Whitcher Wildlife Ltd.
Ecological Consultants.

LUNDHILL ROAD, BARNSLEY.

OS REF: SE 40510-01918.

BAT SURVEY.

Ref No: - **160588**

Date: **20th July 2017.**

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1. INTRODUCTION.

1.1. Persimmon Homes plan to develop an area of land off Lundhill Road, Wombwell. No development plans were available prior to this survey of the site.

1.2. Previous surveys have been carried out including an Extended Phase 1 Habitat Survey and great crested newt eDNA sampling. During the Extended Phase 1 Habitat Survey the site was assessed as being a suitable habitat for roosting bats. Therefore, bat transect surveys and automated surveys were required.

1.3. Whitcher Wildlife Ltd was therefore commissioned to carry out bat transect surveys and automated surveys of the site to establish whether there are any issues that may affect the proposed works.

1.4. These surveys were carried out on the following dates: -

Transect Survey 1 – 25th July 2016	Automated Survey 1 – 25th July to 30th July
Transect Survey 2 – 18th August 2016	Automated Survey 2 – 17th August to 22nd August
Transect Survey 3 – 30th September 2016	Automated Survey 3 – 29th September to 3rd October 2016
Transect Survey 4 – 26th October 2016	Automated Survey 4 – 26th October to 1st November 2016
Transect Survey 5 – 26th April 2017	Automated Survey 5 – 26th April to 1st May 2017
Transect Survey 6 – 31st May 2017	Automated Survey 6 – 25th May to 30th May 2017
Transect Survey 7 – 26th June 2017	Automated Survey 7 – 21st June to 26th June 2017.

1.4.1. This report outlines the findings of that survey and makes appropriate recommendations.

1.5. Appendix I of this report provides back ground information with respect to bats and the legal protection afforded to them.

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2. SURVEY METHODOLOGY.

2.1. Bat activity was monitored across the site at dusk and recorded during each of the surveys.

2.2. All survey work was carried out in line with Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition).*

2.3. This survey was carried out by James Campbell MCIEEM. Since 2003 James has had experience in a professional capacity as a Wildlife Consultant carrying out Ecology Surveys and Phase 1 Habitat surveys and is a full member of CIEEM. James holds licences with several licensing bodies including: -

- Natural England Survey Licences in respect of bats, great crested newts, white clawed crayfish and barn owls.
- Scottish Natural Heritage Licences in respect of bats and great crested newts.
- Countryside Council for Wales Licences in respect of bats and great crested newts.

He has also successfully completed numerous courses run by CIEEM, BCT and FSC regarding protected species and in carrying out Phase 1 Habitat surveys. He is also confined spaces trained and qualified to NVQ Level 2 in tree climbing and aerial rescue.

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3. SURVEY RESULTS.

3.1. Data Search Results.

3.1.1. During an initial survey of the site in 2014, Sheffield Biological Records Center was contacted for records of protected sites and/or protected species within and surrounding the survey area.

3.1.2. There were no protected sites identified within 1km of the survey area. There were records of water voles within 1km of the survey area but these records are outside the survey area.

3.1.3. An updated desktop search was carried out within publicly available documents of the areas surrounding the site.

3.1.4. No additional protected species were identified within the area surrounding the site although recent records of great crested newts, grass snakes, common lizards, water voles, otters and various species of bat were identified within 10km of the surveyed area. No records are specific to site.

3.2. Site Description.

3.2.1. The survey is a series of fields at the southern edge of Lundhill, Wombwell. The aerial photograph below shows the survey area.

3.2.2. The northwestern field is a large field currently grazed by horses. The south-eastern field is an arable field currently containing a silage crop.

3.3. Transect Survey Results.

3.3.1. The plan below shows the transect route marked with yellow arrows and the nineteen pre-defined stopping points.

3.3.2. Transect 1.

3.3.2.1. The first transect survey was carried out at dusk on the 25th July 2016. The survey involved walking route one to nineteen shown on the plan above.

3.3.2.2. The weather at the time of the survey was dry, clear and still. The wind speed remained at 1mph (1 on the Beaufort scale) throughout the survey. The temperature at 21.00 was 16°C and 24°C at 23.00.

3.3.2.3. The survey was carried out by one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat recorder to record bat activity for subsequent analysis using Analook software. The survey commenced at 21.15 with each stop being three minutes in length.

3.3.2.4. The table below shows the findings from 1st Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	21:15 – 21:18	No bat activity.
Walk.	21:18 – 21:20	No bat activity.
Stop 2.	21:20 – 21:23	No bat activity.
Walk.	21:23 – 21:25	No bat activity.
Stop 3.	21:25 – 21:28	No bat activity.
Walk.	21:28 – 21:30	No bat activity.
Stop 4.	21:30 – 21:33	No bat activity.
Walk.	21:33 – 21:34	No bat activity.
Stop 5.	21:34 – 21:37	21:36 A Noctule bat was identified foraging from the east to the west along the Lombardi poplars.
Walk.	21:37 – 21:40	21:39 A Noctule bat was identified foraging from the east to the west over the site.
Stop 6.	21:40 – 21:43	21:40 A Noctule bat was identified foraging from the east to the west over the site. 21:41 A Pipistrelle bat was identified flying from the north to the south over the site. 21:41 A Pipistrelle bat was identified flying from the north to the south over the site. 21:41 A Noctule bat was identified foraging from the east to the west over the site. 21:42 A Pipistrelle bat was identified flying from the north to the south over the site.
Walk.	21:43 – 21:46	21:44 Two Noctule bats were identified flying from the east to the west over the site. 21:44 A Pipistrelle bat was identified flying from the north to the south over the site. 21:44 A Pipistrelle bat was identified flying from the south to the north over the site.
Stop 7.	21:46 – 21:49	21:46 A Pipistrelle bat was identified foraging along the northern boundary of the site. 21:47 A Noctule bat was identified foraging from the east to the west over the site. 21:48 A Pipistrelle bat was identified foraging along the northern boundary of the site.
Walk.	21:50	21:50 A Pipistrelle bat was identified foraging along the northern boundary of the site.
Stop 8.	21:51 – 21:54	No bat activity.
Walk.	21:55	21:55 A Pipistrelle bat was identified foraging from east to west along the hedgerow along the northern boundary of the site. 21:55 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site.
Stop 9.	21:56 – 21:59	21:56 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 21:57 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 21:58 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 21:58 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 21:58 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site.
Walk.	21:59 – 22:01	22:00 A Pipistrelle bat was identified foraging from west to east

		along the hedgerow along the northern boundary of the site. 22:00 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 22:00 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site. 22:00 A Pipistrelle bat was identified foraging from west to east along the hedgerow along the northern boundary of the site.
Stop 10.	22:02 – 22:05	22:02 A Pipistrelle bat was identified foraging to the east over an area of an area of grassland. 22:03 A Pipistrelle bat was identified foraging from south to the north along the hedgerow. 22:03 A Pipistrelle bat was identified foraging from south to the north along the hedgerow.
Walk.	22:06	22:06 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow.
Stop 11.	22:07 – 22:10	22:07 A Pipistrelle bat was identified foraging to the east around the housing estate and hedgerows. 22:08 A Pipistrelle bat was identified foraging to the east around the housing estate and hedgerows. 22:09 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:10 A Pipistrelle bat was identified foraging from the east to the west along the canal.
Walk.	22:11 – 22:24	22:11 A Pipistrelle bat was identified foraging from the east to the west along the canal.
Stop 12.	22:13 – 22:16	22:13 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:13 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:14 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:15 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:15 A Pipistrelle bat was identified foraging from the east to the west along the canal.
Walk	22:17	22:17 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:17 A Pipistrelle bat was identified foraging from the east to the west along the canal.
Stop 13.	22:18 – 22:21	22:19 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:20 A Pipistrelle bat was identified foraging from the east to the west along the canal. 22:21 A Pipistrelle bat was identified foraging from the east to the west along the canal.
Walk.	22:22	No bat activity.
Stop 14.	22:23 – 22:26	22:23 A Pipistrelle bat was identified foraging from the north to the south along the hedgerow. 22:24 A Pipistrelle bat was identified foraging from the north to the south along the hedgerow. 22:25 Two Pipistrelle bats were identified foraging from the north to the south along the hedgerow.
Walk.	22:27 – 22:28	22:27 A Pipistrelle bat was identified foraging from the north to the south along the hedgerow. 22:27 A Pipistrelle bat was identified foraging from the north to the south along the hedgerow. 22:28 A Pipistrelle bat was identified foraging from the north to the

		south along the hedgerow.
Stop 15.	22:29 – 22:32	22:29 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:29 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:29 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:30 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:30 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:31 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:31 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow. 22:32 A Pipistrelle bat was identified foraging from the east to the west along the hedgerow.
Walk.	22:33 – 22:34	No bat activity.
Stop 16.	22:35 – 22:38	22:36 A Noctule bat was identified flying from the north to the south over the site. 22:37 A Noctule bat was identified flying from the north to the south over the site. 22:38 A Pipistrelle bat was identified flying from the north to the south over the site. 22:38 A Pipistrelle bat was identified flying from the north to the south over the site.
Walk.	22:39	No bat activity.
Stop 17.	22:40 – 22:43	22:40 A Pipistrelle bat was heard foraging but not seen. 22:42 A Pipistrelle bat was heard foraging but not seen.
Walk.	22:44	22:44 A Pipistrelle bat was heard foraging but not seen.
Stop 18.	22:45 – 22:48	22:46 A Pipistrelle bat was heard foraging but not seen. 22:46 A Pipistrelle bat was heard foraging but not seen.
Walk.	22:49	22:49 A Pipistrelle bat was identified foraging from the north to the south over the site.
Stop 19.	22:50 – 22:52	22:50 A Pipistrelle bat was identified foraging from the north to the south over the site. 22:51 A Pipistrelle bat was identified foraging from the north to the south over the site. 22:52 A Pipistrelle bat was identified foraging from the north to the south over the site.

3.3.2.5. Anabat 1 recorded one hundred and twenty-two bat calls throughout the survey: -

- Eighty-five Noctule bat calls.
- Sixteen Common Pipistrelle bat calls.
- Nineteen Soprano Pipistrelle bat calls.
- Two Whiskered bat calls.

3.3.3. Transect 2.

3.3.3.1. The second transect survey was carried out at dawn on the 18th August 2016. The survey involved walking route one to nineteen shown on the plan in 3.3.1.

3.3.3.2. The weather at the time of the survey was warm and still. The wind speed remained at 1mph (1 on the Beaufort scale) throughout the survey. The temperature at 03.55 was 11°C and 24°C at 05.56.

3.3.3.3. The survey was carried out by one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat recorder to record bat activity for subsequent analysis using Analook software. The survey commenced at 03.35 with each stop being three minutes in length.

3.3.3.4. The table below shows the findings from 2nd Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	03:55 – 03:58	03:55 A Common Pipistrelle bat was heard and not seen.
Walk.	03:59 – 04:01	No bat activity.
Stop 2.	04:02 – 04:05	04:02 A Common Pipistrelle bat was heard and not seen.
Walk.	04:06 – 04:07	No bat activity.
Stop 3.	04:08 – 04:11	No bat activity.
Walk.	04:24 – 04:14	No bat activity.
Stop 4.	04:15 – 04:18	No bat activity.
Walk.	04:19 – 04:20	No bat activity.
Stop 5.	04:21 – 04:24	No bat activity.
Walk.	04:25 – 04:27	No bat activity.
Stop 6.	04:28 – 04:31	No bat activity.
Walk.	04:32	04:32 A Common Pipistrelle bat was identified foraging along the hedgerow across the centre of the site from the west to the east.
Stop 7.	04:33 – 04:36	No bat activity.
Walk.	04:37 – 04:38	No bat activity.
Stop 8.	04:39 – 04:42	04:42 A Common Pipistrelle bat was identified over the site from the north to the south.
Walk.	04:43 – 04:44	04:44 A Common Pipistrelle bat was identified foraging along the hedgerow across the centre of the site from the west to the east.
Stop 9.	04:45 – 04:48	No bat activity.
Walk.	04:49 – 04:51	No bat activity.
Stop 10.	04:52 – 04:55	No bat activity.
Walk.	04:56 – 04:58	04:58 A Common Pipistrelle bat was identified foraging along the canal to the south of the site from the west to the east.
Stop 11.	04:59 – 05:02	04:59 A Common Pipistrelle bat was identified foraging along

		the canal to the south of the site from the west to the east. 05:02 A Common Pipistrelle bat was identified foraging along the canal to the south of the site from the west to the east.
Walk.	05:03 – 05:04	No bat activity.
Stop 12.	05:05 – 05:08	05:08 A Common Pipistrelle bat was identified foraging along the canal to the south of the site from the west to the east.
Walk	05:09 – 05:10	05.09 A Common Pipistrelle bat was identified over the site from the north to the south.
Stop 13.	05:11 – 05:14	05:24 A Common Pipistrelle bat was identified foraging along the canal to the south of the site from the west to the east.
Walk.	05:15 – 05:16	05:16 A Common Pipistrelle bat was identified foraging along the canal to the south of the site from the west to the east.
Stop 14.	05:17 – 05:20	No bat activity.
Walk.	05:21 – 05:23	05:21 Two Common Pipistrelle bats were identified foraging over the site from the west to the east. 05:22 A Common Pipistrelle bat was identified flying from the west to the east over the site. 05:23 A Common Pipistrelle bat was identified flying from the west to the east over the site.
Stop 15.	05:24 – 05:27	05:25 A Common Pipistrelle bat was identified flying from the west to the east over the site. 05:26 A Common Pipistrelle bat was identified flying along the hedge in the centre of the site from west to the east.
Walk.	05:28 – 05:31	No bat activity.
Stop 16.	05:32 – 05:35	05:32 A Common Pipistrelle bat was identified foraging over the site from the north to the south.
Walk.	05:34 – 05:38	No bat activity.
Stop 17.	05:39 – 05:42	No bat activity.
Walk.	05:43 – 05:44	No bat activity.
Stop 18.	05:45 – 05:48	No bat activity.
Walk.	05:49 – 05:52	No bat activity.
Stop 19.	05:53 – 05:56	No bat activity.

3.3.3.5. Anabat 1 recorded one hundred and twenty-two bat calls throughout the survey: -

- Twenty-nine Noctule bat calls.
- Twenty Common Pipistrelle bat calls.
- Five Soprano Pipistrelle bat calls.

3.3.4. Transect 3.

3.3.4.1. The third transect survey was carried out at dusk on the 30th September 2016. The survey involved walking route one to nineteen shown on the plan in 3.3.1.

3.3.4.2. The wind was from the southwest at a speed 9mph (3 on the Beaufort scale) although the site remained quite sheltered with a temperature of 13°C at 18.45. Sunset was at 18:43.

3.3.4.3. The survey was carried out using one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat recorder to record bat activity for subsequent computer analysis using Analook software. The survey commenced at 18.40 with each stop being three minutes in length.

3.3.4.4. The table below shows the findings from 3rd Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	18:40 – 18:43	No bat activity.
Walk.	18:43 – 18:45	No bat activity.
Stop 2.	18:45 – 18:50	No bat activity.
Walk.	18:50 – 18:51	Noctule passed over.
Stop 3.	18:51 – 18:56	No bat activity.
Walk.	18:56 – 18:57	No bat activity.
Stop 4.	18:57 – 19:00	No bat activity.
Walk.	19:00 – 19:02	No bat activity.
Stop 5.	19:02 – 19:05	No bat activity.
Walk.	19:05 – 19:07	No bat activity.
Stop 6.	19:07 – 19:10	No bat activity.
Walk.	19:10 – 19:12	No bat activity.
Stop 7.	19:12 – 19:15	19:13. Common Pipistrelle heard not seen. 19:13. Common Pipistrelle foraging over gardens.
Walk.	19:15 – 19:16	No bat activity.
Stop 8.	19:16 – 19:19	No bat activity.
Walk.	19:19 – 19:20	19:20. Soprano Pipistrelle foraging along hedgerow.
Stop 9.	19:20 – 19:23	19:22. Soprano Pipistrelle foraging.
Walk.	19:23 – 19:25	No bat activity.
Stop 10.	19:25 – 19:28	19:26. Soprano Pipistrelle heard not seen.
Walk.	19:28 – 19:29	No bat activity.
Stop 11.	19:29 – 19:32	No bat activity.
Walk.	19:32 – 19:33	No bat activity.
Stop 12.	19:33 – 19:36	No bat activity.
Walk	19:36 – 19:38	No bat activity.
Stop 13.	19:38 – 19:41	No bat activity.
Walk.	19:41 – 19:42	No bat activity.
Stop 14.	19:42 – 19:45	19:44. Noctule passed over.
Walk.	19:45 – 19:46	No bat activity.
Stop 15.	19:46 – 19:48	No bat activity.
Walk.	19:48 – 19:50	No bat activity.
Stop 16.	19:50 – 19:53	No bat activity.
Walk.	19:53 – 19:54	19:54. Common Pipistrelle heard not seen.
Stop 17.	19:54 – 19:57	No bat activity.
Walk.	19:57 – 19:58	19:57. Common Pipistrelle foraging.
Stop 18.	19:58 – 20:01	No bat activity.
Walk.	20:01 – 10:02	20:02. Common Pipistrelle foraging around gate.
Stop 19.	20:02 – 20:05	20:02. Common Pipistrelle foraging around gate.

3.3.4.5. Anabat 1 recorded five Noctules, three Soprano Pipistrelles and six Common Pipistrelles.

3.3.5. Transect 4.

3.3.5.1. The fourth transect survey was carried out at dusk on the 26th October 2016. The survey involved walking route one to nineteen shown on the plan in 3.3.1.

3.3.5.2. The wind was from the southwest at a speed 1mph (1 on the Beaufort scale) and was very still with a temperature of 12°C at 17.30. Sunset was at 17:45.

3.3.5.3. The survey was carried out by one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat recorder to record bat activity for subsequent computer analysis using Analook software. The survey commenced at 17.45 with each stop being three minutes in length.

3.3.5.4. The table below shows the findings from 4th Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	17:45 – 17:48	17:47 Common Pipistrelle seen flying over the road to the west of the site.
Walk.	17:49	17:49 Common Pipistrelle seen flying over the road to the north of the site.
Stop 2.	17:50 – 17:53	17:50 Common Pipistrelle seen foraging over the houses to the north of the site. 17:52 Common Pipistrelle flew onto the site to the south.
Walk.	17:54 – 17:55	No bat activity.
Stop 3.	17:56 – 17:59	17:57 Common Pipistrelle seen foraging over the houses to the north east of the site.
Walk.	18:00	No bat activity.
Stop 4.	18:01 – 18:04	18:04 Common Pipistrelle seen foraging from the east to the west over the site.
Walk.	18:05	No bat activity.
Stop 5.	18:06 – 18:09	18:07 Two Common Pipistrelle bats seen foraging from the east to the west over the site.
Walk.	18:10	No bat activity.
Stop 6.	18:11 – 18:14	18:13 A Common Pipistrelle was seen foraging along the hedgerow through the centre of the site from the east to the west.
Walk.	18:15	18:15 A Common Pipistrelle was seen foraging along the hedgerow through the centre of the site from the east to the west.

Stop 7.	18:16 – 18:19	19:13 Common Pipistrelle seen foraging from the south to the north over the site.
Walk.	18:20	No bat activity.
Stop 8.	18:21 – 18:24	No bat activity.
Walk.	18:25	No bat activity.
Stop 9.	18:26 – 18:29	No bat activity.
Walk.	18:30	No bat activity.
Stop 10.	18:31 – 18:34	No bat activity.
Walk.	18:35	No bat activity.
Stop 11.	18:36 – 18:39	No bat activity.
Walk.	18:40	18:40 Common Pipistrelle seen foraging along the canal from the east to the west.
Stop 12.	18:41 – 18:44	No bat activity.
Walk	18:45	18:45 A Common Pipistrelle was seen foraging along from the north to the south along the boundary hedgerow.
Stop 13.	18:46 – 18:49	No bat activity.
Walk.	18:50	18:50 Common Pipistrelle seen foraging from the east to the west across the site.
Stop 14.	18:51 – 18:54	18:54 Common Pipistrelle seen foraging from the east to the west across the site.
Walk.	18:55	18:55 Common Pipistrelle seen foraging from the east to the west across the site.
Stop 15.	18:56 – 18:59	18:56 Common Pipistrelle heard foraging in the distance. 18:57 Common Pipistrelle heard foraging in the distance.
Walk.	19:00	19:00 Noctule bat heard passing over the site.
Stop 16.	19:01 – 19:04	19:01 Noctule bat heard passing over the site.
Walk.	19:05	No bat activity.
Stop 17.	19:06 – 19:09	No bat activity.
Walk.	19:10	No bat activity.
Stop 18.	19:11 – 19:14	No bat activity.
Walk.	19:15	No bat activity.
Stop 19.	19:16 – 19:19	No bat activity.

3.3.5.5. Anabat 1 recorded two Noctule calls and thirty Common Pipistrelle calls.

3.3.6. Transect 5.

3.3.6.1. The fifth transect survey was carried out at dusk on the 26th April 2017. The survey involved walking route one to nineteen shown on plan 3.3.1. However, the surveyor walked points 1 to 8, 16 to 19 and then moved to the second field and walked 11 to 15 finishing with 9 and then 10.

3.3.6.2. The wind was from the northwest at 1mph (1 on the Beaufort scale) with a temperature of 8°C at 20.30. Sunset was at 20:27.

3.3.6.3. The survey was carried out using one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat

recorder to record bat activity for subsequent computer analysis using Analook software. The survey commenced at 20.50 with each stop being three minutes in length.

3.3.6.4. The table below shows the findings from 5th Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	20:52 – 20:55	No bat activity
Walk.	20:55 – 20:56	No bat activity
Stop 2.	20:56 – 20:59	No bat activity
Walk.	20:59 – 21:00	20:59 Common Pipistrelle briefly heard passing over, not recorded on Anabat.
Stop 3.	21:00 – 21:03	No bat activity
Walk.	21:03 – 21:04	No bat activity
Stop 4.	21:04 – 21:07	No bat activity
Walk.	21:07 – 21:08	No bat activity
Stop 5.	21:08 – 21:11	No bat activity
Walk.	21:11 - 21:11	No bat activity
Stop 6.	21:11 – 21:14	No bat activity
Walk.	21:14 – 21:15	No bat activity
Stop 7.	21:15 – 21:18	No bat activity
Walk.	21:18 – 21:19	No bat activity
Stop 8.	21:19 – 21:22	21:20. Soprano Pipistrelle briefly heard passing over and recorded on the Anabat.
Walk.	21:22 – 21:23	No bat activity
Stop 16.	21:23 – 21:26	No bat activity
Walk.	21:26 – 21:26	No bat activity
Stop 17.	21:26 – 21:29	No bat activity
Walk.	21:29 – 21:30	No bat activity
Stop 18.	21:30 – 21:33	No bat activity
Walk.	21:33 – 21:34	No bat activity
Stop 19.	21:34 – 21:37	No bat activity
Walk	21:37 – 21:44	No bat activity
Stop 11.	21:44 – 21:47	No bat activity
Walk.	21:47 – 21:48	No bat activity
Stop 12.	21:48 – 21:51	No bat activity
Walk.	21:51 – 21:52	No bat activity
Stop 13.	21:52 – 21:55	21:52. Common Pipistrelle briefly heard passing over, not recorded on Anabat.
Walk.	21:55 – 21:56	No bat activity
Stop 14.	21:56 – 21:59	No bat activity
Walk.	21:59 – 22:00	No bat activity
Stop 15.	22:00 – 22:03	No bat activity
Walk.	22:03 – 22:04	No bat activity
Stop 9.	22:04 – 22:07	No bat activity
Walk.	22:07 – 22:07	No bat activity
Stop 10.	22:07 – 22:10	No bat activity

3.3.6.5. Anabat 11 recorded one Soprano Pipistrelle only. The evening was quite cold and it is early in the survey season and this probably accounts for the low survey results.

3.3.7. Transect 6.

3.3.7.1. The sixth transect survey was carried out at dusk on the 31st May 2017. The survey involved walking route one to nineteen shown on plan 3.3.1. However, the surveyor walked points 1 to 8, 16 to 19 and then moved to the second field and walked 11 to 15 finishing with 9 and then 10.

3.3.7.2. The wind was very light, 0 on the Beaufort scale with a temperature of 19°C at 21.20. Sunset was at 21:24.

3.3.7.3. The survey was carried out using one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat recorder to record bat activity for subsequent computer analysis using Analook software. The survey commenced at 21.22 with each stop being three minutes in length.

3.3.7.4. The table below shows the findings from 6th Transect Survey.

Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	21:22 – 21:25	No bat activity
Walk.	21:25 – 21:26	No bat activity
Stop 2.	21:26 – 21:29	No bat activity
Walk.	21:29 – 21:30	No bat activity
Stop 3.	21:30 – 21:33	No bat activity
Walk.	21:33 – 21:36	No bat activity
Stop 4.	21:36 – 21:39	21:38. Noctule
Walk.	21:39 – 21:41	No bat activity
Stop 5.	21:41 – 21:44	21:43. Noctule
Walk.	21:44 - 21:44	No bat activity
Stop 6.	21:44 – 21:47	21:46. Noctule flew along over willow trees.
Walk.	21:47 – 21:48	Noctule foraging over the field throughout.
Stop 7.	21:48 – 21:51	21:48. Common Pipistrelle passed over stables going south. 21:50 to 21:51. Noctule foraging.
Walk.	21:51 – 21:52	21:51 to 21:52. Two Noctules foraging over field.
Stop 8.	21:52 – 21:55	21:52 to 21:55. Noctule continually foraging.
Walk.	21:55 – 21:55	Noctule continually foraging over field.
Stop 9.	21:55 – 21:58	21:55 to 21:58. Noctules continually foraging.

Walk.	21:58 – 21:59	Noctule continually foraging.
Stop 16.	21:59 – 22:02	Noctules continually foraging. 22:00. Common Pipistrelle foraging over hedgerow and gardens beyond.
Walk.	22:02 – 22:04	Noctule continually foraging.
Stop 17.	21:04 – 22:07	Noctule continually foraging. 22:05 to 22:07. Up to three Common Pipistrelles foraging.
Walk.	22:07 – 22:09	Noctules and Common Pipistrelles continually foraging.
Stop 18.	22:09 – 22:12	No bat activity
Walk	22:12 – 22:13	No bat activity
Stop 19.	22:13 – 22:16	22:14. Common Pipistrelle foraging alongside the road.
Walk/Drive.	22:16 – 22:19	No bat activity
Stop 11.	22:19 – 22:22	Noctules and Common Pipistrelles continually foraging.
Walk.	22:22 – 22:24	Noctules foraging.
Stop 12.	22:24 – 22:27	Distant Noctule foraging.
Walk.	22:27 – 22:28	No bat activity
Stop 13.	22:28 – 22:31	22:28 to 22:31. Common and Soprano Pipistrelles continually foraging. Distant Noctule foraging.
Walk.	22:31 – 22:32	Noctules and Common Pipistrelles foraging.
Stop 14.	22:32 – 22:35	Noctule, Common Pipistrelle and Soprano Pipistrelle, continually foraging
Walk.	22:35 – 22:36	Noctules and Common Pipistrelles continually foraging.
Stop 15.	22:36 – 22:41	22:39. Noctule 22:40. Noctule
Walk.	22:41 – 22:43	22:41. Common Pipistrelle foraging. 22:42. Common Pipistrelle foraging.
Stop 10.	22:43 – 22:46	22:44. Common Pipistrelle foraging.

3.3.7.5. Anabat 6 recorded forty Common Pipistrelle calls, twenty-four Soprano Pipistrelle calls and eighty-seven Noctule calls. This was a high level of bat activity, particularly the Noctule activity where the bats could be seen continually foraging across both fields.

3.3.8. Transect 7.

3.3.8.1. The seventh transect survey was carried out on the 26th June 2017. The survey involved walking route 1 shown on the plan in 3.3.1.

3.3.8.2. The wind was from the southwest at a speed 1 mph (1 on the Beaufort scale) and was very still with a temperature of 16ºC at 21.30. Sunset was at 21:30.

3.3.8.3. The survey was carried out by one surveyor equipped with a Batbox Duet detector covering the nineteen stops. In addition, the surveyor carried an Anabat

recorder to record bat activity for subsequent computer analysis using Analook software. The survey commenced at 21.45 with each stop being four minutes in length.

3.3.8.4. The table below shows the findings from 7th Transect Survey.

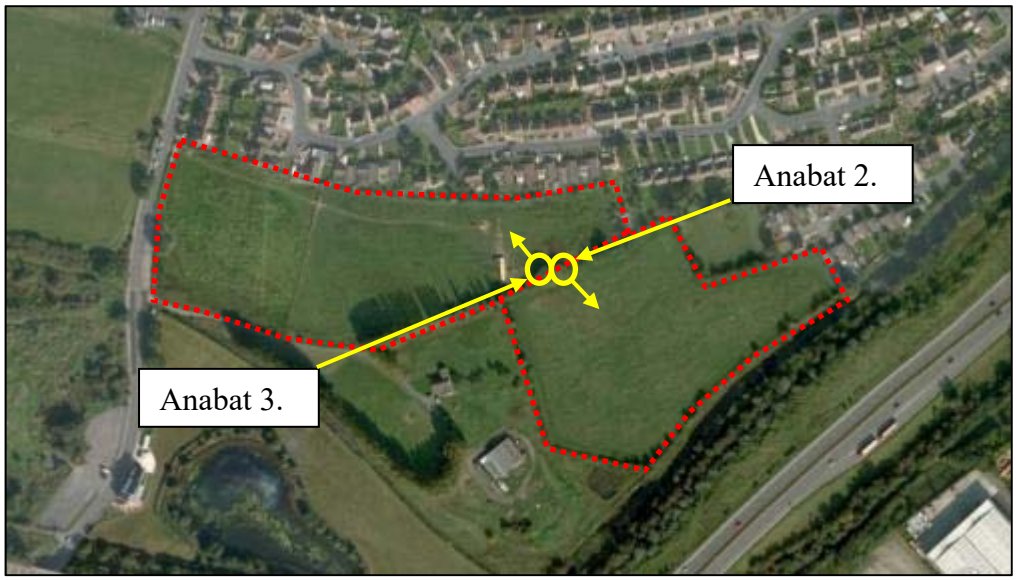
Location.	Time (start-end)	Surveyor Results.
Start. Stop1.	21:46 – 21:50	21:48 A Common Pipistrelle bat foraging from north to south along the hedgerow. 21:49 A Common Pipistrelle bat foraging from north to south along the hedgerow.
Walk.	21:51	No bat activity
Stop 2.	21:52 – 21:56	21:52 A Common Pipistrelle bat foraging from east to west along the canal. 21:54 A Common Pipistrelle bat foraging from east to west along the canal.
Walk.		No bat activity
Stop 3.	21:57 – 22:01	No bat activity
Walk.		No bat activity
Stop 4.	22:02 – 22:06	22:04 Two Common Pipistrelle bats foraging from east to west along the canal. 22:05 A Common Pipistrelle bat foraging from east to west along the canal.
Walk.	22:07	22:07 A Common Pipistrelle bat foraging from north to south along the hedgerow.
Stop 5.	22:08 – 22:12	22:08 Two Common Pipistrelle bats foraging from north to south along the hedgerow. 22:08 Three Common Pipistrelle bats foraging from north to south along the hedgerow. 22:12 A Common Pipistrelle bat foraging from north to south along the hedgerow.
Walk.		No bat activity
Stop 6.	22:14 – 22:18	22:14 Two Common Pipistrelle bats foraging from east to west along the hedgerow. 22:15 Two Common Pipistrelle bats foraging from east to west along the hedgerow. 22:16 Three Common Pipistrelle bats foraging from east to west along the hedgerow.
Walk.	22:19	22:19 Five Common Pipistrelle bats foraging from east to west along the hedgerow.
Stop 7.	22:20 – 22:24	22:22 Two Common Pipistrelle bats foraging from east to west along the hedgerow. 22:24 A Common Pipistrelle bat foraging from east to west along the hedgerow.
Walk.		No bat activity
Stop 8.	22:25 – 22:29	22:25 Two Common Pipistrelle bats foraging from east to west along the hedgerow. 22:29 A Common Pipistrelle bat foraging from east to west along the hedgerow.
Walk.	22:30	22:30 A Common Pipistrelle bat foraging from north to south along the hedgerow.
Stop 9.	22:31 – 22:35	22:32 A Common Pipistrelle bat was heard foraging

		in the distance. 22:33 A Noctule bat was heard foraging overhead.
Walk.		No bat activity
Stop 10.	22:36 – 22:40	22:36 A Common Pipistrelle bat foraging from north to south along the road. 22:37 A Common Pipistrelle bat foraging from north to south along the road. 22:39 A Common Pipistrelle bat foraging from north to south along the road.
Walk.		No bat activity
Stop 11.	22:41 – 22:45	22:41 A Common Pipistrelle bat foraging from north to south along the road.
Walk.		No bat activity
Stop 12.	22:46 – 22:50	22:49 A Common Pipistrelle bat foraging from north to south along the road.
Walk	22:51	22:51 A Common Pipistrelle bat foraging from east to west along the hedgerow
Stop 13.	22:52 – 22:56	22:57 A Common Pipistrelle bat was heard and not seen.
Walk.		No bat activity
Stop 14.	22:57 – 23:01	22:58 A Common Pipistrelle bat foraging from east to west along the Lombardi poplars. 23:00 A Common Pipistrelle bat foraging from east to west along the Lombardi poplars.
Walk.		No bat activity
Stop 15.	23:02 – 23:06	23:04 A Common Pipistrelle bat foraging from east to west along the Lombardi poplars.
Walk.	23:07	23:07 A Common Pipistrelle bat foraging from east to west along the Lombardi poplars. 23:07 A Noctule bat was heard and not seen.
Stop 16.	23:08 – 23:12	23:09 A Common Pipistrelle bat foraging from east to west along the Lombardi poplars.
Walk.		No bat activity
Stop 17.	23:13 – 23:17	23:16 A Common Pipistrelle bat foraging from north to the west over the field.
Walk.		No bat activity
Stop 18.	23:18 – 23:22	23:18 A common Pipistrelle bat foraging to the east over an area of scrub.
Walk.		No bat activity
Stop 19.	23:23 – 23:27	No bat activity

3.3.8.5. Anabat 1 recorded one hundred and five Common Pipistrelle calls and one Soprano Pipistrelle call.

3.4. Automated Survey Results.

3.4.1. The plan below shows the site boundary and the location of the two Anabat detectors used to gather data as part of the automated survey. In each case the recorders were erected on trees and left in place to record bat activity over a period of five days. Seven such surveys were carried out between July 2016 and June 2017.



3.4.2. The following tables show the bat activity recorded by each of the recorders during each of the survey.

Anabat 2. Survey Dates.	Myotis	Noctule	Common Pipistrelle	Soprano Pipistrelle	Total.
25th to 30th July 2016	46	193	492	197	928
17th to 22nd Aug 2016	0	37	10	0	47
29th Sept to 3rd Oct 2016	76	3	699	110	888
26th Oct to 1st Nov 2016	42	6	240	190	478
26th April to 1st May 2017	1	17	37	5	60
1st to 5th June 2017	2	197	40	1	240
21st to 26th June 2017	1	171	158	0	330

Total.	168	624	1,676	503	2,971
Anabat 3.	Myotis	Noctule	Common Pipistrelle	Soprano Pipistrelle	Total.
25th to 30th July 2016	6	118	159	15	298
17th to 22nd Aug 2016	3	50	105	6	164
29th Sept to 3rd Oct 2016	1	3	320	10	334
26th Oct to 1st Nov 2016	3	4	280	34	321
26th April to 1st May 2017	4	10	153	8	175
1st to 5th June 2017	17	159	558	50	784
21st to 26th June 2017	4	140	1,307	0	1,451
Total.	38	484	2,882	123	3,527

Anabats 2 & 3.	Myotis	Noctule	Common Pipistrelle	Soprano Pipistrelle	Total.
Total calls from Anabat 2.	168	624	1,676	503	2,971
Total calls from Anabat 3.	38	484	2.882	123	3,527
Total.	206	1,108	4,558	625	6,498

3.5. Working on an average recording time of nine hours per night for each of the Anabat recorders, the above figures represent approximately sixty-three hours of recording per Anabat or one hundred and twenty-six hours of recording in total. This represents an average of fifty-two bat passes per hour over the total duration of the surveys. This includes quite wide variations but the maximum activity level during the June transect survey recorded on Anabat 3 is the highest level of activity and that represents approximately two hundred calls per hour. Whichever way this is looked at, this represents a low level of bat activity.

3.6. A barn owl was seen flying from the west to the east across the site during the survey on a number of occasions.

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4. EVALUATION OF FINDINGS.

4.1. The level of bat activity identified on the site during all seven bat transect surveys was generally quite low with small numbers of Common Pipistrelles and Noctules and occasional Myotis. However, when a bat foraged over the site it passed back and forth and therefore was recorded multiple times before it moved away from the site.

4.2. The Common Pipistrelles were mainly identified coming onto the site from the residential properties to the north. Noctules generally came from the adjacent land to the west. The bats then tended to forage on the site and around the surrounding hedgerows and linear features.

4.3. The main areas of foraging activity were identified in the areas below: -

- The hedgerow and canal located along the southern boundary of the site.
- The east to west hedgerow through the middle of the between the two fields.
- The northern site boundary with the residential properties to the north.
- Lundhill Road along the western boundary of the site.
- Over the northern field.

4.4. The Anabat recordings from the seven automated surveys show: -

- Common Pipistrelle bat activity was the most frequently recorded species of bat with 4,558 calls recorded over 126 hours of recording. This is not a high level of activity at an average of thirty-six calls an hour, one very two minutes. Even at its highest, the number of calls recorded per hour during the June 2017 survey was one hundred and eighty-five calls per hour.

- Noctule bats were the second most frequent species recorded. Activity averaged around nine calls per hour although the experience of the transect surveys shows this to be sporadic with a single bat repeatedly crossing the site for a period followed by periods of no activity.

4.5. The development plan for the site shows the hedgerow separating the two fields in the middle of the site is to be removed. This removes a regularly used foraging and commuting route, albeit at a low level of activity. There will remain abundant foraging opportunities along the boundary hedgerows which are to be retained and in the surrounding area.

4.6. It is therefore assessed that the development of the site will have a low impact on small numbers of Common Pipistrelle and Noctule bats in particular and to a lesser extent on Soprano Pipistrelles and Myotis bats.

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5. RECOMMENDATIONS.

5.1. It is recommended that a hedgerow be planted across the site to maintain the continuity of the present hedgerow, foraging and commuting route running from east to west across the site.

5.2. It is recommended that the boundary trees and hedgerows are retained to provide foraging and commuting routes around the site.

5.3. It is recommended that the site lighting scheme be designed to avoid impact on bat foraging and commuting routes. The use of down lights is recommended.

5.4. In order to provide biodiversity enhancements, it is recommended that bat bricks be placed in 10% of the new properties in order to provide additional bat roosting opportunities.

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Prepared by:	
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Checked by:	
Derek Whitcher. BSc, MCIEEM, MCMI.	Date: 7th August 2017.

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Appendix I. BAT INFORMATION.

It is necessary to understand a little about bats, their basic nature, ecology and legal protection in order to evaluate the findings of this report.

18 species of bat currently reside in Britain, 17 of which are known to breed here. They are extremely difficult to identify in the hand and even more so in flight.

All appear to be diminishing in numbers, probably due to shortage of food, caused by pesticides, as insects are their sole diet, and habitat change.

As their diet consists solely of insects, bats hibernate during the winter when their food source is at its most scarce. They will spend the winter in hollow trees, caves, mines and the roofs of buildings.

Certain species, particularly the pipistrelle (the commonest and most widespread British bat) can quickly adapt to manmade structures and will readily use these to roost and to rear their young.

Bats are protected under the Wildlife and Countryside Act 1981, Regulation 41 of The Conservation of Habitats and Species Regulations 2010, and the Countryside & Rights of Way Act 2000.

It is an offence to intentionally or recklessly kill, injure or capture or disturb bats or to damage, destroy or obstruct access to any place used by bats for shelter or protection.

A breeding or resting site of any bat is known as a bat roost. A bat roost is therefore any structure a bat uses for shelter or protection. Because bats tend to use the same roosts each year, legal opinion is that the roost site is protected whether or not the bats are present at that time.

Bat roosts can be identified by looking for: -

- Suitable holes, cracks and crevices.
- Bat droppings.
- Prey remains.
- By carrying out night observations using a bat detector.

Where development proposals are likely to affect a bat roost site, a licence is required from Natural England.

The person applying for that licence has to be suitably qualified and experienced in bat matters. That person is then responsible for ensuring that the measures contained in the licence are carried out.