provide access into the hides. There are also narrow gaps around the underside of the roof edges with the potential for small cavities between the walls and roof edge surround. No evidence of bats. Negligible maternity roost potential. No suitable habitat for crevice dwelling bats. Low/ moderate potential for use as a feeding perch by free hanging bat species.	4 - 5	Low
Transfer Tower	The building is largely in a good state of repair with no significant openings in the wall fabric.	9 - 11	Low / moderate
	Where the conveyor housing joins the building approx. 6-8m up on the north and east elevations, the surrounding sheet metal is lifted approximately 5cm from the wall leaving a tapering gap approximately 20cm deep. There appears to be an opening in the underlying concrete which could open into a larger cavity.		
	There are also some small gaps where a projecting metal housing joins the southern elevation at about 6m height.		
Garage of Emulsifier Building	A broken window pain on the north elevation gives access to the interior.	17 - 18	Low/ Moderate
	South End: Soffit/ barge board present here. Building is single storey and of brick construct with flat metal sheeting roof and metal sheeting soffit. Endoscope was applied as far as possible. Suitable crevice present and inaccessible areas present due to angle of construction (endoscope unable to bend).		

3.2 Aerial and Ground Endoscope Inspections of Trees

- 3.2.1 Confirmed bat roosts were found in seven Schwegler bat boxes mounted on four mature trees along the treeline and edge of the woodland block (Table 3.2, Figure 3).
- 3.2.2 Following the climbing/endoscope inspections only four trees were identified as having natural cavity features of moderate potential to support roosting bats. Three of these were individual willow and Italian alder trees located in the managed grassland to the south of the coal fired power station (Area C) with the fourth in the north-eastern corner of Julian’s Gout Land woodland (Area A). The full description of all trees inspected during the aerial survey can be found in Appendix C and the trees with confirmed bat box roosts or having moderate/high potential are illustrated on Figure 3.
- 3.2.3 Tree T2 is a Lombardy poplar located at the end of a tree line of poplars alongside the North Drain with connectivity to the woodland block is categorised as having low potential to support roosting bats but deemed too dangerous to climb during the aerial inspection survey. Therefore, an emergence survey was conducted on this tree to confirm its presence of roosting bats.

Table 3.2. Summary of results from tree climbing survey.

Tree Reference	Features and evidence of Bats Found	Bat Roost Status
T5	All three bat boxes were inspected for signs of bats. The lowest box contained a single soprano pipistrelle and was left in situ. The middle box did not contain any evidence of use. The highest box showed signs of recent use by bats (pipistrelle droppings).	Confirmed soprano pipistrelle roost and a pipistrelle species roost.
T6	All three bat boxes were inspected for signs of bats. A single soprano pipistrelle was encountered in both the lowest and middle boxes whilst a brown long-eared bat was seen in the top box.	Confirmed soprano pipistrelle roost, a pipistrelle species roost and a brown long-eared bat roost.
T11	Both bat boxes were inspected. One had evidence of recent use (pipistrelle droppings); the second had no signs of use.	Confirmed one probable pipistrelle species roost.
T19	All three bat boxes were inspected for signs of bats. The lowest box had a bee’s nest. The middle box was empty with no signs of use by bats. The highest box contained recent evidence of bats (pipistrelle droppings).	Confirmed one probable pipistrelle species roost.
T2	Tree unsafe to climb.	Emergence survey conducted.

3.3 Bat Emergence/Re-entry Survey

Flyover Bridge

- 3.3.1 Eight common pipistrelle day roosts were recorded in the structure of the flyover bridge (Roosts A, B, C, D, F, G and H). Use of the different roost features varied between the survey visits with only two of the features (Roosts D and H) being associated with roost activity over all three roost surveys. Individual soprano pipistrelle bats were recorded in two of the roosts (Roost D and Roost F).
- 3.3.2 An undefined pipistrelle species (common / soprano) 50Khz was recorded re-entering an expansion gap in Section 8 (Roost E), with no other roost emergence or re-entry at this point.

- 3.3.3 Details of emergences are detailed in Table 3.3 and are illustrated on Figure 4.
- 3.3.4 Eleven common pipistrelles emerged from roost features in the northern half of bridge on both 7th August and 21st August. In comparison very low number of re-entries during the dawn survey on the 18th September but activity was noted around Roost F from a distance during the dawn survey of the southern half of the bridge.
- 3.3.5 A maximum of 13 common pipistrelle bats emerged from features in the southern half of the bridge with the peak count from 17th September 2019. Eight common pipistrelles emerged from the southern half on 20th August and five common pipistrelles re-entering features in the bridge on 29th August.
- 3.3.6 A single soprano pipistrelle was recorded over three surveys with an individual bat re-entering Roost D on 29th August.
- 3.3.7 Six of the roosts were associated with the narrow crevice created by expansion gaps built into the structure of the bridge. Each expansion gap was an L-shaped crevice, running the width of the bridge, between two sections of concrete (Appendix B, Plate 2). In total, there are seven expansion gaps, six of which had recorded use as roosts with emerging and/or re-entering bats during the surveys.
- 3.3.8 Two additional roost emergence points were located where the bridge sits upon a concrete support and a shelf like crevice is formed and where a brick insert is missing and has created a small crevice on the northern end of the bridge.

Table 3.3. Summary of roost activity in the flyover bridge.

Roost / Bridge Section	Date & Sunset/ Sunrise	Feature	Species	No. bats	Time of emergences (first – last)
A / S2	20/08/2019 20:25	Expansion Gap	Common pipistrelle	3	20:41 – 20:45
B / S2	29/08/2019 06:19	Expansion Gap	Common pipistrelle	3	05:35 – 05:43
B / S2	17/09/2019 19:22	Expansion Gap	Common pipistrelle	7	19:50 – 20:02
C / S3	20/08/2019 20:25	Gap between the top of the concrete support and underside of the bridge (S2/ S3)	Common pipistrelle	2	20:40 – 20:50
C / S3	17/09/2019 19:22	Gap between the top of the concrete support and underside of the bridge (S2/ S3)	Common pipistrelle	2	19:50 – 19:55
D / S6	20/08/2019 20:25	Expansion Gap	Common pipistrelle	3	20:43 – 20:53
D / S6	29/08/2019 06:19	Expansion Gap	Soprano pipistrelle	1	05:56
D / S6	29/08/2019 06:19	Expansion Gap	Common pipistrelle	1	05:26
D / S6	17/09/2019 19:22	Expansion Gap	Common pipistrelle	4	19:50 – 19:38
E / S8	18/09/2019 06:50	Expansion Gap	Common pipistrelle	1	06:28

F / S8	07/08/2019 20:50	Expansion Gap	Common pipistrelle	10	20:49 – 21:15
F / S8	07/08/2019 20:50	Expansion Gap	Soprano pipistrelle	1	21:13
F / S8	21/08/2019 20:23	Expansion Gap	Common pipistrelle	8	20:26 – 20:45
G / S10	21/08/2019 20:23	Gap in inset brickwork	Common pipistrelle	1	20:36
H / S10	07/08/2019 20:50	Expansion Gap	Common pipistrelle	1	21:07
H / S10	21/08/2019 20:23	Expansion Gap	Common pipistrelle	2	20:40
H / S10	18/09/2019 06:50	Expansion Gap	Common pipistrelle	1	06:10

Table 3.4. Summary of use of roost features in the flyover bridge.

Roost	Feature	Species	Recorded use of feature	Peak Count
A	Expansion gap	Common pipistrelle	1 of 3 survey visits	3
B	Expansion gap	Common pipistrelle	2 of 3 survey visits	7
C	Gap between support and underside of bridge	Common pipistrelle	2 of 3 survey visits	2
D	Expansion gap	Common pipistrelle	3 of 3 survey visits	4
		Soprano pipistrelle	1 of 3 survey visits	1
E	Expansion gap	Pipistrelle species	1 of 3 survey visits	1
F	Expansion gap	Common pipistrelle	2 of 3 survey visits	10
		Soprano pipistrelle	1 of 3 survey visits	1
G	Gap in inset brickwork	Common pipistrelle	1 of 3 survey visits	1
H	Expansion gap	Common pipistrelle	3 of 3 survey visits	2

Transfer Tower

- 3.3.9 No bats emerged from the building during the survey. Shortly after dusk, security lights inside and outside of the tower automatically switched on and the internal lighting especially reduced the likelihood of the building being utilised by bats. The level of lights and lack of activity during the survey reduced the roost category from moderate/low to negligible and no further surveys are conducted on the building.
- 3.3.10 Common and soprano pipistrelle are recorded commuting past the transfer tower and occasionally foraging around the Coal Storage Area immediately south of the building. Noctules are recorded commuting high overhead as well during the survey.

Woodland Shooting Hides

- 3.3.11 No bats were seen to emerge from Hide 2 during the beginning of the survey and 20 minutes after sunset, after which the light level was too low beneath the tree canopy for surveyors to confirm emergence. Activity recorded during this survey consisted of common and soprano pipistrelle foraging with the first registrations over 40 minutes after sunset, at times that are later than their usual respective emergence times.

- 3.3.12 Further emergence surveys of the shooting hides were replaced by detailed external and internal endoscope inspections.

Garage of Emulsifier Building

- 3.3.13 The ground level endoscope inspection by a licensed ecologist (see above in Section 3.1) found a feature at the southern end of the garage. One surveyor was positioned covering this feature during the emergence survey. No bats are seen emerging from the garage. During this survey, few very bats were recorded over the two-hour period. A single common pipistrelle was observed commuting from the south, in a north-easterly direction and there were two brief registrations of noctule bats indicating overhead passes of commuting bats.

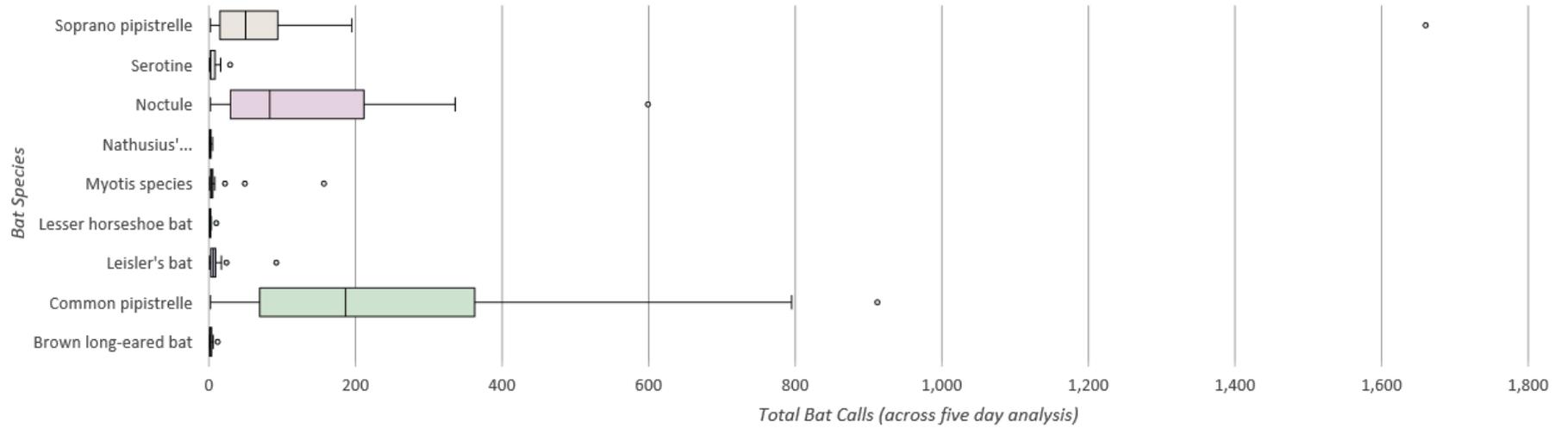
3.4 Bat Activity

- 3.4.1 The results of bat activity transect surveys and static detector recordings has been combined to assess the activity of bat species across the whole site and in relation to site areas (Areas A-H).
- 3.4.2 The summarised findings of activity transect surveys are illustrated in Figure 5 and a summary of static detector recordings are presented in Appendix D.

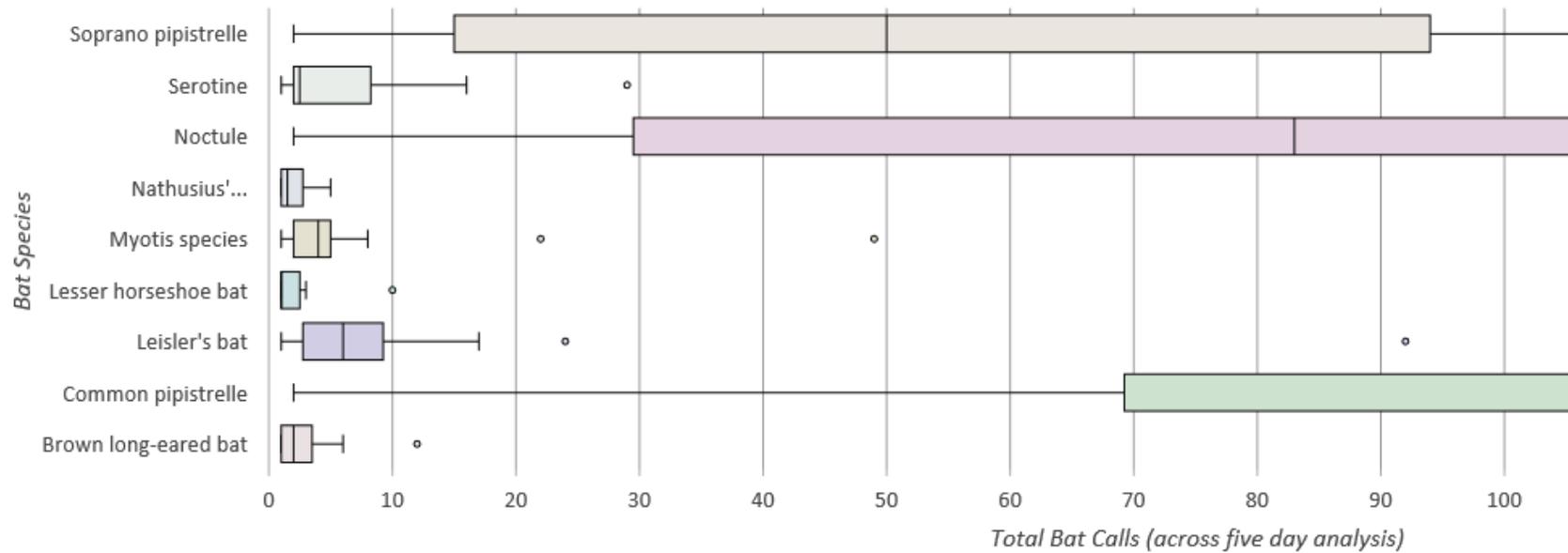
Species Summary

- 3.4.3 Common pipistrelle was recorded with the greatest number of passes across the site (see Graph 3.1 and 3.2 below), in particular around the flyover bridge and woodland block. The peak number of passes was recorded in Area C adjacent to mature trees in managed grassland (Location 2). Noctule and soprano pipistrelle are the next highest recorded species, the peak number soprano pipistrelle passes is recorded in Area E by Ponds P1 and P2 (Location 4) and the peak number of noctule passes are recorded in Julian's Gout Land woodland (Area A, Location 15).
- 3.4.4 The peak activity of *Myotis* species was recorded at Lamby's Lake at Location 7 (with 157 passes over the five-day recording period) with *Myotis* species calls detected at lower numbers at several recording locations (with up to 49 passes, see Graph 3.2).
- 3.4.5 Noctule/Leisler's bats *Nyctalus leisleri*, serotine *Eptesicus serotinus*, brown long eared bats and lesser horseshoe *Rhinolophus hipposideros* bats are recorded occasionally across site but all in very low numbers.
- 3.4.6 Nathusius' pipistrelle *Pipistrellus nathusii* is only recorded in very low numbers, in Area D (Locations 7 and 14) by Lamby's Lake and once in Area G and Area H (Locations 21 and 5 respectively).

BAT REPORT



Graph 3.1 Distribution of total bat calls (across five-day analysis) for all bat species recorded across the whole site.



Graph 3.2 Distribution of graph 3.1 on closer scale to show values between 0-20 calls.

Area A – Woodland Block

Activity Transect Survey

- 3.4.7 During each of the activity transects, high levels of foraging activity were detected along the tree line on the northern bank of the North Drain with direct connection to the Julian's Gout Land woodland block. The most abundant species was common pipistrelle, with soprano pipistrelle present in lower numbers.
- 3.4.8 High levels of common and soprano pipistrelles were also recorded, on all transect surveys, around the north end of the flyover bridge as well as over the scrub to the east of the flyover bridge and over the scrub corridor alongside the North Drain. Individual pipistrelle bats were recorded commuting over the southern edge of the woodland block and flying north-south by Julian's Pill (PC1) on all activity surveys. Commuting bats recorded in Area A were common pipistrelle, soprano pipistrelle and noctule.

Static Detector Recording

- 3.4.9 Data was recorded from three positions; Locations 15, 20 and 23 positioned in the centre of the woodland block (April-May 2019), on the southern woodland edge alongside the North Drain (April - June 2019), and by mature scrub at the northern end of the flyover bridge (July 2019).
- 3.4.10 Species present in high numbers are common pipistrelle, soprano pipistrelle and noctule, the highest numbers of these three species are recorded in the centre of the woodland (see Appendix D).
- 3.4.11 Species with a small number of passes recorded within the woodland were serotine, *Myotis* species, noctule/Leisler's bat, brown long eared bat and lesser horseshoe bat.
- 3.4.12 At the northern end of the flyover bridge (Location 23) serotine and noctule/Leisler's bat were recorded at low frequency with a moderate number of *Myotis* species and noctules passes.

Area B – Laydown Area and Eastern Section of Rail Line

Activity Transect Survey

- 3.4.13 Little activity is recorded over the sparsely vegetated ground alongside the rail line north of the South Drain. Dense scrub between the South Drain and the boundary ditch was not accessible but activity on the northern edge of the habitat was low.
- 3.4.14 The southern part of Area B is open ground with established vegetation limited to the boundaries and was associated with very low levels of bat activity during transects and at PC2 the only records were of a few commuting noctules, soprano and common pipistrelles across all the transect surveys.
- 3.4.15 In Area B, highest activity was recorded over grassland and scrub on the eastern side of the flyover bridge. Extended periods of common pipistrelle foraging were recorded in this location during all the transect surveys, with peak activity is recorded during the June and July surveys. Soprano pipistrelles were also recorded in lower numbers.

Static Detector Recording

- 3.4.16 The recording locations were at the western end of the South Drain in June-July 2019 (Location 22), the eastern end of the rail line in May 2019 (Location 17), along the entry road to the Laydown Area in October 2018 (Location 10) and in the centre of the Laydown Area in April-May 2019 (Location 16).

- 3.4.17 The highest number of bat passes were recorded is at Location 22, and the species present were common pipistrelle, soprano pipistrelle, noctule and noctule/Leisler's bat in June with serotine also recorded in July.
- 3.4.18 Common pipistrelle, soprano pipistrelle and noctule record the highest number of passes across all locations in Area B. Noctule/Leisler's bats are recorded in the central Laydown Area in four out of six locations. Serotine bats were only recorded at Location 22 with individual passes of *Myotis* species and brown long eared bats at the same location.

Area C – Western Rail Line and Managed Grassland

Activity Transect Survey

- 3.4.19 During the transect surveys, low numbers of commuting common and soprano pipistrelles were recorded at the southern end of Area C, flying northwards from the Coal Storage Area or foraging around the individual mature trees.
- 3.4.20 During emergence surveys of the flyover bridge, noctules are also recorded foraging around the trees in Area C.

Static Detector Recording

- 3.4.21 Static recording in Area C covered four positions in the managed grassland alongside the railway lines, with each location close to the mature trees. The survey coverage in Area C was August 2018 (Location 1 and 2), May 2019 (Location 18) and July 2019 (Location 24).
- 3.4.22 The highest number of passes were common pipistrelle; recorded at all locations with Location 2 (close to several mature trees) recording the largest number of passes. Soprano pipistrelles and noctules are also recorded at Location 24 and in lower numbers at Location 1 and 18.
- 3.4.23 Other species recorded in Area C, as individual passes, include serotine (Location 24), *Myotis* species (Locations 2, 18 and 24), noctule/Leisler's bat (at 18 and 24) and brown long-eared bat (Location 18).

Area D – Coal Storage Area and Lamby's Lake

Activity Transect Survey

- 3.4.24 Common and soprano pipistrelles were recorded foraging over Lamby's Lake during most transect surveys (except April 2019) and *Myotis* species are recorded foraging above the lake in May and June 2019 with the flight behaviour, low over of the water, indicative of Daubenton's bat.
- 3.4.25 High levels of noctule activity were recorded during transect surveys in spring and summer 2019, with activity frequently associated with the streetlamp on the main internal road to the south of the flyover bridge. Common and soprano pipistrelles are also recorded foraging above the light for long periods of time.
- 3.4.26 Occasional common pipistrelles and noctules commute across the Coal Storage Area northwards towards the power station during all transect surveys. During transect surveys between May and August 2019, soprano pipistrelles are recorded emitting high levels of social calls whilst foraging above the boundary ditch in the south-western corner of Area D (PC5).
- 3.4.27 During transects in June and July 2019, common pipistrelles are recorded foraging inside a large open sided shed building (Appendix B, Plate 15) and in front of the transfer tower by a security light; both located on the northern boundary of the Coal Storage Area.

Static Detector Recording

- 3.4.28 Static recordings in Area D were from the north end of the flyover bridge, close to the tree line in April 2019 (Location 14) and on the southern side of Lamby's Lake in September 2018 (Location 7).
- 3.4.29 At Location 7 the most frequently recorded species were common pipistrelle, soprano pipistrelle and *Myotis* species. Other species recorded were noctule/Leisler's bat, *Nathusius* pipistrelle, noctule, and brown long eared bat.
- 3.4.30 At Location 14, the highest number of passes were noctule, common pipistrelle and soprano pipistrelle (respectively). Other species recorded with a lower number of passes were noctule/Leisler's bat, *Nathusius* pipistrelle, serotine and *Myotis* species.

Area E – South-western Area of the Power Station

Activity Transect Survey

- 3.4.31 Common and soprano pipistrelles are recorded foraging above Ponds P1 and P2 and the adjoining scrub with up to five common pipistrelles foraging at one time. The pipistrelle species were also recorded commuting and occasionally foraging over grassland and scrub on the northern edge of the restored landform.
- 3.4.32 Common and soprano pipistrelle were also recorded both foraging and commuting along the western extent of Area E during the transect surveys and at the point count PC9. Noctule was also regularly observed commuting northwest over the River Usk estuary following the path above the sea wall and pylons.

Static Detector Recording

- 3.4.33 Static recording locations in Area E are situated by Pond P2 (Location 4) and beside a small group of mature mixed trees and scrub on the restored landform (Location 6) in August and September 2018 respectively.
- 3.4.34 Soprano pipistrelle was the most frequently recorded species at Location 4. Common pipistrelle, *Myotis* species, brown long-eared bat and noctule passes are also recorded in lower numbers with more common pipistrelle passes than the other species.
- 3.4.35 Low levels of activity were recorded at Location 6 (August 2018), with common pipistrelle the most commonly recorded species. Other species present include serotine, *Myotis* species, noctule/Leisler's bat, noctule and soprano pipistrelle, all with fewer than 10 passes across the five recording days.

Area G – Cooling Towers and Managed Grassland

Activity Transect Survey

- 3.4.36 Common pipistrelles are recorded foraging along the northern boundary associated with the off-site bramble thicket and scrub / woodland.
- 3.4.37 Foraging common pipistrelles were recorded continuously at the south-eastern boundary of Area G associated with the North Drain tree line, western edge of Julian's Gout Land woodland end and a small group of mature trees.
- 3.4.38 Noctule and common pipistrelles are recorded on all transect surveys commuting from the northwest over the River Usk into Area G. Noctule bats are seen foraging over the amenity grassland to the south-east of the cooling towers, with the level of foraging highest during mid-summer (May-July 2019) with lower numbers recorded during all the other months.

Static Detector Recording

- 3.4.39 The static recording locations for Area G were on the northern boundary of the site in October 2018 (Locations 9) and in April 2019 (Location 13), adjacent to the cooling tower buildings in June and July 2019 (Location 21) and in the grassland adjacent to the group of mature trees in May and June 2019 (Location 19).
- 3.4.40 Common pipistrelle is the most recorded species across all locations in Area G, with the exception of Location 9 which recorded only 17 passes across five days for all bat species. The greatest number of passes for this species is recorded at Location 19 in May 2019 and the second highest at the same Location in June 2019.
- 3.4.41 Noctule bat is the next most recorded species in Area G, with the greatest number recorded at Location 13, on the site boundary to the north of the main power station buildings. Soprano pipistrelles were most frequently recorded at Location 13 with lower levels of activity at Locations 19 and 21.
- 3.4.42 Other species recorded in low numbers across Area G are *Myotis* species (at Locations 9, 13 and 21) and noctule/Leisler's bat (at all locations).
- 3.4.43 A single lesser horseshoe bat pass was recorded at Location 13 and brown long-eared bats and Nathusius' pipistrelles were recorded on the detector placed next to the cooling tower buildings (Location 21).

Area H – North-western Area of the Power Station

Activity Transect Survey

- 3.4.44 Relatively low levels of bat activity are recorded in Area H which lies between the power station and national grid substation buildings and the sea wall. The eastern section is dense scrub and the western section is a mix of patchy scrub (with abundant butterfly bush) growing on stone surfaced ground with only sparse herbaceous vegetation with some areas of more established grassland and scrub.
- 3.4.45 Common and soprano pipistrelle are occasionally recorded foraging over scrub, tall herb, grassland in Area H and at the former jetty (PC7). Noctule was also regularly observed commuting northwest over the River Usk estuary following the path above the sea wall and pylons.

Static Detector Recording

- 3.4.46 The static recording locations in Area H were by the jetty on the northern site boundary (Locations 3 and 5) in August and September 2018 respectively and by bramble thicket and scrub by the sea wall on the western site boundary (Location 8) in October 2018.
- 3.4.47 Common pipistrelle was the most recorded species in Area H with the highest number of passes at the jetty (Location 5). Other species recorded in area H in low numbers, include serotine, *Myotis* species, noctule, noctule/Leisler's bat, and soprano pipistrelle. A single Nathusius' pipistrelle pass is recorded at Location 5.

4 CONCLUSIONS

4.1 Roosts

- 4.1.1 Eight common pipistrelle day roost features were recorded in the structure of the flyover bridge which runs parallel to main site access road in the eastern half of the power station site. Two of the roost features also had recorded use by individual soprano pipistrelle bats.
- 4.1.2 Up to 11 common pipistrelle bats from the northern half of the bridge in a single survey. The maximum emergence from the southern half of the bridge was 13 common pipistrelles.
- 4.1.3 No roosts were recorded in any of the other buildings or built structures.
- 4.1.4 No roosts were recorded in natural cavity features in the larger trees present within the power station site. Seven bat boxes attached to four Lombardy poplars in the tree line adjoining the North Drain had confirmed use by bats. Three boxes were being used by individual soprano pipistrelle bat, one box was being used by an individual brown long-eared bat and three further boxes contained pipistrelle droppings confirming recent use.
- 4.1.5 Following the tree climbing inspections, three individual trees located to the south of rail line in centre of the site (Area C) were found to have moderate potential to support roosting bats, along with a single tree in the north-eastern part of the woodland block. The other trees were classified as having low or negligible value based on the number and limited depth of the potential cavity features noted from the ground.

4.2 Activity

- 4.2.1 At least eight bat species were recorded during surveys of activity across the site. Common pipistrelle, noctule and soprano pipistrelle were the most frequently found across the site, with passes of these species detected in all areas of the site and localised areas of high levels of foraging activity. *Myotis* species bat activity was associated with the waterbodies, and Lamby's Lake in particular.
- 4.2.2 The main areas for foraging bats include the woodland block and tree line (Area A), the scrub surrounding the flyover bridge (western edge of Area B), managed grassland to the north of the Lombardy poplar tree line (Area G) and managed grassland with individual trees in the centre of the site (Area C).
- 4.2.3 Where possible bat roosts should be retained and protected from both direct and indirect disturbance. Any development activities that could affect bat roosts would need to be covered by a European Protected Species Development Licence (EPSDL) for bats obtained from NRW. Appropriate mitigation and species protection would need to be incorporated into the measures included in the method statement designed to provide alternative roosts and maintain the status of bat populations at the site.
- 4.2.4 Development within the site will also need to consider the potential effects on foraging and commuting activity with habitats within the site having value for the bats roosting within and outside of the power station site. Considerations would include a reduction in the extent of habitats, changes in the context of retained habitats and indirect impacts from lighting, operational noise.

5 REFERENCES

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MAGIC Interactive Map. Available from: <http://www.magic.gov.uk/home.htm>.

Mitchell-Jones, A, J, (2004) Bat Mitigation Guidelines.

RPS (2018) Preliminary Ecological Appraisal.

FIGURES

- **Figure 1.** (ECO00312-ECO-001) Bat Activity Survey Transect Route
- **Figure 2.** (ECO00312-ECO-002) Static Bat Detector Locations Map
- **Figure 3.** (ECO00312-ECO-003) Building and Tree Reference Map
- **Figure 4.** (ECO00312-ECO-004) Bat Emergence Results – Flyover Bridge
- **Figure 5.** (ECO00312-ECO-005) Bat Activity Transect Results Summary



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Legend

- Approximate Site Boundary
- ★ Point Counts - Along activity transect
- Eastern Transect Route
- Western Transect Route

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Rev	Description	By	CB	Date
Drawing Number				Rev
ECO00312-ECO-001				-
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Client	SIMEC Atlantis Ltd.
Project	Uskmouth Power Station
Title	Figure 1. Bat Activity Survey Transect Route

Status	Drawn By	PM/Checked By
DRAFT	LW	TO
Project Number	Scale @ A3	Date Created
ECO 00312	1:4,500	NOV 2019

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Legend

- Approximate Site Boundary
- ▲ Static Bat Detectors
- Site Areas

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Rev	Description	By	CB	Date
Drawing Number				Rev
ECO00312-ECO-002				-

Client	SIMEC Atlantis Ltd.
Project	Uskmouth Power Station
Title	Figure 2. Static Bat Detector Locations Map

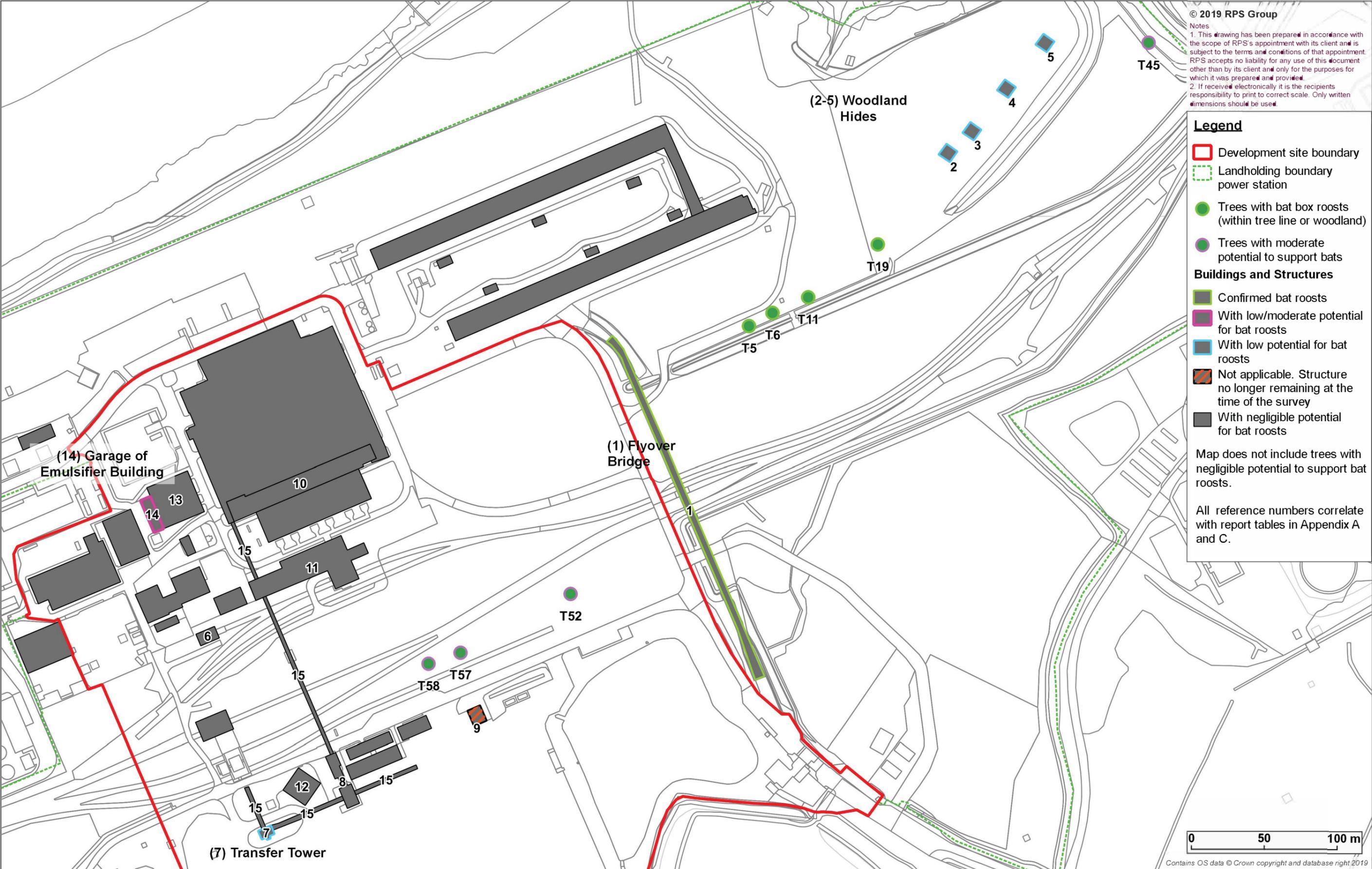
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Project Number	Scale @ A3	Date Created
ECO 00312	1:4,500	OCT 2019

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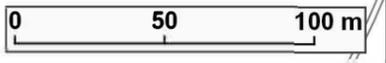
- Development site boundary
- Landholding boundary
- Trees with bat box roosts (within tree line or woodland)
- Trees with moderate potential to support bats

Buildings and Structures

- Confirmed bat roosts
- With low/moderate potential for bat roosts
- With low potential for bat roosts
- Not applicable. Structure no longer remaining at the time of the survey
- With negligible potential for bat roosts

Map does not include trees with negligible potential to support bat roosts.

All reference numbers correlate with report tables in Appendix A and C.



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1	-	-	-	-	-
Rev	Description	By	CB	Date	Rev
Drawing Number					ECO00312-ECO-003

Client	SIMEC Atlantis Ltd.
Project	Uskmouth Power Station
Title	Figure 3. Building and Tree Reference Map

Status	DRAFT	Drawn By	LW	PM/Checked By	TO
Project Number	ECO00312	Scale @ A3	1:2,363	Date Created	Jan 2020

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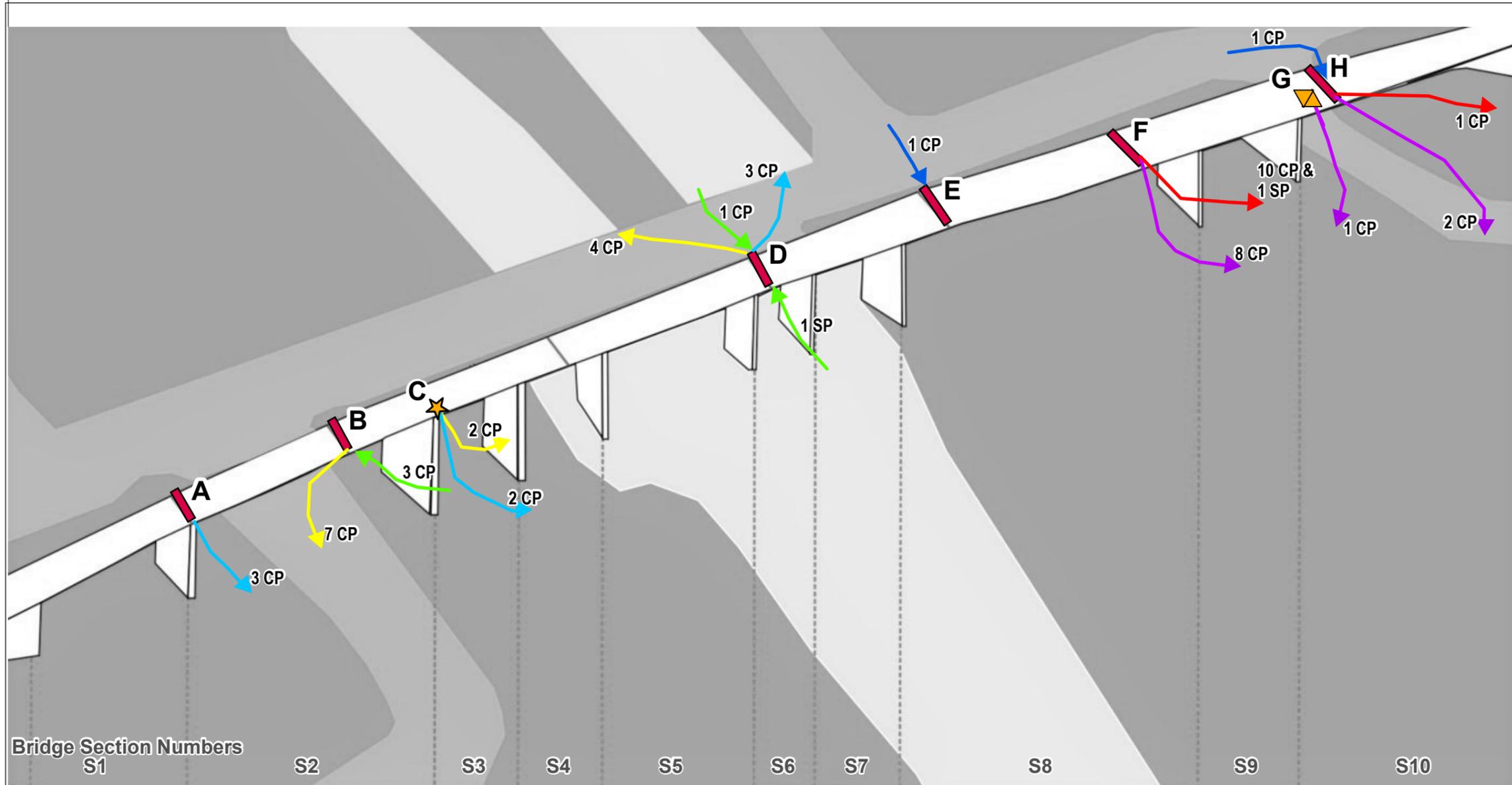
Legend

Survey Date

- 07/08/2019
- 21/08/2019
- 18/09/2019
- 20/08/2019
- 29/08/2019
- 17/09/2019

Roost Features (labelled A-H)

- ★ Gap between top of concrete support and underside of the bridge
- ▲ Gap in inset brickwork
- █ Expansion Gaps
- CP = Common Pipistrelle
- SP = Soprano Pipistrelle



Rev	Description	By	CB	Date
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Client SIMEC Atlantis Ltd.

Project Uskmouth Power Station

Title Figure 4. Bat Emergence Results
 – Flyover Bridge

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Legend

- Approximate Site Boundary
- Site Areas
- waterbodies

Foraging Activity

- Common and soprano pipistrelle
- Noctule
- Myotis species

Summarised Flight Paths

- ◆ Common and soprano pipistrelle
- ◆ Noctule

0 50 100m

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Rev	Description	By	CB	Date

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ECO00312-ECO-005	-

Client **SIMEC Atlantis Ltd.**

Project **Uskmouth Power Station**

Title **Figure 5. Activity Transect Results Summary**

Status DRAFT	Drawn By LW	PM/Checked By TO
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APPENDICIES

- **Appendix A.** Full descriptions of buildings from ground inspection.
- **Appendix B.** Photographs of buildings during ground inspections.
- **Appendix C.** Full results of aerial tree inspections.
- **Appendix D.** Summary of bat species recorded over five nights across static detector locations.

Appendix A

Full Building Descriptions from Ground Inspection

Building Name	Map Reference	Building and Main Features' Description	Plates (Appendix B)	Bat Roost Suitability
Flyover Bridge	1	<ul style="list-style-type: none"> The Flyover bridge is an elevated concrete roadway approximately 130m long spanning several reens and the on-site railway. The road is supported on prefabricated concrete supports up to 12m high. It is constructed of prefabricated interlocking sections. Between each section there are expansion gaps which are step shaped in profile, with downward facing openings on the bridge underside. Some of the gaps are capped at each end by a concrete plate, while others are open leaving horizontal facing openings in the sides of the bridge which would allow bats to enter the gap. There are horizontal gaps on either side of the top of each of the bridge supports, and also between the bridge underside and concrete abutment at each end. These gaps appear to span the width of the bridge and potentially conceal cavities. There are several additional openings on the underside of the bridge between concrete sections and where there has been corrosion of the concrete. 	1 - 3	High (Confirmed roost for soprano and common pipistrelle during emergence surveys)
Woodland Hide 1	2	<ul style="list-style-type: none"> Single storey derelict hut that is constructed with timber and plywood, with flat corrugated sheet metal roof. Not weatherproof. No evidence of bats. Negligible maternity roost potential. No suitable habitat for crevice dwelling bats. Low/ moderate potential for use as a feeding perch by free hanging bat species. 	4-5	Low
Woodland Hide 2	3	<ul style="list-style-type: none"> Two storey derelict hut that is constructed with timber, scaffold and plywood, with flat corrugated sheet metal roof. Reasonably weatherproof. Wooden sleeper internal floor. Inspection of ground floor and first floor. No evidence of bats. Likely active Wood pigeon nest on second floor ledge. Two warm eggs present. Negligible maternity roost potential. No suitable habitat for crevice dwelling bats. Low/ moderate potential for use as a feeding perch by free hanging bat species. 	4-5	Low
Woodland Hide 3	4	<ul style="list-style-type: none"> Two storey derelict hut that is constructed with timber, scaffold and plywood, with flat corrugated sheet metal roof. Reasonably weatherproof. Wooden sleeper internal floor. Inspection of ground floor and first floor. No evidence of bats. Evidence of nesting birds in 2019 - probable inactive Robin nest present. Negligible maternity roost potential. No suitable habitat for crevice dwelling bats. Low/ moderate potential for use as a feeding perch by free hanging bat species. 	4-5	Low
Woodland Hide 4	5	<ul style="list-style-type: none"> Two storey derelict hut that is constructed with timber, scaffold and plywood, with flat corrugated sheet metal roof. Poor state of repair and not weatherproof. Wooden sleeper internal floor. Inspection of ground floor and first floor. No evidence of bats. Evidence of nesting birds in 2019 - probable inactive wren nest present. Negligible maternity roost potential. No suitable habitat for crevice dwelling bats. Low/ moderate potential for use as a feeding perch by free hanging bat species. 	4-5	Low

REPORT

Building Name	Map Reference	Building and Main Features' Description	Plates (Appendix B)	Bat Roost Suitability
Rail Unloading Facility	6	<ul style="list-style-type: none"> A rectangular shed approximately 22m x 15m x 8m high (at roof apex). Constructed of corrugated metal (single skin) over a metal frame with a shallow pitched corrugated metal roof with Perspex roof lights. The shed is open at both ends to allow train access. Inside the shed is a Portakabin style office of solid metal panel construction with a flat roof. The basement level comprises a chamber beneath the railway into which coal is dropped and funnelled on to a subterranean conveyor. The shed is open at both ends and the single skin metal walls and roof have no cavities or potential roost features. The office building is of metal panel construction with no gaps or openings that could be used by roosting bats. The basement level was not accessible during the survey and it was not possible to determine its suitability to be used by roosting bats. In operation, conveyor noise and coal dust will have made the basement entirely unsuitable for bats. There were no bat droppings on the ground around the entrance in the Railway Unloading Facility which would be expected if bats were entering a roost in the basement level. 	6 - 8	Negligible / None.
Transfer Tower	7	<ul style="list-style-type: none"> A concrete building approximately 9m x 7m x 12m high with a flat roof and single glazed metal frame windows. The building houses plant which drives the conveyors entering the building on the north and east elevations. The building is largely in a good state of repair with no significant openings in the wall fabric. Where the conveyor housing joins the building approx. 6-8m up on the north and east elevations, the surrounding sheet metal is lifted approximately 5cm from the wall leaving a tapering gap approximately 20cm deep. There appears to be an opening in the underlying concrete which could open into a larger cavity. There are also some small gaps where a projecting metal housing joins the southern elevation at about 6m height. There is a broken window pane on the north elevation gives access to the interior. 	9 - 11	Low / Medium
Crusher Building	8	<ul style="list-style-type: none"> A small complex of adjoining buildings between approximately 3m and 10m high constructed of corrugated metal sheeting with a mix of shallow pitched corrugated metal, and flat roofs. The building has single glazed metal framed windows and several openings with concertina metal doors. Conveyors enter the building on the north east and west elevations. The building was in a good state of repair with the only openings into the interior being gaps in concertina doors. The building interior houses plant and is likely to be thermally unstable due to the metal construction. Consequently, it has very poor suitability for roosting bats. Small gaps were present between the metal window and door surrounds and the recesses in the corrugated metal walls, but these were dead ended. The smooth metal surface would also make it very difficult for bats to gain purchase. 	12	None/ Negligible.
Coal Reclaim Hopper	9	<ul style="list-style-type: none"> Subterranean structure accessed by a metal hatch. Not evident at indicated map location during the site visit. This structure was not evident during the site survey and could not be inspected. 	N/A	N/A
Bunker Hall	10	<ul style="list-style-type: none"> The Bunker Hall is part of the main coal power station building which also houses the boilers and turbines. A proposed conveyor feed to the new day silos and a feed to the mill from the day silos will adjoin the building. The part of the Bunker Hall into which the proposed feeds will enter is over 20m high and of red brick construction with single glazed metal framed windows and a flat concrete roof. 	13 - 14	None/ Negligible.

REPORT

Building Name	Map Reference	Building and Main Features' Description	Plates (Appendix B)	Bat Roost Suitability
		<ul style="list-style-type: none"> The southern elevation where one of the feeds would enter has lines of bleed gaps between bricks every 5-6m vertically with the gaps at approximately 1m intervals laterally. Several gaps were present southern elevation around 15-20m height where filler was missing from a seem in the brickwork. They seem was approximately 5m wide, but it was not possible to clearly see how deep the gap was due to the distance. Their height and exposure make them very unlikely to be used by roosting bats. A few gaps were also visible between bricks where mortar was missing although it was not possible to see the depth of the gap due to the height of the features. 		
Proposed Lime Silo Location	11	<ul style="list-style-type: none"> The proposed new Lime Silo will adjoin an existing structure which is part of a larger complex of corrugated metal buildings up to 20m high and housing plant servicing the main stack. The building onto which the proposed new lime silo would adjoin has single skin metal walls with no crevices or gaps. There are some openings into the building where the metal skin has rusted or com away around the ground level doors. However, the interior of the building being metal sheet walled is unlikely to have features which could be used by roosting bats. Large amounts of coal dust had accumulated on surfaces around the openings in the building and the interior will be significantly contaminated with thick dust on surfaces. This is likely to further deter bats from using the building. 	16	None/ Negligible.
Biomass Shed	12	<ul style="list-style-type: none"> The Biomass Shed measures approximately 18m x 18m x 8m high and comprises 2m high prefabricated concrete walls on three sides supporting an arched single skin of corrugated metal on a metal frame. The building is open at one end and currently store road salt and stockpiled materials. The single skin metal shell and solid concrete walls of the Biomass Shed do not contain gaps, crevices or larger void within which bats could roost. 	15	None/ Negligible.
Emulsifier / Fire pump House	13	<ul style="list-style-type: none"> The Emulsifier / Fire pump House is located west of the Bunker Hall and will adjoin the proposed new Day Silo. It is a single storey red brick building with a flat concrete roof and single glazed metal framed windows. The building has bene extended to the west with a small single storey garage extension (see below) of similar construction and with a small box eave. The Emulsifier / Fire Pump house was largely free of potential roost features. The interior was light due to large windows on the southern elevation, and the flat concrete roof did not appear to have a roof void. No openings or gaps were visible along the roof edge of the elevation where the new day silo will adjoin the building. No soffit presents. Roof seems to be concrete slab to the edge. No crevices to endoscope. 	17 - 18	Negligible
Garage of emulsifier building	14	<ul style="list-style-type: none"> Along part of the southern elevation there is a small box eave constructed of plastic / metal sheeting with a wooden soffit underside. The gap between the soffit and the wall was too narrow to allow bats to enter being less than 8mm wide along its length and with cobwebs over much of its length indicating it had not been used. No signs of use by bats were visible (such as droppings, polishing etc). In one location the gap between the vertical metal / plastic casing and the soffit was large enough to allow a bat access. The casing surface lacked grip which would make entering more difficult. 	17 - 18	

REPORT

Building Name	Map Reference	Building and Main Features' Description	Plates (Appendix B)	Bat Roost Suitability
		<p>South End:</p> <ul style="list-style-type: none"> Soffit/ barge board present. Building is single storey and of brick construct with flat metal sheeting roof and metal sheeting soffit. Suitable crevice present and inaccessible areas present due to angle of construction (endoscope unable to bend). Moderate bat roost potential. <p>North End:</p> <ul style="list-style-type: none"> Soffit/ barge board present (same as describe above for south end). Suitable crevice present. No bats present and no inaccessible areas. More exposed than south side. Low bat roost potential. 		Low/ Moderate
Conveyors	15	<ul style="list-style-type: none"> A system of conveyors runs from the Rail Unloading Facility through the Transfer Tower and the Crusher Building to the Bunker Hall and the Reclaim Hopper. Some conveyor sections are subterranean, while others are elevated on steel towers and enclosed in single skin corrugated metal housing. The elevated conveyors are likely to be thermally unstable due to their exposed positions and metal construction. The single skin construction makes it very unlikely there would be any enclosed cavities or voids in the structure. 	19 - 20	None/ Negligible.

Appendix B

Photographs from Building Inspection



Plate 1: Flyover Bridge



Plate 2: Flyover Bridge Expansion Gap



Plate 3: Flyover Bridge Opening Between Bridge Underside and Abutment (North End)



Plate 4: Shooting (Woodland) Hides in Shooting Range Woodland.

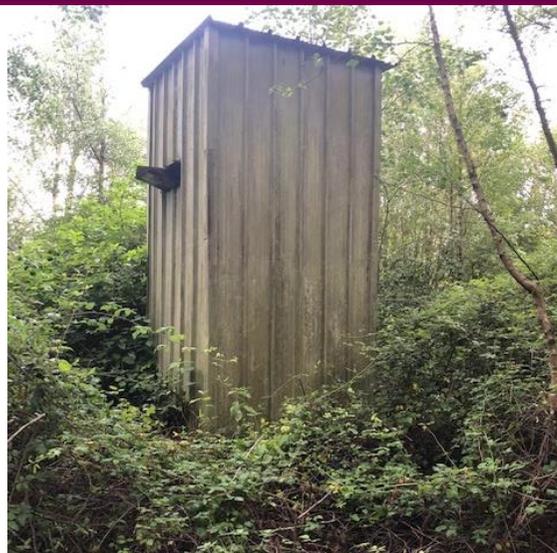


Plate 5: Shooting Hide in Shooting Range Woodland.



Plate 6: Rail Unloading Facility



Plate 7: Portakabin Office in Rail Unloading Facility



Plate 8: Rail Unloading Facility Looking into the Basement Level.



Plate 9: Transfer Tower



Plate 10: Gaps between Conveyor Enclosure and Transfer Tower



Plate 11: Gaps between Conveyor Enclosure and Transfer Tower



Plate 12: Crusher Building



Plate 13: Bunker Hall



Plate 14: Gaps in the Bunker Hall Brickwork



Plate 15: Biomass Shed



Plate 16: Existing building Adjoining Proposed Lime Silo Location



Plate 17: Emulsifier and Fire Pump House



Plate 18: Emulsifier and Fire Pump House Soffit.



Plate 19: Gaps between Conveyor Enclosure and Transfer Tower



Plate 20: Example of Enclosure where Conveyors Go Below Ground

Appendix C

Full results of aerial tree inspections

REPORT

RPS Initial Ground Assessment				Aerial Inspection with Endoscope Results		Bat Roost Status
Tree Reference	Species	Location	PRFs / Evidence of bats	Features found & examined		
T5	<i>Acer</i> sp.	Woodland	Three bat boxes, no other obvious PRFs.	All three bat boxes were inspected for signs of bats. The lowest box contained a single soprano pipistrelle and was left in situ. The middle box did not contain any evidence of use and was taken down. The highest box showed signs of recent use by bats (pipistrelle droppings) and was left in situ		Confirmed two pipistrelle species roosts.
T6	<i>Acer</i> sp.	Tree line	Three bat boxes, fused stems at base of trunk, crack on knot hole.	All three bat boxes were inspected for signs of bats. A single soprano pipistrelle was encountered in both the lowest and middle boxes whilst a brown long-eared bat was seen in the top box. All three boxes have been left in situ.		Confirmed two pipistrelle species roost and one brown long-eared bat roost.
T11	<i>Acer</i> sp.	Woodland edge	Two bat boxes, superficial pruning wound led nowhere.	Both bat boxes were inspected. One had evidence of recent use (pipistrelle droppings) and was left in situ; the second had no signs of use and was removed.		Confirmed one probable pipistrelle species roost.
T19	<i>Acer</i> sp.	Woodland edge	Three bat boxes, two wounds around the snapped/dead limbs.	All three bat boxes were inspected for signs of bats. The lowest box had bees within and was left in situ for safety reasons. The middle box was empty and was taken down. The highest box contained recent evidence of bats (pipistrelle droppings) and was left in situ.		Confirmed one probable pipistrelle species roost.
T2	Lombardy poplar <i>Populus nigra</i> var. <i>italica</i>	Tree line	Holes at top end of dead limb, all facing upwards and exposed to rain (N aspect)	Tree unsafe to climb.		Emergence survey conducted.
T32	<i>Alnus</i> sp.	Woodland	One hole, no other PRFs	The tree was accessed with ladders and inspected. The hole contained a 10 cm cavity that was dry inside. The access is slightly cluttered.		Low
T44	<i>Betula</i> sp.	Woodland	Ivy stem width of 5cm, creating crevice/crawl space	The tree was inspected from ground level. Thick-stemmed ivy was present that could have created some suitable cavities.		Low
T36	<i>Salix</i> sp.	Woodland	Branch with a few holes along the limb.	Tree inspected with endoscope from ground level. Small 10 cm cavity on northern aspect at 0.4 m. No signs of use and open at the top.		Low
T33	Dead tree	Woodland	Several holes, lifted bark with rotting and splits.	Tree inspected from ladders. The lower features are unsuitable. The heartwood has rotted away leaving a cavity that is open from above and affording limited protection.		Low

REPORT

Tree Reference	RPS Initial Ground Assessment			Aerial Inspection with Endoscope Results		Bat Roost Status
	Species	Location	PRFs / Evidence of bats	Features found & examined		
T34	<i>Salix</i> sp.	Woodland	Multiple stems from base, two dead limbs, one fallen limb, split beam (N aspect).	Tree accessed using ladders. A rot hole at 1 m on the northern aspect goes in 5 cm but is damp inside.		Low
T43B	<i>Salix</i> sp.	Woodland	Vertical split at 6 m on the northeast face.	Inspected from ground level using endoscope. Split has a suitable cavity but no signs of use.		Low
T40	<i>Betula</i> sp.	Woodland	Thin stem, multiple rot holes and obvious decay.	The observed cavities were very small; however, one large cavity was observed but was open from above and wet inside.		Low
T46	<i>Salix</i> sp.	Woodland	Tree split at base with shallow cavity, rot in limbs with holes and two superficial holes.	A narrow cavity (< 3 cm) on the south face - clean and dry inside but flight path slightly cluttered. A second cavity on the southern aspect projected 30 cm upwards. Again, slightly cluttered flight path.		Low
T52	<i>Salix</i> sp.	Small group	Three woodpecker holes (N/NE/E), three sections with split beams/limbs.	A large cavity was located internally within the trunk. The hole on the eastern aspect at 4 m contained a 10 cm cavity that was suitable and dry - no evidence of use though. The remaining holes did not contain sufficient cavities to afford shelter.		Moderate
T57	<i>Salix</i> sp.	Small group	Twisted/ split limb.	Tree climbing and inspected. A south facing hole at 3.5 m contained a cavity that was too small for the endoscope (2 cm x 2 cm). No droppings or oil staining seen. Rot holes in the northeast aspect at 5, 6 and 7.5 m did not contain cavities. A split limb on the northeast contained a 12 cm cavity that was dry and sheltered. No evidence of use but highly suitable. Rot hole, east facing at 4 m. No cavity.		Moderate
T59	Whitebeam <i>Sorbus aria</i>	Opposite G1.1 in corner of grassland	Rotten limb with cavity seen from ground.	Rotten limb with cavity, 4 m high and north facing. Cavity measures 30 cm in branch - no evidence of use but suitable.		Moderate
T45	<i>Salix</i> sp.	Woodland	Large hole leading up to cavity on two stems.	A south facing cavity at 1 m goes up 10 cm inside affording a clean and dry space. The flight path to the cavity was clear. No evidence recovered.		Moderate

Appendix D

Summary of Bat Species Recorded Over Five Nights Across Static Detector Locations

REPORT

Site Area	Location No.	Month	Serotine	<i>Myotis</i> species	Noctule/ Leisler's bat	Noctule	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe bat
Area A - Woodland Block	15	Apr 2019	0	5	0	599	0	661	92	1	1
	15	May 2019	0	4	7	265	0	912	125	6	10
	20	Jun 2019	0	1	3	131	0	36	17	3	0
	20	May 2019	6	0	3	83	0	76	28	4	1
	23*	Jul 2019	1	22	3	47	0	531	175	0	0
Area B – Laydown Area and Eastern Section of Rail Line	10	Oct 2018	0	3	0	2	0	22	2	0	0
	16	Apr 2019	0	2	10	55	0	70	10	1	1
	16	May 2019	3	5	17	48	0	117	19	1	3
	17	May 2019	0	1	0	145	0	26	5	0	0
	22	Jul 2019	0	1	6	217	0	309	50	0	0
Area C – Western Section of Rail Line & Managed Grassland	22	Jun 2019	29	2	92	321	0	187	50	1	0
	1	Aug 2018	0	0	0	31	0	48	8	0	0
	2	Aug 2018	0	2	0	19	0	1932	66	0	0
	18	May 2019	0	5	6	92	0	218	85	2	0
Area D - Coal Storage Area & Lamby's Lake	24	July 2019	2	3	24	206	0	454	128	0	0
	7	Sept 2018	0	157	2	14	5	188	158	3	0
Area E – Western section of power station site	14	Apr 2019	2	8	5	178	2	104	77	0	0
	4	Aug 2018	0	49	0	29	0	314	1660	12	0
Area G – Cooling Towers	6	Sept 2018	2	8	2	3	0	81	6	0	0
	9	Oct 2018	0	5	6	4	0	2	0	0	0
	13	Apr 2019	0	4	1	313	0	186	195	0	1
	19	Jun 2019	0	0	2	234	0	482	19	0	0
	19	May 2019	0	0	0	155	0	795	94	0	0
	21	Jul 2019	0	2	7	27	0	332	3	1	0
Area H – NW section of power station site	21	Jun 2019	0	2	2	336	1	281	0	0	0
	3	Aug 2018	1	3	0	40	0	67	15	0	0
	5	Sept 2018	9	4	9	30	1	157	28	0	0
	8	Oct 2018	16	0	16	0	0	15	0	0	0

*Static detector location number 23 only had recordings for two nights, not five.