

Skyline Ecology

Monckton Coke Works

Bat Emergence and Activity Survey

Draft

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Appendices

Appendix A Desk Study Information

1 Executive Summary

- 1.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121. The site comprises of a large area of predominantly bare ground where coke processing and storage would have taken place. Many of the buildings which were once been on site have been demolished leaving numerous piles of building rubble. Around the perimeter of the site are areas of developing woodland and scrub. A number of buildings remain on site which are associated with storage or former office/work usage. Other habitats noted within the site include water bodies and lagoons, marshy grassland, tall ruderals and semi-improved grassland.
- 1.1.2 SYBG provided a total of 71 bat records for the search area. The largest roost within the search area is for 57 bats located approximately 200 metres to the east of the study site. SBRC provided 140 records of bat within the search area. The majority of these are for Carlton Marsh LNR. WYBG provided eight records for the search area the closest of which is for a common pipistrelle maternity roost located approximately 750 metres south of the study site.
- 1.1.3 There are limited roosting opportunities for bats within the site. Only building 1 has any bat roosting potential. The site offers good foraging and commuting opportunities for bats, especially around the northern, southern and western boundaries.
- 1.1.4 The two emergence surveys undertaken on Building did not show any bats emerging. Bat activity was limited to a small number of noctule bats commuting and feeding towards the lagoons within the site.
- 1.1.5 The walked transect and static bat detector surveys found that bat activity within and around the site was considered to be low with only small pockets of regular activity identified during the transects. Most bat activity was recorded within the woodland to the north, or around the lagoons. A small amount of activity was recorded to the south, close to the water treatment works and along the western boundary.
- 1.1.6 Further enhancement of the site for bats should be undertaken. This enhancement should be concentrated within areas where there is currently some bat activity. Therefore, it is recommended that bat bricks are included within some of the properties which back onto the western and northern boundaries.
- 1.1.7 As the majority of bat foraging was recorded around the lagoons it is recommended that a wildlife pond is located within this area to maintain an open body of water on the site. The pond should be managed for nature conservation purposes and therefore should be included as part of a Landscape and Ecological Management Plan (LEMP).
- 1.1.8 To ensure that commuting routes are maintained and or enhanced, a planting scheme to include additional planting along the western boundary should be incorporated within the scheme, this will enhance this green corridor and will provide protection from light pollution onto the railway cutting, creating a dark corridor. In addition, shrub/hedgerow planting should also be incorporated along the northern boundary of the site, and where possible along the road boundary to the east.
- 1.1.9 The development has the potential to affect bats through lighting within the development, especially within the feeding area to the north of the site. A detailed lighting plan should be produced to consider bats within its design. This is to ensure that dark corridors through the site are either created or, in the case of the northern and western boundaries, maintained. Lights onto the woodland to the north of the site should be avoided where possible.

2 Introduction

2.1 Site Description

- 2.1.1 The site is a former coke works, located on Lund Hill Lane (B6428), to the east of Royston at ordnance survey grid reference SE 374121.

2.2 Description of Project and Background to Commission

- 2.2.1 This ecological report has been prepared by Skyline Ecology on behalf of the client. It is understood that the report is to form a planning application for the development of the site for residential housing.

2.3 Aims of Study

- 2.3.1 The objectives of the desk study and survey were as follows:
- Present evidence of, or any potential for, protected species supported by the site;
 - Set out the legislative and/or policy protection afforded to protected species associated with the site;
 - Present an assessment of any potential ecological impacts of development within the site based on the survey findings;
 - Provide recommendations for any further surveys if considered necessary; and
 - Provide recommendations on mitigation, compensation and/or enhancement measures that are likely to be required to ensure that the proposed development will be acceptable in planning terms and will comply with current wildlife legislation.
- 2.3.2 This report sets out the results of the survey and, in the context of any known ecological interest identified as a result of the desk study, sets out the approach necessary to ensure that effects on any identified ecologically sensitive receptors are avoided or ameliorated. This will ensure that the proposed development will be acceptable with reference to the planning and legal framework relating to ecological resources.

3 Methods

3.1 Desk Study

- 3.1.1 Existing ecological information for the site and its surrounding area was requested from the Sheffield Biological Records Centre (SBRC), West Yorkshire Ecology, South Yorkshire Bat Group (SYBG) and West Yorkshire Bat Group (WYBG). Information relating to bats was requested for the site and land up to 2 km from the site boundary. In addition, on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.defra.gov.uk/>) and aerial photography of the area were also reviewed.

3.2 Daytime Building Assessment

- 3.2.1 An assessment of the site's potential to support roosting bats was carried out by licenced bat ecologist Paul Howden-Leach MCIEEM on 5th November 2019, as part of the Phase 1 habitat survey, which should be read in conjunction with this report. A follow up survey was undertaken on the bridge structure on the 13th July 2020. Buildings and structures were inspected internally (where safe to do so) and externally for evidence indicating the presence of roosting bats or for features with the potential to provide bat roost habitats. Evidence indicating the presence of bats would normally include droppings, characteristic staining, scratch-marks or the presence of live or dead bats.
- 3.2.2 An assessment of structures not included within the accompanying Phase 1 Habitat Survey was undertaken within this report using the techniques mentioned above.

3.3 Evening Emergence Survey

- 3.3.1 An evening emergence survey was carried out on building 1, as per the recommendations within the accompanying Phase 1 habitat survey. The building was categorised as having low potential to support roosting bats, therefore under current guidance, one survey is required to establish if bats are using the building for roosting.
- 3.3.2 Evening emergence surveys commenced 15 minutes before sunset and finished no earlier than 90 minutes after sunset. All surveys were undertaken in appropriate weather conditions and these were recorded (see results located in Section 4). Any additional commuting or foraging activity recorded during the emergence survey was noted in order to understand how bats use the local habitat.
- 3.3.3 To cover all aspects of the building four ecologists would be required, however due to current restriction as a result of COVID-19, only two surveyors could be present during the survey, therefore the eastern and western aspects of the buildings were surveyed on two separate dates (Table 1).

Table 1: Start and finish times and weather conditions of emergence survey

Date	Temp	Weather conditions	Sunset/ Sunrise	Start	Finish
01/06/2020 (Dusk)	18°C Start 15°C End	Dry with 0% cloud cover and no wind (Beaufort 1).	21:26	21:10	22:45
16/06/2020 (Dusk)	17°C Start 15°C End	Dry with 100% cloud cover and no wind (Beaufort 1).	21:38	20:15	22:40

- 3.3.1 Licenced Bat Ecologists Paul Howden-Leach MCIEEM and Martin Derbyshire ACIEEM were equipped with bat detectors (EMTouch 2 Pro) for recording and downloading, with calls reviewed using Kaleidoscope Pro software to enable genus/species identification of any

emerging bats. In addition to this, two infrared cameras accompanied with EMTouch 2 Pro bat detectors were also used to cover all aspects of the building during the survey on the 1st June 2020.

3.4 Activity Surveys

- 3.4.1 Activity surveys are based on current guidance set out by the Bat Conservation Trust (2016). To estimate the survey effort required, an assessment has been made as to the sites suitability to support commuting or feeding bats based on landscape features within and around the study site. Table 1 below which has been taken directly from the Bat Conservation Trust (2016) guidance shows the level of survey effort required based on the sites suitability to support roosting bats.

Table 1: Recommended survey effort as set out by the Bat Conservation Trust (2016)

Survey type	Low suitability habitat for bats ^a	Moderate suitability habitat for bats	High suitability habitat for bats
Transect/spot count/timed search surveys	One survey visit ^b per season (spring – April/May, summer – June/July/August, autumn – September/October) ^c in appropriate weather conditions for bats Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone	One survey visit ^b per month (April to October) ^c in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.	Up to two survey visits ^b per month (April to October) ^c in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.
AND			
Automated/static bat detector surveys ^d	One location per transect, data to be collected on five consecutive nights per season (spring – April/May, summer – June/July/August, autumn – September/October) ^c in appropriate weather conditions for bats	Two locations per transect, data to be collected on five consecutive nights per month (April to October) ^c in appropriate weather conditions for bats	Three locations per transect, data to be collected on five consecutive nights per month (April to October) ^c in appropriate weather conditions for bats

- 3.4.2 Due to the sites connectivity with Local Wildlife Site (LWS) Rabbit Ings Country Park and the rail and canal corridor the site has been assessed as having moderate suitable habitat for bats.

Walked Transects

- 3.4.3 A total of four transect surveys have been carried out to date. Table 3 shows the start and end time of each survey and the weather conditions. Surveys consisted of trained ecologists walking a predefined route and noting down bat activity. A series of listening points were included within the route to monitor bat activity within specific locations. These listening stops were between 3 and 5 minutes in length. Echo meter Touch 2 Pro bat detectors were used in conjunction with an ipad mini and Garmin Glo GPS to accurately plot bat activity within the site.

Table 3: Start and finish times and weather conditions of transect survey

Date	Temp	Weather conditions	Sunset/ Sunrise	Start	Finish
06/04/2020 (Dusk)	14°C Start 11°C End	Dry with 0% cloud cover and light breeze (Beaufort 2).	19:53	19:40	21:51
18/05/2020 (Dusk)	15°C Start 12°C End	Dry with 80% cloud cover and light breeze (Beaufort 2).	21:06	20:49	22:55

Date	Temp	Weather conditions	Sunset/ Sunrise	Start	Finish
08/06/2020 (Dusk)	13°C Start 10C End	Dry with 100% cloud cover and light breeze (Beaufort 2).	21:30	21:15	22:33
13/07/2020 (Dusk)	18.5°C Start 15°C End	Dry with 90% cloud cover and light breeze (Beaufort 3).	21:29	23:27	22:45

Automated Surveys

- 3.4.4 Automated remote detector surveys have been designed to follow the (2016) Bat Conservation Trust Guidance. Two full spectrum SM4 bat detectors were situated within the site for a minimum of five nights per month from April to July (inclusive). The detectors were moved to different locations each month to maximise coverage of the site and to gain an understanding of differing bat activity within different habitat features. Figure 9 located in Section 8 of this report shows the location of each static detector and the date of installation. Detectors were programmed to begin recording 30 minutes before sunset to 30 minutes after sunrise.
- 3.4.5 Data gathered from the detectors was manually identified using Kaleidoscope Pro software.

3.5 Limitations to Methods

- 3.5.1 Under current BCT Good Practice Guidelines (2016), sites which have been categorised as having moderate potential for roosting bats require activity surveys to be undertaken from April to September/October inclusive. To date only four of these surveys have taken place (April to July inclusive). it is not believed that this constraint is significant due to the low levels of activity recorded during all of the surveys and the consistency of the survey results. In addition, surveys in August and September will still be undertaken and if necessary amendments made to this report.

4 Results and Interpretation

- 4.1.1 This section sets out the findings of the desk study and survey work. Whilst every effort was made to provide a comprehensive description of the site during the field survey, no investigation can provide a complete assessment as the natural environment is difficult to predict and can therefore be subject to potential change.
- 4.1.2 The results of the surveys should be read in conjunction with the figures and data located in Section 8 and Appendix A of this report.

4.2 Data search

- 4.2.1 SYBG provided a total of 71 bat records for the search area. A large proportion of these are for records associated with Carlton Marsh and were for Pipistrelle species *Pipistrellus* Sp. and noctule bats *Nyctalus noctule*. The largest roost within the search area is for 57 bats located approximately 200 metres to the east of the study site. Species recorded within the search area include Leisler's bat *Nyctalus leisleri*, common pipistrelle bat *Pipistrellus pipistrellus*, Whiskered/Brant's bat *Myotis mystacinus/brandti*, Daubenton's bat *Myotis daubentonii* and brown long-eared bat *Plecotus auritus*.
- 4.2.2 SBRC provided 140 records of bat within the search area. The majority of these are for Carlton Marsh LNR located approximately 1.5km to the south of the site, Rabbit Ing's Country Park located 150 metres to the east of the site and Cudworth, approximately 240 metres to the east. A number of roosts were recorded within the search area. Only three roosts were recorded by SBRC, the closest of which is for a single unknown bat species 600 metres to the west of the study site.
- 4.2.3 West Yorkshire Bat Group (WYBG) provided eight records for the search area the closest of which is for a common pipistrelle maternity roost located approximately 750 metres south of the study site. Only *Pipistrellus* and other Vespertilionidae species were identified within the data search.

4.3 Daytime Survey

- 4.3.1 During the Phase 1 habitat survey each building on site was assessed for its potential to support roosting bats. A full internal and external assessment was carried out where access allowed. The accompanying Phase 1 habitat survey report gives full details on the potential for the building to support roosting bats. Figure 2 located in Section 8.2 of this report shows the location of each of the buildings as well as the bridge which has been assessed as part of this survey, and is described below.
- 4.3.2 Only structures which were not included within the original daytime bat survey as part of the Phase 1 habitat Survey have been included in this section

Road bridge

- 4.3.3 A concrete and brick road bridge located on the north eastern part of the site (Image 1). The bridge splits the site with Rabbit Ings Country Park and has been assessed as a precautionary measure. The masonry on the east and west sides of the bridge appear to be in good order, with no obvious cracks or gaps (Image 1).
- 4.3.4 Beneath the bridge the deck is well sealed with no gaps or cavities suitable for roosting bats (Image 2).
- 4.3.5 The bridge has two spans with a single central pillar. Between the ends of the pillars and the bridge deck are a number of cavities. All of these cavities were either filled with cobwebs (Image 3) or were very wet at the time of survey (Image 4), making these features unsuitable for roosting bats.

Image 1: Road bridge



Image 2: Underside of bridge deck



Image 3: Cobwebs in cavities of bridge



Image 4: Water running from cavities beneath the bridge piers



4.4 Evening Emergence survey

- 4.4.1 This section should be read in conjunction with Figures 2 and 3 located in Section 8 of this report.

Building 1

- 4.4.2 Building 1 was identified during the phase 1 habitat survey as having low potential to support roosting bats (Image 5). Features identified were areas of roofing felt located on the southern and western aspects of the building which had lifted slightly giving some limited potential for small numbers of summer roosting bats (Image 6).

Evening emergence survey – 1st June 2020

- 4.4.3 The single survey undertaken on the western, southern and northern aspect off the building did not show any bats emerging. Bat activity was limited to a small number of noctule bats commuting through the northern part of the site. Other species recorded during this survey were common pipistrelle bats. The results of the survey indicate that these aspects of the building are not currently being used by roosting bats.

Evening emergence survey – 16th June 2020

- 4.4.4 The single survey undertaken on the eastern and northern aspect of the building did not show any bats emerging. Bat activity was limited to a small number of noctule bats commuting and

feeding towards the lagoons within the site. Other species recorded during this survey were common pipistrelle bats. The results of the survey indicate that these aspects of the building are not currently being used by roosting bats.

Image 5: Building 1



Image 6: Lifted felt on western side of Building 1



4.5 Transect Survey Results

- 4.5.1 This section should be read in conjunction with Figures 4 to 8 located in Section 8 of this report.
- 4.5.2 In general, bat activity within and around the site was considered to be low with only small pockets of regular activity identified during the transects
- 4.5.3 Common pipistrelle and noctule bats accounted for the majority of bats recorded on site. Within the part of the site which is proposed for housing there was little bat activity recorded. Most bat activity was recorded within the woodland to the north, or around the lagoons. A small amount of activity was recorded to the south, close to the water treatment works and along the western boundary. Other areas of interest were the northern boundary, and to the east of the site within Rabbit Ings Country Park, again outside of the study site.
- 4.5.4 A summary of the data from the transect surveys is provided in Table 4 below.

Table 4: Summary of transect surveys

Survey details	Summary of bat activity
06/04/2020 Start: 19:45 Finish: 21:51 Sunset: 19:53	Activity from one species: Common pipistrelle: <ul style="list-style-type: none"> • First bat recorded 20:17, 24 minutes after sunset. • Seven bat passes recorded for the entire transect length. • Activity recorded within the woodland to the north of the site and around the lagoon where a single bat was recorded feeding. • Further activity was recorded around the water treatment works to the south.
18/05/2020 Start: 20:49 Finish: 22:55 Sunset: 21:06	Activity from three species: Common pipistrelle: <ul style="list-style-type: none"> • First bat recorded 21:39, 33 minutes after sunset. • Five bat passes recorded for the entire transect length.

	<ul style="list-style-type: none"> Activity recorded on the western and northern boundaries (single pass only) and along the railway cutting to the south of the site. <p>Noctule bat:</p> <ul style="list-style-type: none"> First bat recorded 21:18, 12 minutes after sunset. 20 bat passes recorded not including repeated feeding over the lagoons for three minutes. The majority of activity was recorded within the southern part of the woodland to the north of the site and over the lagoons. <p>Daubenton's Bat:</p> <ul style="list-style-type: none"> First bat recorded 22:17, 1 hour and 11 minutes after sunset. Only two bat passes recorded, commuting outside of the northern boundary of the site.
<p>08/06/2020</p> <p>Start: 21:15 Finish: 23:33</p> <p>Sunset: 21:30</p>	<p>Activity from three species:</p> <p>Common pipistrelle:</p> <ul style="list-style-type: none"> First bat recorded 22:02, 32 minutes after sunset. Three bat passes recorded for the entire transect length. Activity recorded around the lagoons only. <p>Noctule bat:</p> <ul style="list-style-type: none"> First bat recorded 21:47, 17 minutes after sunset. Four bat passes recorded for the entire transect length. Only activity recorded was over Rabbit Ings Country Park and towards the lagoon. <p>Leisler's Bat:</p> <ul style="list-style-type: none"> Only bat recorded 22:41, 1 hour and 11 minutes after sunset. Bat pass recorded close to the lagoons.
<p>13/07/2020</p> <p>Start: 21:14 Finish: 23:17</p> <p>Sunset: 21:29</p>	<p>Activity from three species:</p> <p>Common pipistrelle:</p> <ul style="list-style-type: none"> First bat recorded 21:58, 29 minutes after sunset. Five bat passes recorded for the entire transect length. Activity recorded around the lagoons and along the northern boundary. <p>Noctule bat:</p> <ul style="list-style-type: none"> First bat recorded 21:21, 52 minutes after sunset. Four bat passes recorded for the entire transect length. This does not include repeated feeding throughout two stopping points, where noctule bats were recorded feeding constantly over Rabbit Ings Country Park. <p>Daubenton's Bat:</p> <ul style="list-style-type: none"> Only bat recorded 22:44, 1 hour and 14 minutes after sunset. Three bat passes recorded commuting outside of the northern boundary.

4.6 Static bat detectors

- 4.6.1 Figure 9 located in Section 8 shows the location of each static bat detector. Figures 10 to 13 show the activity levels for each location. Table 4 shows the total and average number of calls recorded on each detector as well as the average number of calls recorded per species and detector per night.
- 4.6.2 The results of the static detectors confirm the findings during the transect surveys which is that the majority of bat activity is located to the north of the site, towards the lagoon and woodland strip. In general bat activity recorded on all static detectors was low, with the majority of bat detectors only recording between 15 and 53 passes per night on average. Only one bat detector recorded a more significant number of bats. This recorder (detector 1 – July), was located within the southern part of the strip of woodland to the north, and is where the majority

of bat passes were recorded during the transect surveys. This detector recorded an average of 135 bat passes per night.

Table 4: Total and average call from static detectors per month

Detector Number	April		May		June		July		Aug.		Sept.		Species Total	Av. Call per night
	1	2	1	2	1	2	1	2	1	2	1	2		
Common Pipistrelle	88	171	73	100	75	133	541	128					1309	23
Soprano Pipistrelle	44	6	4	24	2	17	350	0					407	7
Noctule	11	5	230	127	23	111	25	18					550	10
<i>Myotis</i> bat species	7	0	4	46	0	29	24	4					114	2
Brown long eared bat	2	1	2	2	0	2	1	4					14	0.2
Leisler's bat	26	8	7	11	13	11	2	2					80	1
Nathusius Pipistrelle	0	0	0	0	0	2	0	0					2	0.03
Total	138	191	320	310	113	305	943	156					2476	43
Av. call per night	15	21	53	52	16	44	135	22					43	

4.7 Interpretation of results

- 4.7.1 The majority of the site does not appear to be a significant resource for either commuting or foraging bats. The main areas of bat interest appears to be along the western and northern boundaries of the site and around the lagoons and woodland to the north.

5 Legislation and Impacts

5.1 Bats

5.1.1 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2012. Taken together, these make it an offence to:

- a) Deliberately capture, injure or kill a bat;
- b) Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- c) To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- d) Damage or destroy a breeding site or resting place of a bat;
- e) Intentionally or recklessly obstruct access to any place that bat uses for shelter or protection;
- f) Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.

5.1.2 A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

5.1.3 Seven bat species are listed in the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the NERC Act 2006.

5.1.4 No buildings or structure have been identified as containing roosting bats therefore demolition of these structures will not cause an offence under the legislation highlighted above.

5.1.5 Habitats associated with commuting and feeding bats may be affected which may result in an offence being caused under the legislation highlighted above.

6 Impacts and Recommendations

6.1 Roosts

- 6.1.1 Currently the site has very few roosting opportunities for bats. Both the bridge and building 1 do not contain roosting bats.
- 6.1.2 Further enhancement of the site for bats should be undertaken. This enhancement should be concentrated within areas where there is currently some bat activity. This activity is limited to the northern boundary of the site however there are also excellent commuting opportunities for bats along the western boundary. Therefore, it is recommended that bat bricks are included within some of the properties which back onto these boundaries.

6.2 Commuting and foraging

- 6.2.1 The majority of commuting and foraging was recorded outside of the study site, with bats using the northern boundary and woodland area to the north of the site.
- 6.2.2 The only part of the site which was recorded as being used on a regular basis by foraging and commuting bats was the pond/lagoon area where three species (noctule, common pipistrelle and Daubenton's bat) were recorded using these features as a feeding resource. As this part of the site will form an area of open space it is recommended that a wildlife pond is located within this area to maintain an open body of water on the site. The pond should be managed for nature conservation purposes and therefore should be included as part of a Landscape and Ecological Management Plan (LEMP).
- 6.2.3 To ensure that commuting routes are maintained and or enhanced, a planting scheme to include additional planting along the western boundary should be incorporated within the scheme, this will enhance this green corridor and will provide protection from light pollution onto the railway cutting, creating a dark corridor. In addition, shrub/hedgerow planting should also be incorporated along the northern boundary of the site, and where possible along the road boundary to the east.
- 6.2.4 The development has the potential to affect bats through lighting within the development, especially within the feeding area to the north of the site. Although bat activity is low within the site, additional lighting may discourage bats further. A detailed lighting plan should be produced to consider bats within its design. This is to ensure that dark corridors through the site are either created or, in the case of the northern and western boundaries, maintained. Lights onto the woodland to the north of the site should be avoided where possible.

7 References

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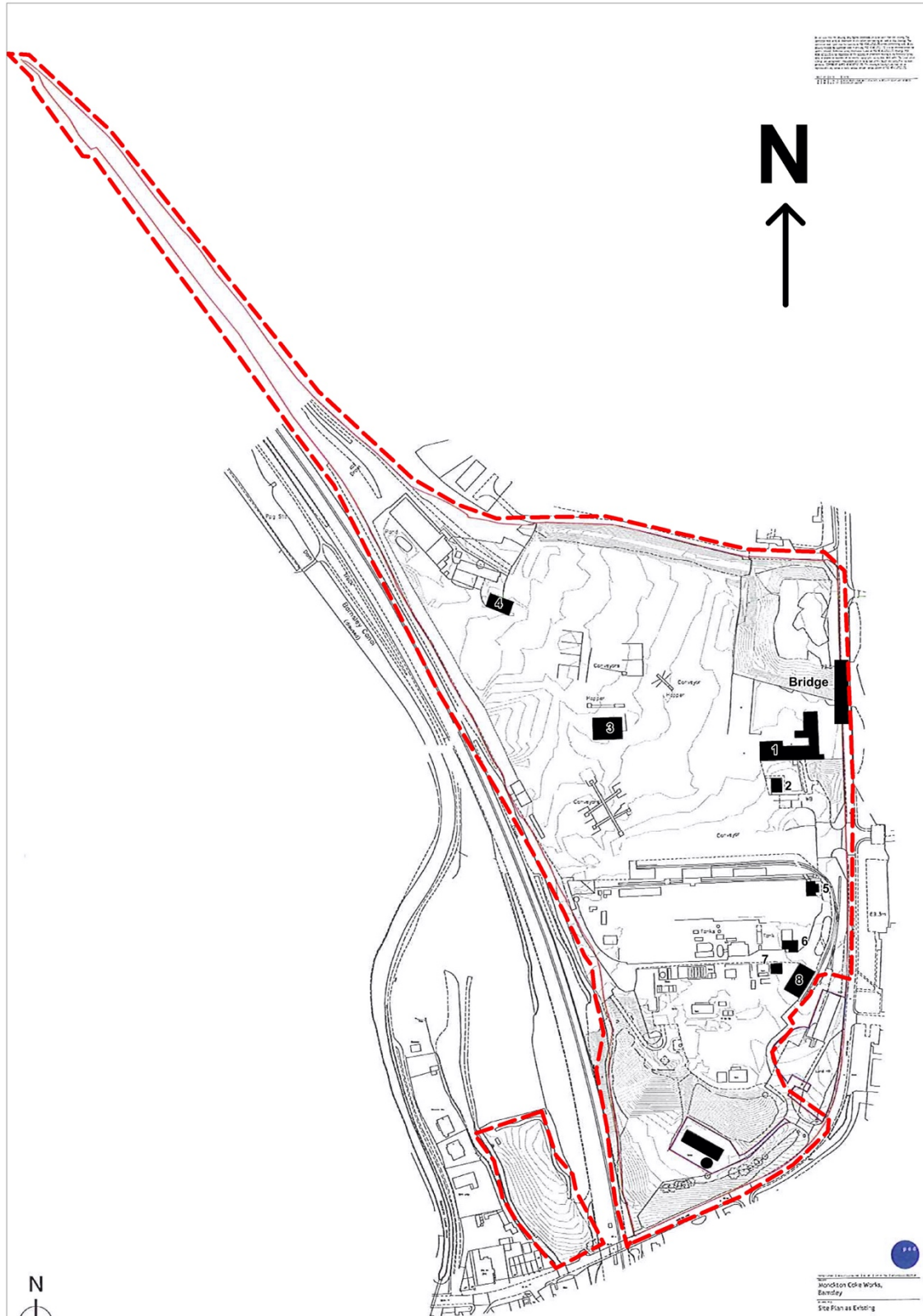
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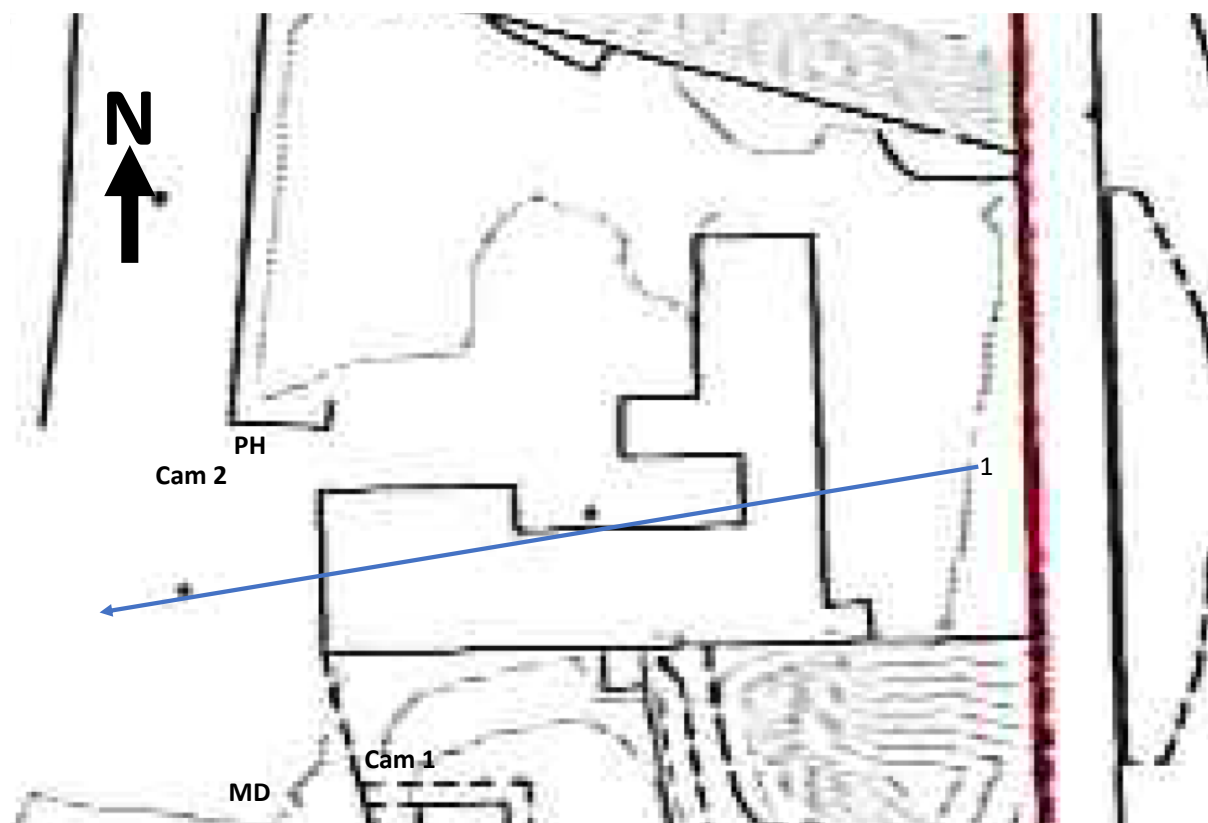
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8 Figures

8.1 Figure 1: Building Numbers



8.2 Figure 2: Evening Emergence Survey Results 1st June 2020



Paul Howden-Leach (PH) Results

Ref:	Species	Time	Notes
	NYCNOC	21:43	Faint call only
1	NYCNOC	22:00	Call only
	NYCNOC	22:10	Call only
	NYCNOC	22:11	Call only

Martin Derbyshire (MD) Results

Ref:	Species	Time	Notes
	NYCNOC	21:34	Faint call only
	NYCNOC	21:44	Call only
	NYCNOC	22:00	Call only
	NYCNOC	22:11	Call only

8.3 Figure 3: Evening Emergence Survey Results 16th June 2020



Paul Howden-Leach (PH) Results

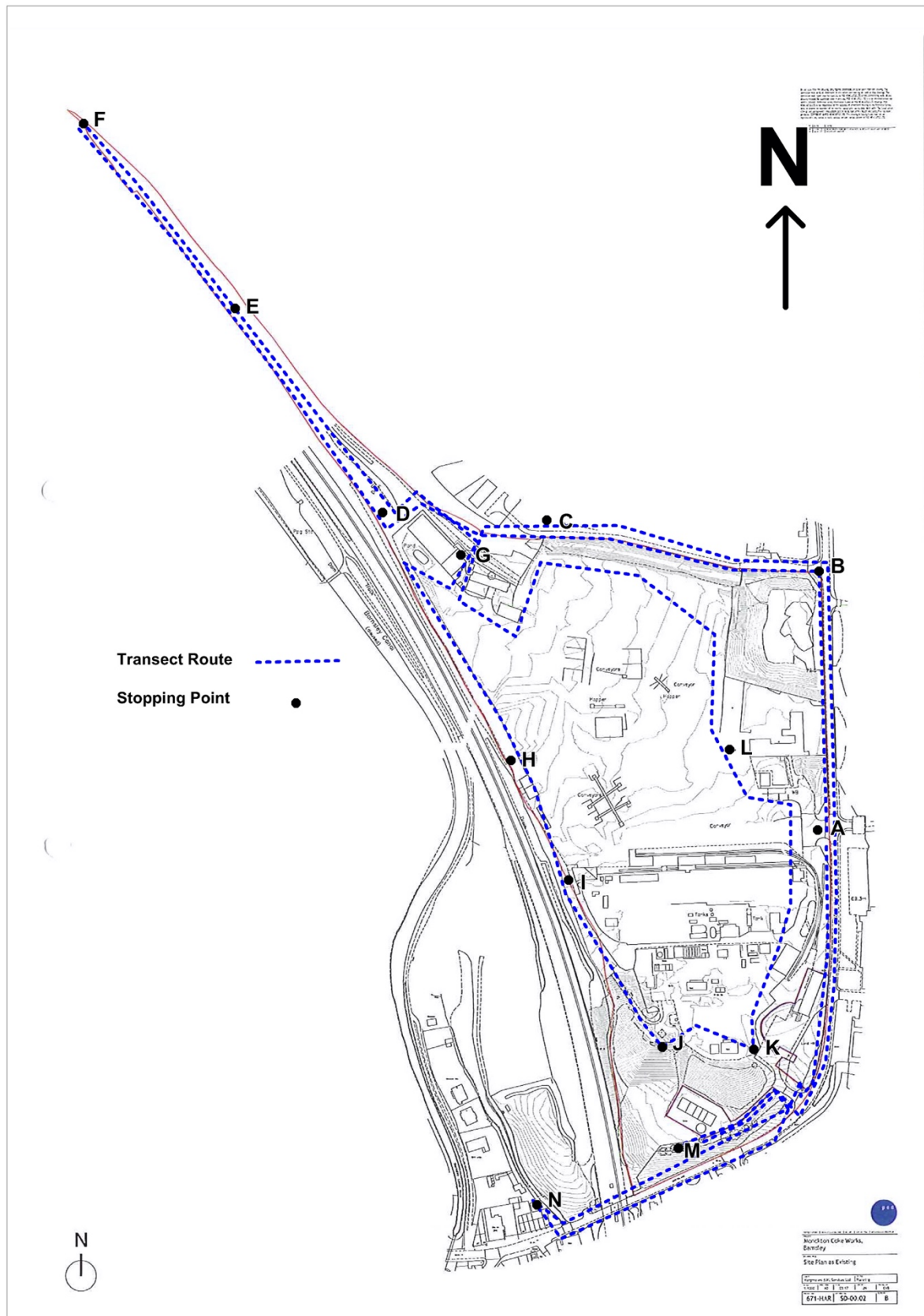
Ref:	Species	Time	Notes
1	NYCNOC	21:43	Commute
2	NYCNOC	21:44	Repeated feed for 2 minutes
	NYCNOC	21:50	Call only
	NYCNOC	21:55	Call only
1	NYCNOC	22:01	Commute
	NYCNOC	22:09	Call only
	NYCNOC	22:16	Call only
	NYCNOC	22:18	Call only
	NYCNOC	22:21	Call only
	NYCNOC	22:24	Call only
	PIPPIP	22:28	Call only

Martin Derbyshire (MD) Results

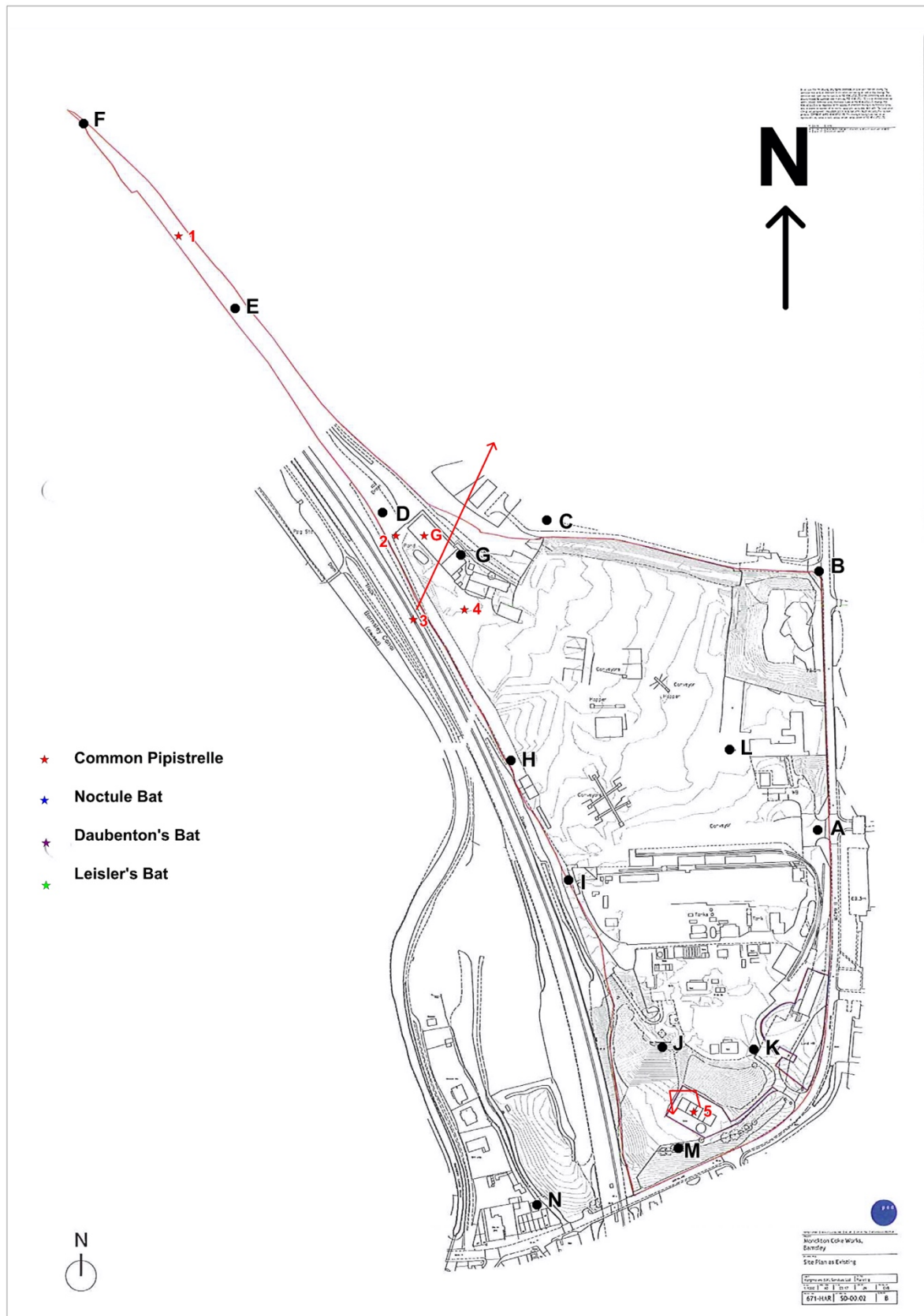
Ref:	Species	Time	Notes
1	NYCNOC	21:43	Commute
	NYCNOC	21:44	Call only
3	NYCNOC	21:45	Foraging
	NYCNOC	21:50	Call only
	NYCNOC	21:51	Call only
	NYCNOC	21:55	Call only
4	NYCNOC	22:01	Commute
	NYCNOC	22:09	Call only

Ref:	Species	Time	Notes
	NYCNOC	22:15	Call only
5	PIPPIP	22:17	Commute along bridge
	NYCNOC	22:21	Call only
	NYCNOC	22:22	Call only
	NYCNOC	22:24	Call only
	PIPPIP	22:27	Call only

8.4 Figure 4: Transect Route



8.5 Figure 5: April Transect Results

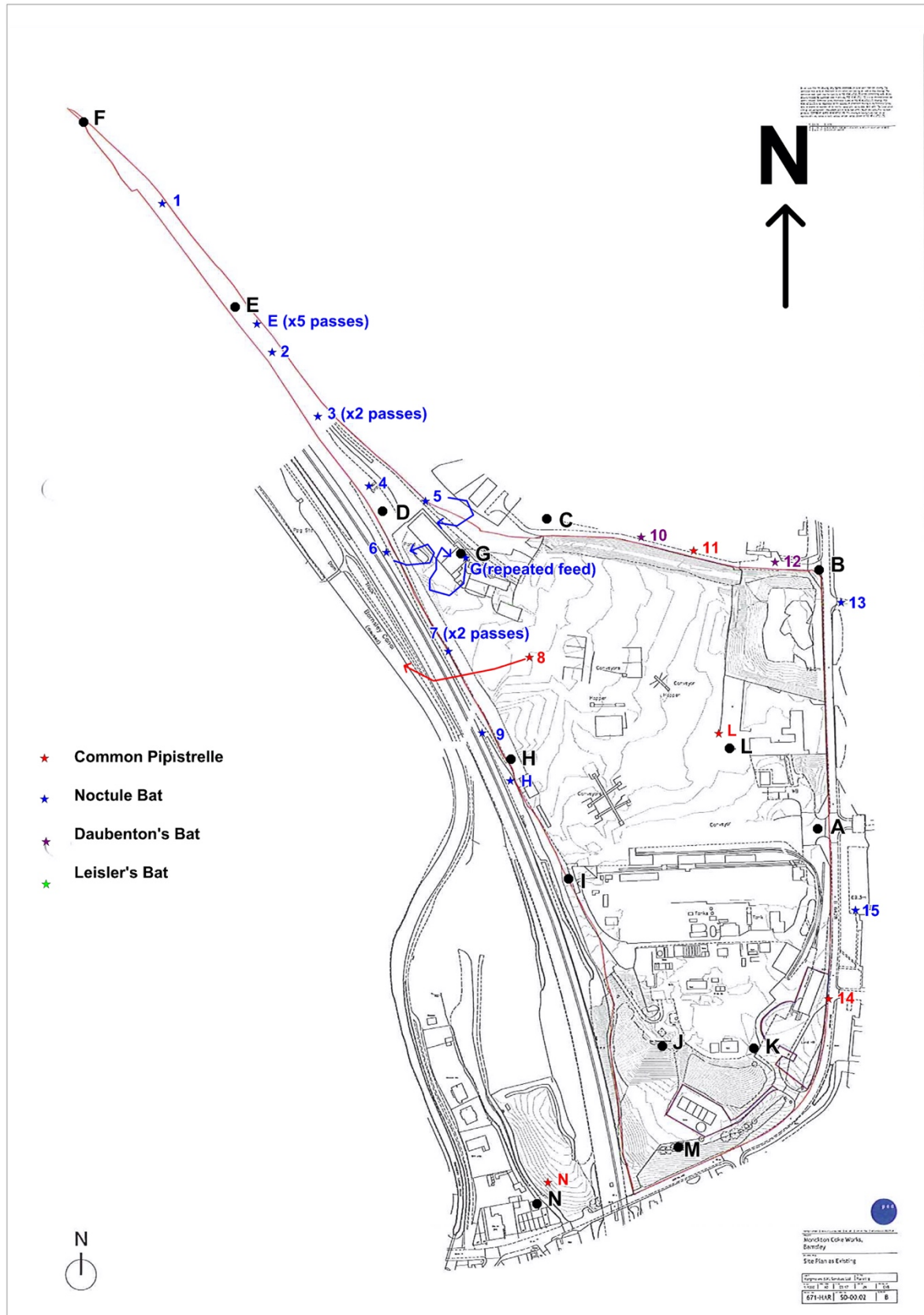


April Transect results

Ref:	Species	Time	Notes
A	Start	19:40	
B	Stopping point	19:45	3 minutes
C	Stopping point	20:00	3 minutes
F	Stopping point	20:10	3 minutes
1	PIPPIP	20:17	Call only
2	PIPPIP	20:18	Call only
3	PIPPIP	20:21	Commute
G	Stopping point	20:22	3 minutes
G	PIPPIP	20:23	Call only
G	PIPPIP	20:23	Forage around lagoon
4	PIPPIP	20:25	Call only
H	Stopping point	20:29	3 minutes
I	Stopping point	20:36	3 minutes
J	Stopping point	20:44	3 minutes
K	Stopping point	20:51	3 minutes
A	Stopping point	20:57	3 minutes
L	Stopping point	21:00	3 minutes
5	PIPPIP	21:14	Repeated feed
M	Stopping point	21:15	3 minutes
N	Stopping point	21:23	3 minutes
A	Stopping point	21:47	3 minutes
	Finish	21:51	

Key: PIPPIP – Common pipistrelle,

8.6 Figure 6: May Transect Results

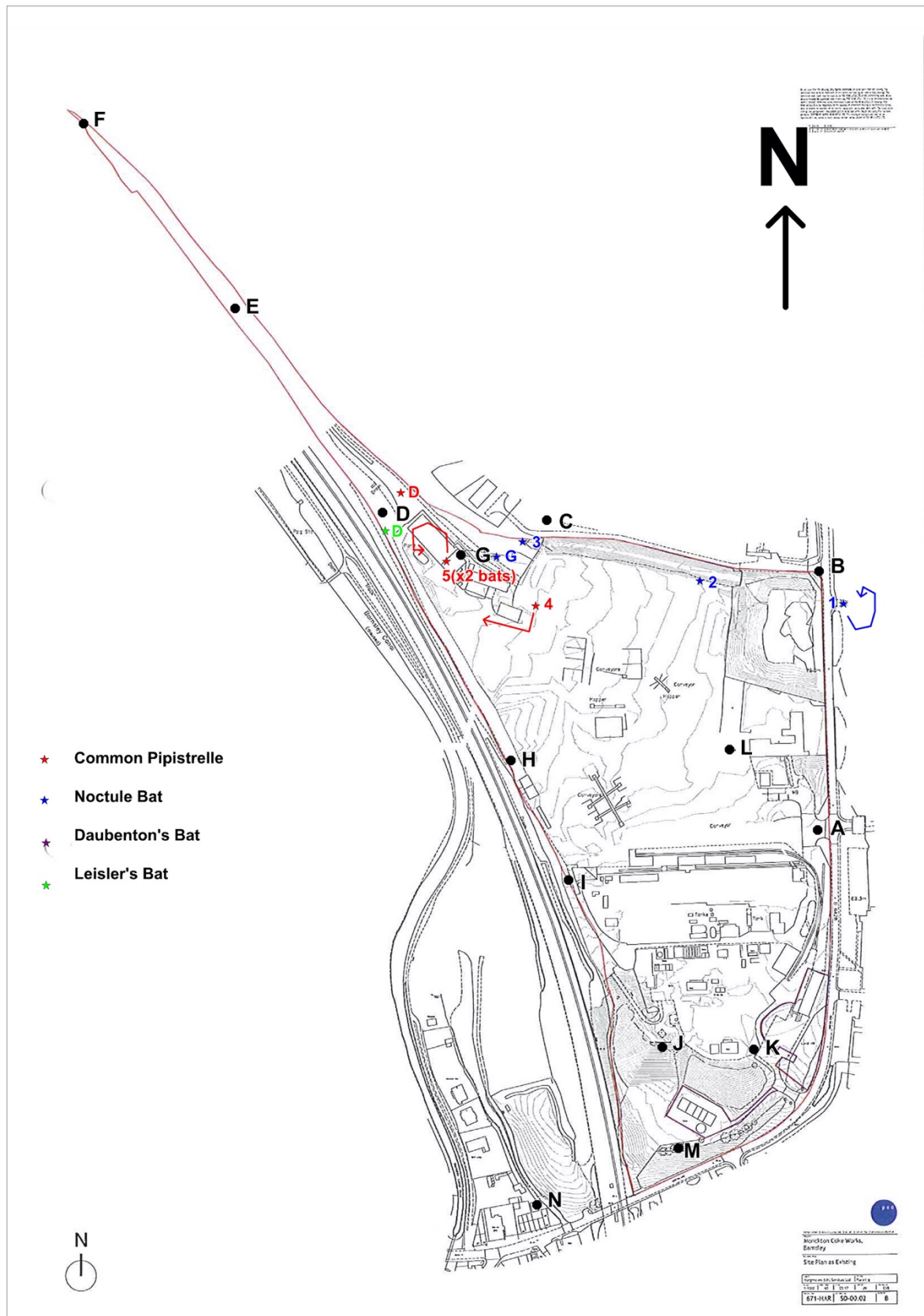


May Transect results

Ref:	Species	Time	Notes
A	Start	19:49	
A	Start	19:49	3 minutes
B	Stopping point	20:57	3 minutes
D	Stopping point	21:05	3 minutes
F	Stopping point	21:15	3 minutes
1	NYCNOC	20:18	Call only
E	Stopping point	21:22	3 minutes
E	NYCNOC	21:23	Call only
E	NYCNOC	21:24	Call only
E	NYCNOC	21:25	Call only
E	NYCNOC	21:25	Call only
E	NYCNOC	21:25	Call only
2	NYCNOC	21:26	Commute
3	NYCNOC	21:27	Call only
3	NYCNOC	21:28	Call only
4	NYCNOC	21:29	Call only
5	NYCNOC	21:30	Call only
5	NYCNOC	21:31	X2 bats repeated feed
6	NYCNOC	21:32	X2 bats repeated feed
G	Stopping point	21:33	3 minutes
G	NYCNOC	21:33	Repeated feed over pond for duration of 3 minute stop
7	NYCNOC	21:39	Foraging
8	PIPPIP	21:39	Commute
7	NYCNOC	21:40	Repeated feed
9	NYCNOC	21:41	Call only
H	Stopping point	21:43	3 minutes
H	NYCNOC	21:44	Call only
I	Stopping point	21:50	3 minutes
J	Stopping point	21:56	3 minutes
L	Stopping point	22:05	3 minutes
L	PIPPIP	22:06	Faint call
A	Stopping point	20:57	3 minutes
L	Stopping point	21:00	3 minutes
5	PIPPIP	21:14	Repeated feed
10	MYODAU	22:17	Call only
11	PIPPIP	22:18	Call only
12	MYODAU	22:21	Call only
13	NYCNOC	22:23	Foraging
A	Stopping point	22:25	3 minutes
14	PIPPIP	22:33	Call only
M	Stopping point	22:38	3 minutes
N	Stopping point	22:46	3 minutes
N	PIPPIP	22:57	Call only
15	NYCNOC	22:50	Call only
	Finish	22:55	

Key: PIPPIP – Common pipistrelle, NYCNOC – Noctule Bat, MYODAU – Daubenton's bat

8.7 Figure 7: June Transect Results

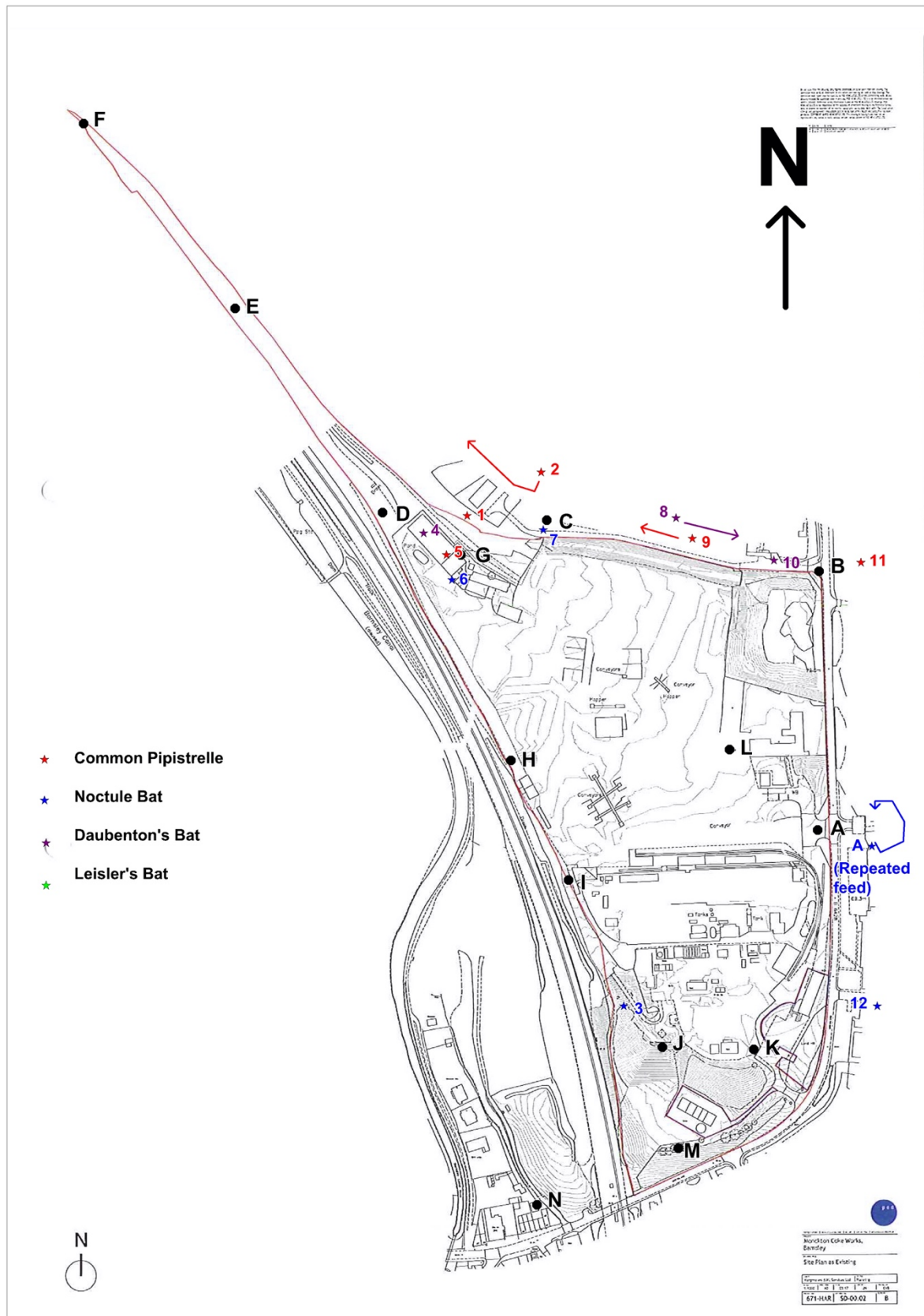


June Transect results

Ref:	Species	Time	Notes
A	Start	21:15	
A	Stopping point	21:15	3 minutes
N	Stopping point	21:23	3 minutes
M	Stopping point	21:31	3 minutes
A	Stopping point	21:41	3 minutes
1	NYCNOC	21:47	Forage
B	Stopping point	21:49	3 minutes
2	NYCNOC	21:53	Foraging
3	NYCNOC	21:56	Call only
G	Stopping point	21:58	3 minutes
G	NYCNOC	22:00	Call only
4	PIPPIP	22:02	Commute
L	Stopping point	22:06	3 minutes
K	Stopping point	22:17	3 minutes
J	Stopping point	22:27	3 minutes
H	Stopping point	22:31	3 minutes
5	PIPPIP	22:37	Feeding
5	PIPPIP	22:39	X2 bats feeding over pond
D	Stopping point	22:41	3 minutes
D	NYCLEI	22:41	Call only
E	Stopping point	22:48	3 minutes
F	Stopping point	22:56	3 minutes
D	Stopping point	23:07	3 minutes
D	PIPPIP	23:09	Call only
	Finish	23:33	

Key: PIPPIP – Common pipistrelle, NYCNOC – Noctule Bat, NYCLEI – Leisler's bat

8.8 Figure 8: July Transect Results

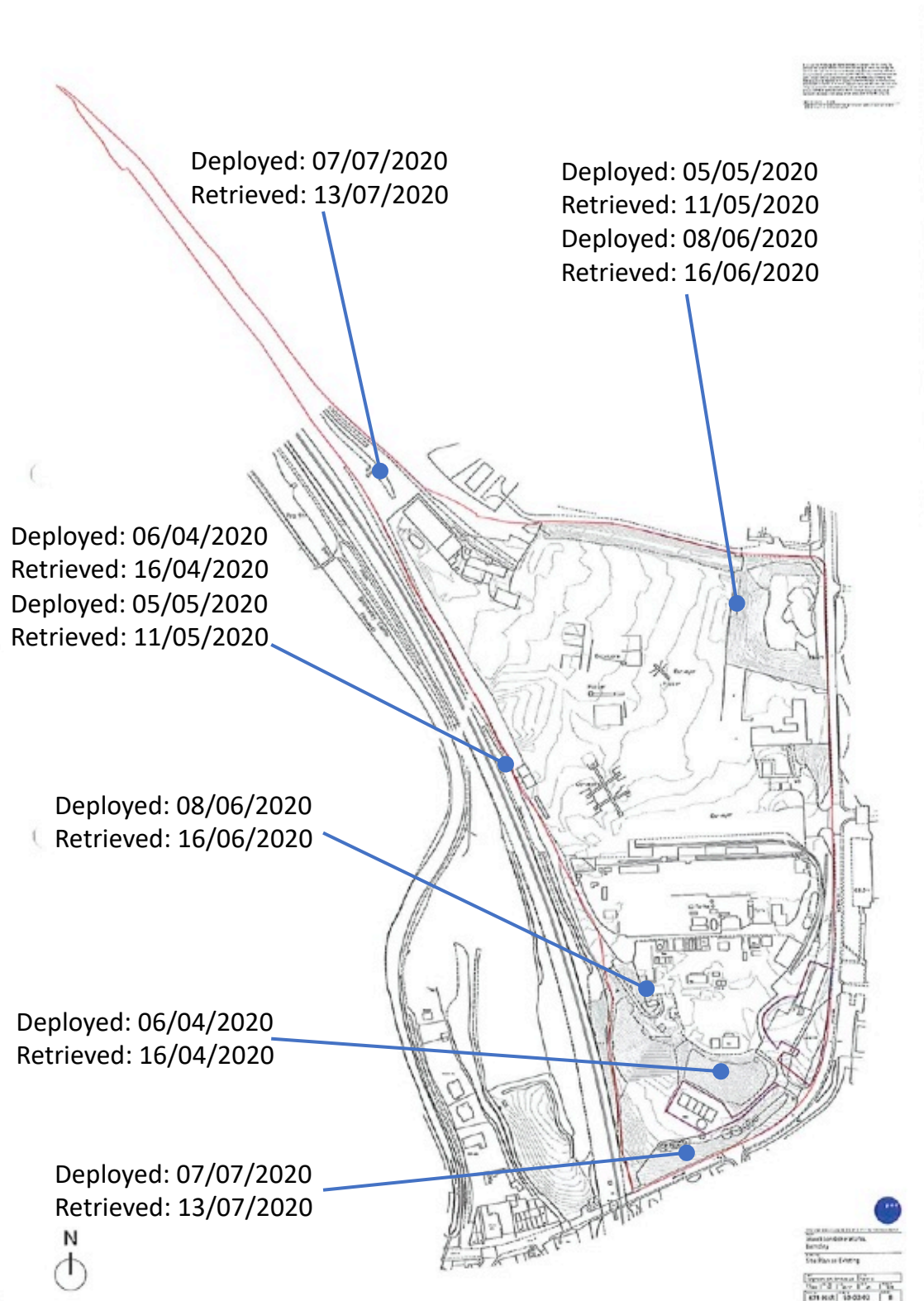


July Transect results

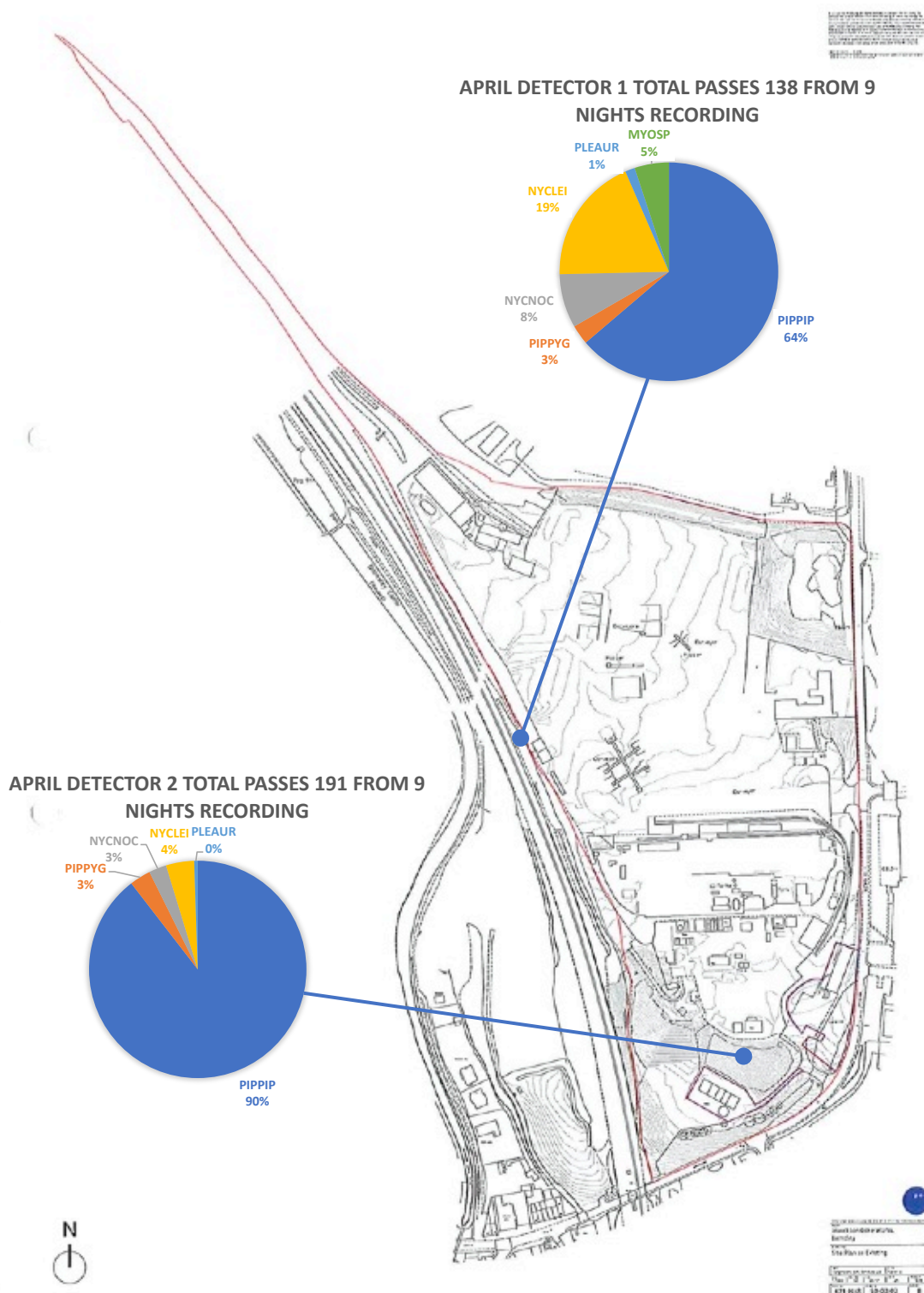
Ref:	Species	Time	Notes
A	Start	21:14	
A	Stopping point	21:14	3 minutes
B	Stopping point	21:20	3 minutes
D	Stopping point	21:31	3 minutes
F	Stopping point	21:42	3 minutes
E	Stopping point	21:50	3 minutes
1	PIPPIP	21:58	Call only
2	PIPPIP	21:59	Call only
G	Stopping point	22:00	3 minutes
H	Stopping point	22:09	3 minutes
I	Stopping point	22:16	3 minutes
3	NYCNOC	22:21	Faint call over railway
J	Stopping point	22:23	3 minutes
K	Stopping point	22:28	3 minutes
L	Stopping point	22:36	3 minutes
4	MYODAU	22:44	Feed briefly over pond
5	PIPPIP	22:44	Call only
6	NYCNOC	22:45	Call only
4	MYODAU	22:45	Call only
7	NYCNOC	22:48	Call only
7	PIPPIP	22:48	Call only
8	MYODAU	22:49	Commute
9	PIPPIP	22:49	Foraging
10	MYODAU	22:52	Call only
11	PIPPIP	22:53	Feeding beneath street lights
A	Stopping point	22:57	3 minutes
A	NYCNOC	22:57	Constant feed over Rabbit Ings for whole of stop
M	Stopping point	23:06	3 minutes
12	NYCNOC	23:12	Feeding over Rabbit Ings
A	Stopping point	23:13	3 minutes
A	NYCNOC	22:13	Repeated feed over Rabbit Ings until end of survey
	Finish	23:18	

Key: PIPPIP – Common pipistrelle, NYCNOC – Noctule Bat, MYODAU – Daubenton's bat

8.9 Figure 9: Static Bat Detector Locations and Deployment Dates

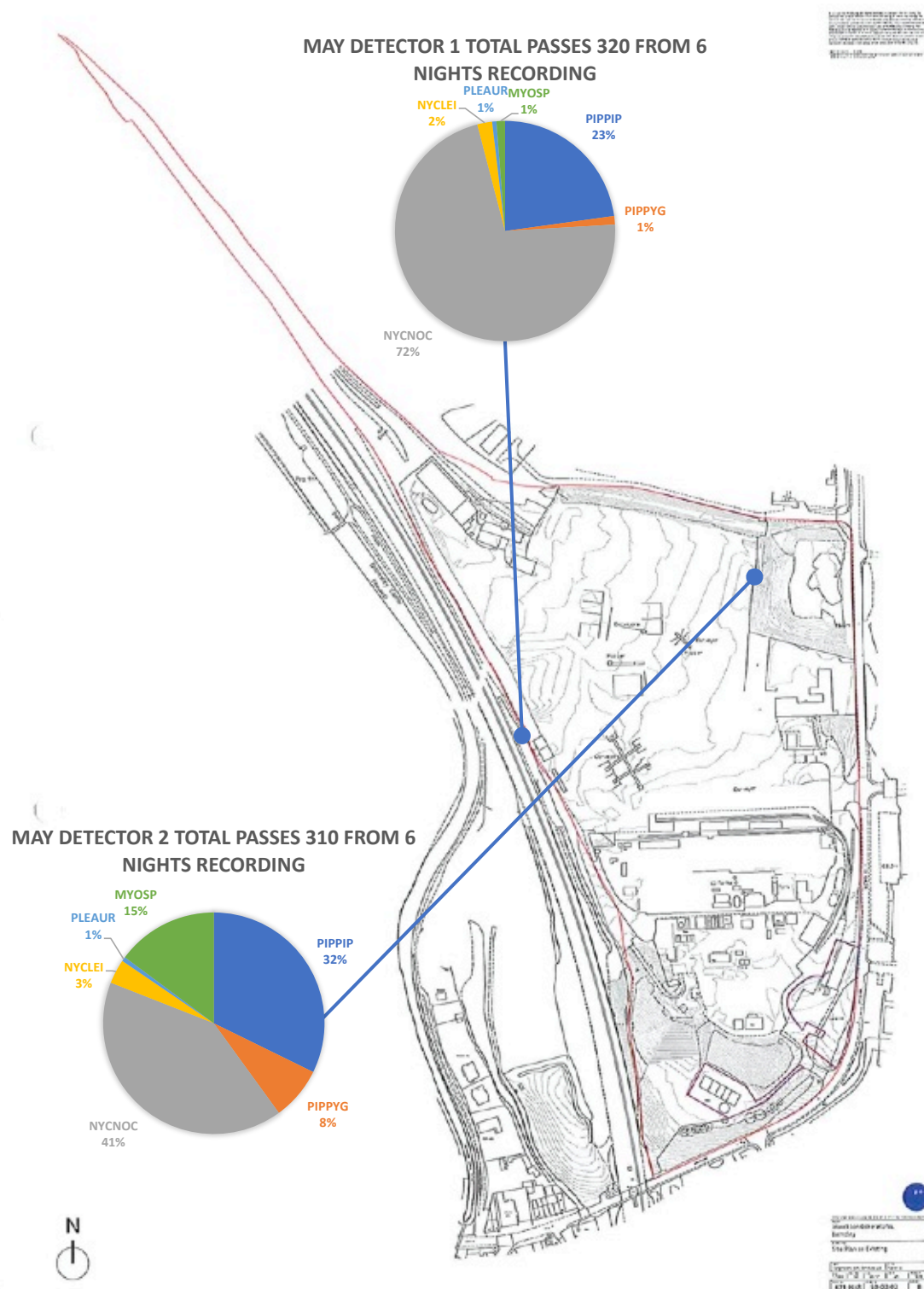


8.10 Figure 10: Static Bat Detector Results April 2020

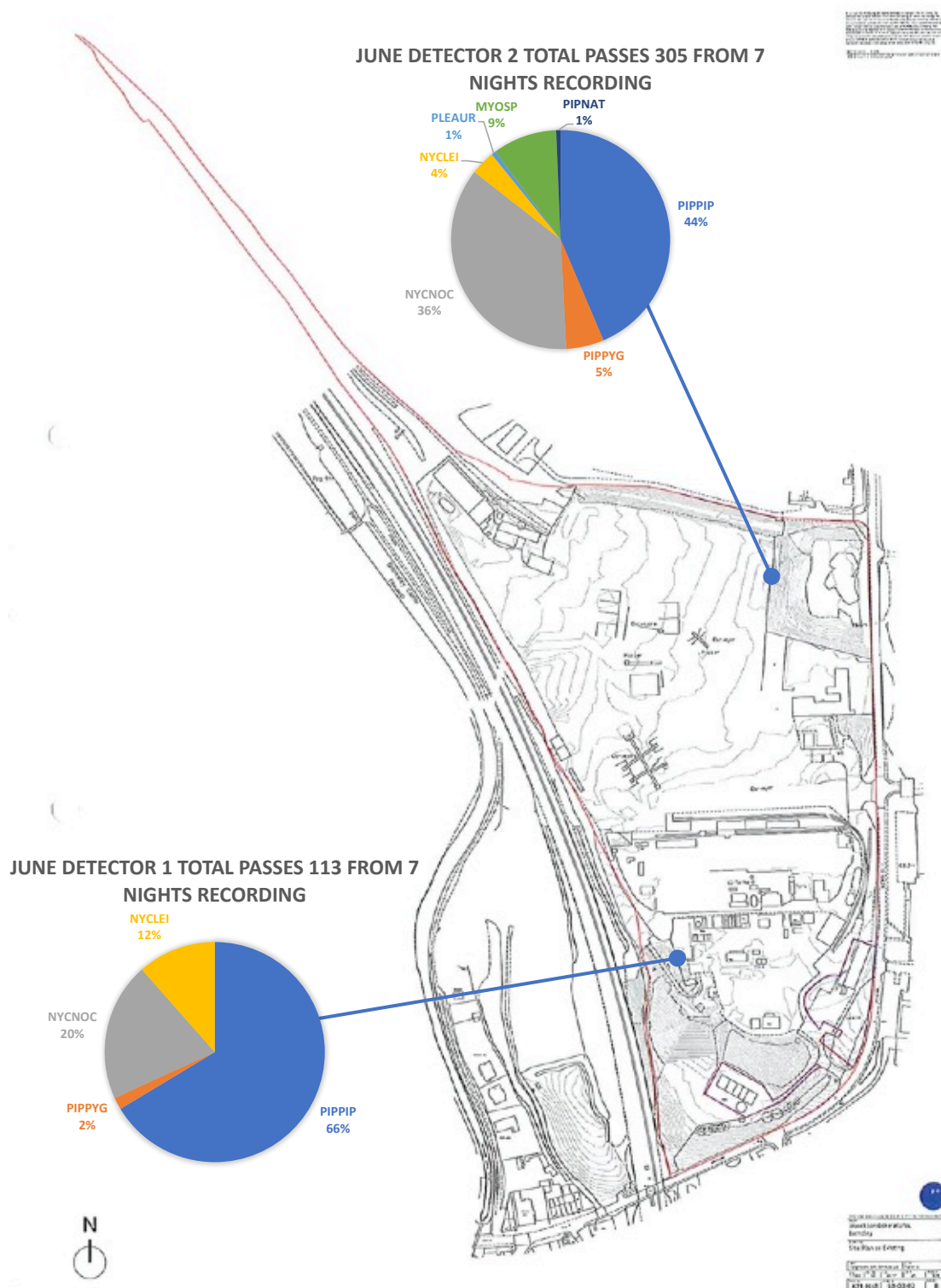


Key: PIPPIP – Common pipistrelle, PIPPYG – Soprano pipistrelle, NYCNOC – Noctule Bat, NYCLEI – Leisler's bat, MYOSP – Myotis Bat Species, PLEAUR – Brown long-eared bat, PIPNAT – Nathusius pipistrelle

8.11 Figure 11: Static Bat Detector Results May 2020

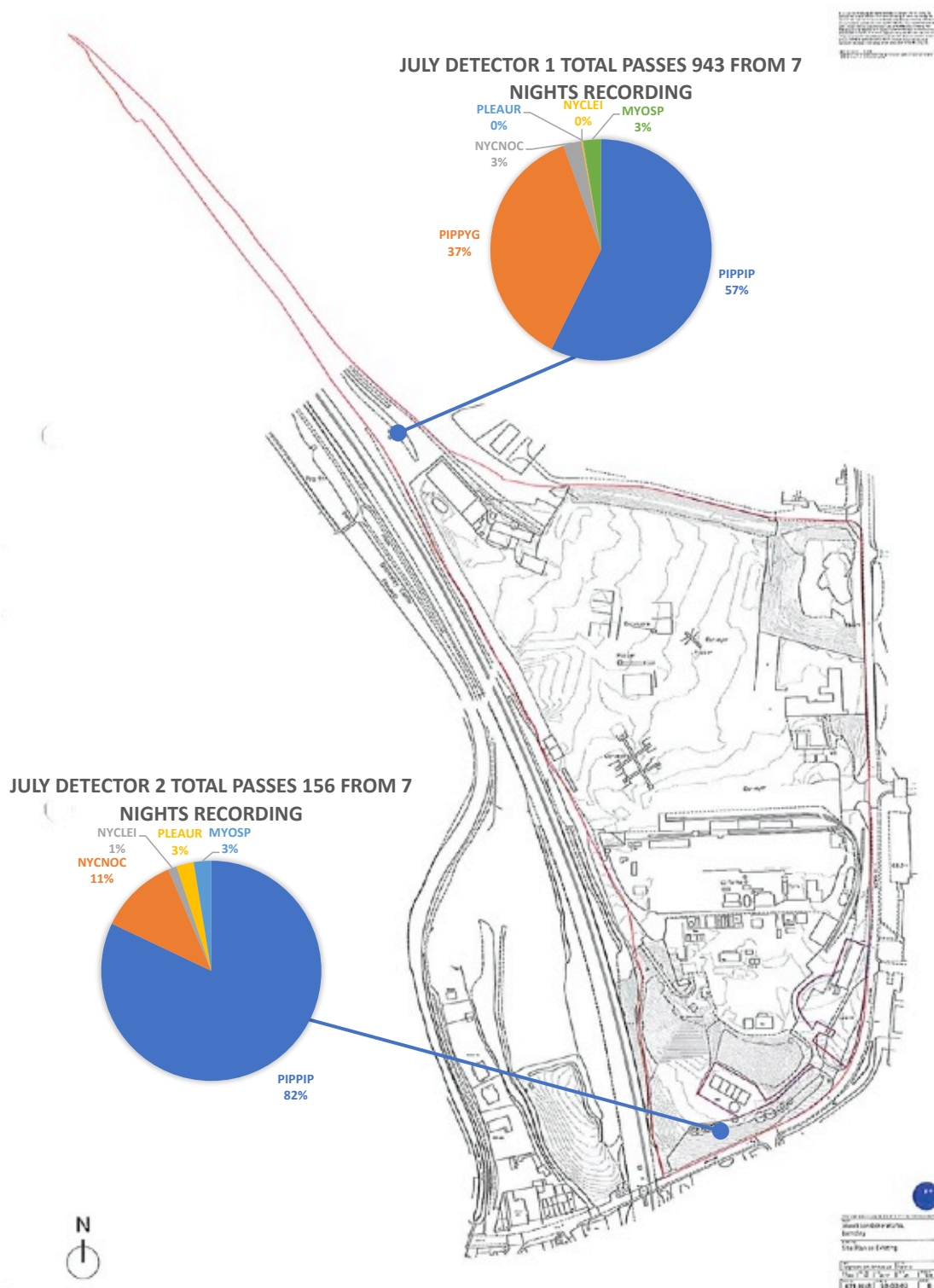


8.12 Figure 12: Static Bat Detector Results June 2020



Key: PIPPIP – Common pipistrelle, PIPPYG – Soprano pipistrelle, NYCNOC – Noctule Bat, NYCLEI – Leisler's bat, MYOSP – Myotis Bat Species, PLEAUR – Brown long-eared bat, PIP NAT – Nathusius pipistrell

8.13 Figure 13: Static Bat Detector Results July 2020



Appendix A Desk Study Information

A.1 Results Provided by South Yorkshire Bat Group

Date	Grid Ref	Species	Number
09/07/2012	SE357117	Common pipistrelle	1
07/08/2012	SE357117	Common pipistrelle	1
09/07/2014	SE359113	Common pipistrelle	1
31/05/1994	SE350115	Noctule	1
31/05/1994	SE350115	Pipistrelle sp.	3
31/05/1994	SE350115	Pipistrelle sp.	3
02/08/2000	SE354118	Vespertilionidae	+ Dr
02/08/2000	SE354118	Vespertilionidae	Unknown
29/09/2015	SE357117	Pipistrelle sp.	1
11/01/2016	SE357117	Pipistrelle sp.	1
16/06/2005	SE357118	Pipistrelle sp.	1-2
16/06/2005	SE357118	Vespertilionidae	Unknown
31/08/2010	SE358113	Vespertilionidae	Unknown
27/04/2006	SE351129	Vespertilionidae	Unknown
22/05/1989	SE350131	Leisler's bat	23
27/08/2015	SE360109	Pipistrelle sp.	1
19/04/1988	SE360100	Pipistrelle sp.	1
01/08/1990	SE360100	Pipistrelle sp.	1
27/07/1991	SE360100	Pipistrelle sp.	1
29/04/1998	SE360100	Pipistrelle sp.	1
20/07/1991	SE363106	Pipistrelle sp.	1
20/11/1995	SE363106	Pipistrelle sp.	1
20/06/1992	SE364104	Pipistrelle sp.	1
17/07/2016	SE366102	Whiskered bat	1
2004	SE367100	Vespertilionidae	Present
	SE367100	Vespertilionidae	1
21/04/2018	SE360110	Common pipistrelle	1
27/08/2014	SE362114	Common pipistrelle	1
27/08/2014	SE362114	Common pipistrelle	1
29/09/2014	SE362114	Whiskered bat	1
06/12/2009	SE362119	Pipistrelle sp.	dr
18/05/1988	SE363116	Pipistrelle sp.	1
06/11/2009	SE362119	Pipistrelle sp.	0
15/04/1990	SE379103	Daubenton's bat	5
02/08/1990	SE370100	Pipistrelle sp.	1
16/04/1987	SE379103	Noctule	1
16/04/1987	SE379103	Pipistrelle sp.	3
22/04/1987	SE379103	Pipistrelle sp.	4
19/06/1987	SE379103	Noctule	1
19/06/1987	SE379103	Pipistrelle sp.	3
16/09/1987	SE379103	Pipistrelle sp.	1
06/07/1988	SE379103	Noctule	2
06/07/1988	SE379103	Pipistrelle sp.	2
16/05/1989	SE379103	Noctule	2
16/05/1989	SE379103	Pipistrelle sp.	1
05/07/1989	SE379103	Noctule	1
05/07/1989	SE379103	Pipistrelle sp.	1
12/04/1990	SE379103	Pipistrelle sp.	1
15/04/1990	SE379103	Pipistrelle sp.	1
22/04/1990	SE379103	Pipistrelle sp.	1
01/05/1990	SE379103	Noctule	1

29/04/1993	SE379103	Pipistrelle sp.	4
10/05/1995	SE379103	Daubenton's bat	2
28/04/2001	SE379103	Daubenton's bat	5
02/07/1995	SE370111	Pipistrelle sp.	42
02/07/1995	SE370111	Vespertilionidae	42
03/07/1995	SE370111	Pipistrelle sp.	4
14/06/2011	SE371114	Bat (species unknown)	2
28/06/2012	SE371114	Vespertilionidae	2
28/06/2012	SE371114	Bat (species unknown)	2
17/07/2014	SE371114	Bat (species unknown)	2
31/05/2007	SE372111	Pipistrelle sp.	Unknown
14/07/2006	SE373112	Vespertilionidae	Unknown
17/09/2002	SE377113	Vespertilionidae	Unknown
19/09/2002	SE377113	Vespertilionidae	Unknown
11/08/2000	SE373131	Vespertilionidae	Unknown
05/06/2006	SE381130	Common pipistrelle	Unknown
02/07/2004	SE383141	Pipistrelle sp.	1 + dr
01/06/2015	SE391113	Common pipistrelle	1
04/07/2011	SE397125	Vespertilionidae	57
23/04/2009	SE390127	Brown long-eared bat	5

A.2 Results Provided by West Yorkshire Bat Group

Date	Grid Ref	Species	Number
22/04/1990	SE379103	Pipistrellus	1 Count of Adult
31/05/1994	SE350115	Pipistrellus	unknown Count of Adult
03/07/1995	SE370111	Pipistrellus	21-50 Count of Adult
14/08/1997	SE350129	Common Pipistrelle	
05/07/2007	SE3844214371	Pipistrelle Bat species	not recorded Range
22/07/2002	SE352117	Vesper Bat species	
20/06/2003	SE3824014243	Vesper Bat species	
17/07/2015	SE35311299	Vesper Bat species	8 Count of Adult