

Havant Thicket Reservoir New Pipeline Scheme

Bat Survey Report

Portsmouth Water Ltd.

November 2024



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1. Introduction

1.1. Terms of Reference

- 1.1.1. AtkinsRéalis (formerly Atkins Limited) was commissioned by Ward and Burke on behalf of Portsmouth Water to undertake bat surveys of two buildings and three trees at Bedhampton Pumping Station (hereafter referred to as the Site), to inform potential impacts in relation to a wider pipeline scheme (the Pipeline Scheme). The Site is located on the south western side of the town of Havant, with the location shown in Appendix A.
- 1.1.2. An Environmental Statement (ES) was produced for the Pipeline Scheme in May 2024 which should be read in conjunction with this report. The ES was submitted to support a planning application for the new dual pipeline scheme (Application ref: APP/24/00405).
- 1.1.3. This report summarises the details of the bat survey undertaken at the Site in 2023 and 2024, including the methods used, results of the survey, and provides recommendations relating to avoidance, mitigation, compensation and enhancement measures where applicable.

1.1.4. Legislation

- 1.1.5. Bats and their roosts are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). The combined effect of this legislation makes it an offence to:
- Intentionally or deliberately kill, injure or capture (take) bats.
 - Deliberately or recklessly disturb bats (whether in a roost or not) in such a way which is likely to:
 - Impair their ability to:
 - Survive, to breed or reproduce, or to rear or nurture their young; or,
 - Hibernate.
 - Affect significantly the local distribution or abundance of bats.
 - Damage, destroy or obstruct access to bat roosts.

1.2. The Pipeline Scheme

- 1.2.1. The Site forms part of a wider Pipeline Scheme, the Havant Thicket Reservoir Scheme. The objective of the Pipeline Scheme is to provide a new resource to supply drinking water in the water-stressed South East of England, while maximising the community and environmental benefits of a new raw water reservoir.
- 1.2.2. The Pipeline Scheme would transfer water from Bedhampton Springs to fill the reservoir in the winter and draw water off for treatment and supply when needed in the summer. It would also be used for emergency drawdown should the reservoir levels need to be reduced in emergency conditions, in accordance with the Environment Agency's safety guidance.
- 1.2.3. The Scheme is allocated in the adopted Havant Borough Council (HBC) and East Hampshire District Council (EHDC) Local Plans. Further information and details can be found in the Planning Statement, which accompanies the planning applications.

1.3. The Site

- 1.4. The Site is located to the south of the suburb of Bedhampton, central Ordnance Survey national grid reference (OSNGR) SU 70547 06314. The Site is bordered by the Hermitage Stream to the south east and a railway line to the north west. The habitats on Site primarily comprise other neutral grassland with scattered trees, mixed scrub and developed land comprising hardstanding and buildings, which are referenced as Bedhampton 1 and Bedhampton 2 (location shown in Appendix A). An area within the Site which was inaccessible at the time of the walkover survey, comprised a section of solar panels surrounded by grassland, which is not expected to be disturbed as a result of the Pipeline Scheme.
- 1.5. As part of the proposed works within the Site, works to both buildings will be undertaken to upgrade the existing facilities. This will include the installation of a turbidity monitoring system, switchboards

and new doors on Bedhampton 1 within the M & E store, with the south-eastern section of Bedhampton 2 to be demolished and re-built up to the height of the main building and the roof extended. Nine trees will be removed to enable the widening of roadways and footpaths within the site. Further investigation for bats was considered necessary to inform the final impacts of the proposed works within the Site on bats and any avoidance, mitigation, compensation or enhancement measures that would be required for bats as a result of the scheme.

1.6. Scope of the Assessment

1.6.1. This report presents ecological information relevant to bats, obtained during the following:

- A desk-study and consultation undertaken 15/02/2023 with updated license search on 26/10/2024;
- A Preliminary Roost Assessment (PRA) for bats undertaken on 30/01/2024;
- Ground Level Tree Assessment (GLTA) undertaken on 29/11/2023;
- Hibernation survey undertaken on 30/01/2024 with static deployment from 30/01/2024 – 28/02/2024;
- Bat emergence surveys undertaken on buildings Bedhampton 1 and 2 in July, August and September 2024; and
- Potential Roost Feature (PRF) inspection surveys undertaken on trees in August and September 2024.

2. Methods

2.1. Desk Study and Consultation

2.1.1. The geographical area for obtaining ecological data through desk studies (hereafter referred to as the Desk Study Search Area) has been informed by the project ZOI and zones of sensitivity for ecological features using best practice guidance and professional judgement.

2.1.2. Baseline data has been gathered from a range of sources through data requests, and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites and bat records. For records collected, only recent records, i.e. those within 10 years of the data collection date, have been considered within the assessment¹.

2.1.3. The Multi-Agency Geographic Information for the Countryside (MAGIC) website² was reviewed to identify:

- Granted European Protected Species (EPS) Mitigation Licences with respect to bats within 2 km of the Site; and,
- Statutory designated sites for bats within 10km.

Hampshire Biodiversity Information Centre (HBIC) was contacted to obtain recent³ records of bats within 2 km of the Site.

2.2. Ecological Field Surveys

2.2.1. The geographical area for undertaking ecological field surveys was determined using best practice survey guidance⁴, professional judgement and the zones of influence, which have been determined based on the nature of the impacts arising from the Proposed Scheme.

¹ A desk study has already been undertaken for the Pipeline Scheme on 15/02/2023 therefore, any records of bats within 2 km of the Site are taken from 10 years up to this date. This desk study was refined for 2km from the Site.

² Defra. Magic Map Application. [Online]. [Accessed 26/10/2024]. Available from: <https://magic.defra.gov.uk/MagicMap.aspx>

³ Defined as within the last 10 years, up until 15/02/2023.

⁴ Collins, J. (ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edition). The Bat Conservation Trust, London.

Surveyor Competencies

- 2.2.2. All the surveys were led by surveyors who have been assessed⁵ to be at least of capable experience following the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework⁶.
- 2.2.3. Due to the chance of encountering bats *in-situ* during the building internal inspections and PRF inspection surveys of trees, these surveys have been led by a suitably experienced surveyor who holds an appropriate Level 2 licence from Natural England⁷.

Preliminary Roost Assessment

- 2.2.4. AtkinsRéalis Ecologists undertook a PRA of the buildings (Bedhampton 1 and 2) within the Site on 30/01/2024. The assessment sought to identify external features such as missing or slipped tiles, missing mortar or gaps in the building which provide ingress and egress for bats. The internal building inspection involved a systematic search of the interior of the building, and loft space, if present and accessible, to identify potential or actual bat access points, roosting features and evidence of bats. Evidence of bats can include bats *in-situ* (alive or dead) and droppings which are the most reliable sources of evidence. Other evidence may include urine splashes, feeding remains (such as moth wings) or odour, however these latter examples should not be relied on in isolation to confirm presence. The results of the PRA are detailed in Appendix B. Buildings were then classified in line with best practice guidance⁸.
- 2.2.5. The buildings were assigned to one of the following suitability categories according to its features, as described in Table 2-1 below.

Table 2-1 – Guidelines for assessing suitability of structures⁹

Suitability	Description – Roosting Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices / suitable shelter at all ground / underground levels).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ¹⁰ and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool / stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ¹⁰ and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ¹⁰ and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity of classic cool/ stable hibernation site.

⁵ Assessment undertaken by AtkinsRéalis ecological technical leadership team in accordance with CIEEM competency criteria.

⁶ <https://www.cieem.net/competency-framework>.

⁷ <https://www.gov.uk/government/publications/bats-survey-or-research-licence-level-2>.

⁸ Collins, J. (ed.) (202316) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th 3rd edition). The Bat Conservation Trust, London.

⁹ Table reproduced from good practice survey guideline⁶, Table 4.1.

¹⁰ For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

Automated Hibernation Surveys

- 2.2.6. Two Song Meter 4 (SM4) automated static bat detectors were positioned within Bedhampton 1 during the hibernation season within the Training Room and M & E Store, where suitability for hibernating bats was identified. The location of the static detectors can be seen in Appendix C.
- 2.2.7. The detectors were set to record bat activity on 30/01/2024 until they were collected on 28/02/2024, for a total period of 29 days.
- 2.2.8. No detectors were positioned within Bedhampton 2 and the Pumping Station of Bedhampton 1 due to lack of internal access to the roof void.

Ground Level Tree Assessment

- 2.2.9. The trees on site were subject to a GLTA on 29/11/2023. PRFs suitable for roosting bats subject to further survey shown in Appendix D with the location of trees is shown in Appendix E.
- 2.2.10. Trees were inspected from ground level, using binoculars and high-powered torches where appropriate during daylight hours to look for Potential Roost Features (PRF's) such as rot holes, cracks, splits, or woodpecker holes that could potentially be used by roosting bats.
- 2.2.11. Each tree was assigned an initial category in line with the best practice guidance at the time which was subsequently updated to be in line with the current best practice guidance and professional judgement as presented in Table 2-2 below. The roosting potential attributed at this stage is considered an estimate until PRFs are inspected in detail.

Table 2-2 – Guidelines for assessing suitability of trees for bats

Original Category ¹¹	Updated Category ¹¹	Description
Low	PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
Medium or High	PRF-M	PRF is suitable for multiple bats and therefore may be used by a maternity colony.

- 2.2.12. Trees with potentially suitable PRFs were then recommended for further surveys to verify the potential suitability of each individual PRF to support bats.

Bat Presence / Likely Absence Surveys

Structures

- 2.2.13. In order to determine the potential use of the buildings on site by bats, presence / likely absence surveys were undertaken during the bat active season, between May and September 2024. The survey effort for each building was determined by the roosting potential assigned during the PRA, with the recommended survey requirement per suitability outlined in Table 2-3 below.

Table 2-3 – Guidelines for assessing survey effort of structures

Roost Suitability	Number of Surveys Required	Timings
Low	One dusk emergence	May to August (peak bat activity season)
Moderate	Two separate dusk emergence survey visits	May to September with at least one survey between May and August and surveys spread at least three weeks apart.
High	Three separate dusk emergence survey visits	May to September with at least two surveys between May and August and surveys spread at least three weeks apart.

¹¹ Collins, J. (ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edition). The Bat Conservation Trust, London.

- 2.2.14. Presence / likely absence surveys involve dusk emergence surveys to watch, listen for and record bats. The method involves the use of bat detectors and infra-red cameras to watch and record bats emerging from roosts to compile information on species, numbers, access points and roosting locations. Surveyors were positioned in strategic locations to provide maximum coverage of the buildings and PRFs. Surveyors were equipped with Batlogger M2 or Anabat Walkabout detectors to record bat calls for later analysis.
- 2.2.15. Infra-red (IR) cameras (Canon XA11, Canon XA55 and Sony Handycam FDR AX-33) were used on all surveys and were placed in strategic locations around the target buildings. The cameras were used to capture data where low light conditions would reduce surveyor visibility. The cameras were deployed with infra-red lamps to increase illumination of the buildings. A bat detector was also set up in association with the cameras to pick up any passing bat calls. Where IR cameras were used in place of a surveyor, these were within the eyeline of a surveyor and were checked regularly throughout the survey to ensure coverage.
- 2.2.16. Surveyor and camera locations can be seen in Appendix E.
- 2.2.17. The dusk emergence surveys commenced 15 minutes before sunset and lasted for 1.5 hours after sunset in order to record any bats that may emerge from the roost feature.
- 2.2.18. All bat passes, including time and species, were recorded. Where possible the behaviour of the bat was also recorded, including foraging, commuting or feeding behaviour.
- 2.2.19. The surveys were carried out in line with the current best practice guidelines with the dates, times and weather conditions for the surveys outlined in Table 2-4 below.

Table 2-4 – Timings and weather data for emergence surveys of structures

Building Name	Date	Sunset	Start / End time	Weather Conditions
Bedhampton 1	25/06/2024	21:16	21:01 – 22:46	22°C, 1/8cc, B2, no rain
	26/06/2024	21:21	21:06 – 22:51	22°C, 0/8cc, B1, no rain
	22/07/2024	20:03	20:48 – 22:33	18°C, 8/8cc, B4, no rain
	28/08/2024	19:57	19:42 – 21:27	22°C, 7/8cc, B1, no rain
Bedhampton 2	26/06/2024	21:21	21:06 – 22:51	22°C, 0/8cc, B1, no rain
	23/07/2024	21:02	20:47 – 22:32	23°C, 8/8cc, B1, no rain
	29/08/2024	19:55	19:40 – 21:25	22°C, B2, no rain

Trees: Emergence surveys

- 2.3. In line with current guidance, where a tree cannot be subject to close inspection safely, then emergence surveys should be undertaken to establish presence / likely absence of bats. The sycamore tree in G192¹² was assessed as being unsafe to climb as the tree was dead and therefore was subject to emergence surveys. The oak tree in G192 was safe to climb in parts, however other sections were considered less safe, and the PRFs could not be fully inspected. Therefore, emergence surveys of this tree were undertaken in conjunction with the climbs.
- 2.4. Emergence surveys of trees follow the same methods as those for structures. During the surveys, surveyors were positioned around the tree to provide suitable coverage. A combination of IR and thermal cameras were used (Sionyx Auroura and Pulsar Axion Thermal Camera) alongside handheld bat detectors (Echo Meter Touch) which were used to record calls for later analysis.
- 2.4.1. The surveys were carried out following the current guidelines. The dates, times and weather conditions during the surveys are provided in Table 2-5.

¹² Atkins (2024). ES Vol 4 – Appendix A9 – A9.18 Pipeline Arboricultural Impact Assessment.

Table 2-5 – Timings and weather data from tree emergence surveys

Tree Number	Date	Sunset (hrs)	Start and End Times	Weather Conditions
G192	10/08/2024	20:33	20:05 – 22:05	22°C, B2 ¹³ , no rain
G192	31/08/2024	19:50	19:20 – 21:20	20°C, B1, no rain
G192	24/09/2024	18:56	18:30 – 20:30	17°C, B2, light shower prior to survey

Trees: Potential Roost Feature Inspection Surveys

- 2.4.2. Where trees were assessed as having PRFs during the GLTA and were safe to climb, aerial PRF inspection surveys were undertaken. The inspection surveys aim to inspect the tree for the presence of, or evidence of, bats and verify the suitability of the feature. The categories for classification are detailed in Table 2-2.
- 2.4.3. PRFs were inspected using torches, mirrors and an endoscope (PCE300 5mm 3m Extension Endoscope). During the inspection, information on the individual PRFs will be recorded including dimensions, internal conditions, any evidence observed, protection from the elements etc.
- 2.4.4. The surveys were undertaken by suitably licensed surveyors who are NTPC CS38 Aerial tree climbing and rescue certified.
- 2.4.5. Where PRFs were verified as PRF-I following the initial climb, no further surveys were required, however mitigation and compensation still applies. Where PRFs were assigned PRF-M, three presence / likely absence survey visits were undertaken during the active season (May to September inclusive), with at least two between May and August. Climbs of the same tree / PRF were spaced at least three weeks apart.

Sound Analysis

- 2.4.1. Following the survey all sound files recorded by each surveyor were analysed using Kaleidoscope software to identify the bats recorded to species-level (where possible).
- 2.4.2. All files were initially processed using automatic identification (auto-ID) software. All files identified by the auto-ID software as a bat call, and 10% of files identified as noise (determined by random sampling) were subsequently checked by a suitably qualified and experienced ecologist. The identification of bats from the sound files was undertaken to genus / species level using key call parameters, following good practice guidance.
- 2.4.3. Following the initial analysis (auto-ID and checks), 10% of common pipistrelle and soprano pipistrelle calls (determined by random sampling) and 100% of all other bat species calls were subject to a quality assurance review by a suitably qualified and experienced ecologist.

Infrared Camera Review

- 2.4.4. The camera footage recorded during the surveys was watched in full for the presence of imagery of emerging bats and potential bat emergences, with the video timings and recorded activity noted in a spreadsheet for review. All sections of videos where emergences or potential emergences were flagged were then subject to a check undertaken by a suitably qualified ecologist to confirm or rule out roosting bats within that building. The check also undertook a spot check of the videos to assess likelihood of missed emergences in the initial check. A final review of all confirmed or potential emergences was then undertaken by a suitably qualified ecologist.

¹³ Beaufort wind force scale used to describe intensity of wind.

2.5. Limitations

- 2.5.1. A desk study for the Pipeline Scheme was undertaken on 15/02/2023¹⁴. An updated data request to HBIC for recent bat records within 2 km of the Site has not been undertaken, therefore there may be missing records of bats within the last year. This is not considered to be a major limitation to the assessment due to the targeted nature of the surveys.
- 2.5.2. The surveyors could not gain access to the roof void in Bedhampton 1 Pumping Station or Bedhampton 2 due to both buildings having a sealed ceiling / roof void. No automated static detectors were therefore left within these voids. Due to the likelihood of recording data from external foraging or commuting bats, and the risk of theft, no detectors were left on the building exterior.
- 2.5.3. During the PRA surveyors could not fully assess the buildings internally due to the limitation outlined above and due to the presence of a suspended ceilings within the M & E Store and the Training Room of Bedhampton 1. Approximately 80% of the M & E store and 60% of the Training Room was covered by the suspended ceiling and a full inspection of this was not possible. It is therefore considered that droppings may not have been seen where present in certain sections. Due to the conduction of three dusk emergence surveys, this is not considered to be a limitation.
- 2.5.4. Automated surveys were undertaken where possible (M & E Store and Training Room) due to the size and nature of the rooms and limited access.
- 2.5.5. The extent of the hibernation surveys was not considered suitable to provide conclusive evidence of the use of Bedhampton 1 by bats, as the surveys were not in line with best practice guidelines which recommends the deployment of statics during autumn, winter and early spring. However, due to the suitability of the building for hibernating bats, hibernation is assumed.
- 2.5.6. During the first emergence survey of Bedhampton 1, IR camera SPY-07 failed to record due to an error with the SD card. Another camera (SPY-09) was placed in the same location on the following night during the emergence survey of Bedhampton 2 to cover the aspects of the building SPY-07 failed to record. The camera failure is therefore not considered a limitation.
- 2.5.7. Due to a data uploading error, all recordings from the detectors were lost for the survey undertaken of Bedhampton 2 on 26/06/2024. This is not considered to be a constraint to the surveys as no bats were observed emerging during these surveys and there were further surveys of this building and the adjacent trees which recorded data on the species composition present at the site.
- 2.5.8. Ecological surveys are limited by factors which affect the presence of animals such as the time of year, migration patterns and behaviour (including the highly mobile nature of bats). Therefore, the absence of evidence of any species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.
- 2.5.9. The above limitations have been addressed through following a precautionary approach within this report and suitable recommendations are provided in advance of works commencing.
- 2.5.10. A number of UK bat species (e.g. brown long-eared) produce quiet calls that are directional and not always detected by the equipment, these species are likely to have been under-recorded during activity surveys.
- 2.5.11. It is not usually possible to identify calls from *Myotis* or *Plecotus* genus to species level using acoustic analysis alone^{15,16}.
- 2.5.12. Identification was undertaken taking account of the entire call structure. Where there is significant overlap of call structure between multiple species, the peak frequency and degree of frequency modulation of the call is used to broadly aid in the categorisation/identification of species. Calls that could not be distinguished between Nathusius', common and soprano pipistrelle were assigned as 'Pipistrelle sp.' For pipistrelle identification, the peak frequency 'aid' is as follows:
 - Soprano pipistrelle– Above 51kHz

¹⁴ AtkinsRéalis (2024). Environmental Statement Volume 4: Appendix A9 - A9.16 Pipeline Ecological Update

¹⁵ Parsons, S. and Jones, G. (2000). *Acoustic Identification of Twelve Species of Echolocating Bat By Discriminant Function Analysis and Artificial Neural Networks*. Journal of Experimental Biology. 203: 2641-2656.

¹⁶ Walters, C. et. al. (2012). *A continental-scale tool for acoustic identification of European bats*. Journal of Applied Ecology. 49: 1064-1074.

- Pipistrelle species – Between 49kHz and 51 kHz (inclusive)
- Common pipistrelle– Above 40kHz and below 49 kHz
- Pipistrelle species – Between 39kHz and 40kHz (inclusive)
- Nathusius' pipistrelle – Below 39kHz

- 2.5.13. This process of using peak frequency and frequency modulation as a rough aid in categorising calls also applies for noctule and Leisler's bat. The quasi-constant frequency calls was also used to measure peak frequency, rather than the frequency modulated calls. Calls that could not be determined between noctule and Leisler's bat were assigned as '*Nyctalus* spp'. Where there was uncertainty over whether calls were from '*Nyctalus* spp' or serotine (*Eptesicus serotinus*), these calls were grouped as 'big bat'. The classification of 'big bat' is used where there is significant similarity between *Nyctalus* species and serotine call structures, such that they cannot be distinguished with confidence. For example, where noctules and Leisler's are in clutter, their call structure is altered, often making them difficult to not only distinguish within the *Nyctalus* genus, but also from serotine.
- 2.5.14. Peak frequency is used to aid in identification (not to guide it), and other aspects of the call are taken into account. Using the parameters above also ensures consistency of identification throughout the whole team.
- 2.5.15. The Future Water designs for the buildings at Bedhampton Pumping Station are still in draft format and as such, any future changes to the proposed design may result in a requirement for further surveys or changes to the proposed mitigation and compensation.

3. Results

3.1. Desk Study

- 3.1.1. HBIC provided 751 recent bat records, comprising 11 species of bat, three genus and two records to *Chiroptera* only, within 2 km of the Site. The records possess four-figure or six-figure grid references and, therefore, it is not possible to accurately confirm where these records are located in relation to the Site. However, based on the approximate locations provided by the grid references, six records are potentially located within the Site and comprise records of three common pipistrelle, one soprano pipistrelle and two *Myotis* spp.
- 3.1.2. The total records of each species are as follows:
- 6 records of brown long-eared;
 - 299 records of common pipistrelle;
 - 6 records of Daubenton's bat;
 - 6 records of long-eared sp.;
 - 43 records of *Myotis* sp.;
 - 21 records of Nathusius's pipistrelle;
 - 9 records of Natterer's bat;
 - 53 records of noctule;
 - 10 records of *Pipistrellus* sp.;
 - 76 records of serotine;
 - 211 records of soprano pipistrelle;
 - 2 records of unidentified bat species;
 - 3 records of barbastelle;
 - 1 record of greater horseshoe; and,
 - 5 records of Leisler's bat.
- 3.1.3. A search on MAGIC returned one granted EPS licence pertaining to bats within 2 km of the Site. The licence was located approximately 50 m east of the Site and was granted for the destruction of a common pipistrelle resting place in 2014.
- 3.1.4. Additionally, an EPS licence for bats is currently in place for the adjacent Havant Thicket Reservoir Scheme, which is under construction (2020-50625-EPS-AD2-4), located approximately 2.6 km north of Shaft 1. A total of 36 bat roosts were recorded during the enabling works for Havant Thicket Reservoir, comprising 32-day roosts from a total of six species¹⁷, three maternity roosts from a total of two species¹⁸ and one mating roost¹⁹.

Previous Survey Work

- 3.1.5. Hampshire and Isle of Wight Wildlife Trust undertook a PRAs of Bedhampton 1 and 2 in 2014. The M & E Store section of Bedhampton 1 was assessed as having high potential to support roosting bats²⁰, with the Training Room section assessed as having low potential to support roosting bats²¹. Bedhampton 2 (Pumping Station 2 as per referenced reports) was assessed as having low potential to support roosting bats²².

¹⁷ Bechstein's, brown long-eared, common pipistrelle, Daubenton's, Natterer's and noctule.

¹⁸ Brown long-eared and Natterer's.

¹⁹ Noctule.

²⁰ Hampshire and Isle of Wight Wildlife Trust (2014). Phase 1 Bat Survey: Bedhampton Pumping Station (M & E Store).

²¹ Hampshire and Isle of Wight Wildlife Trust (2014). Phase 1 Bat Survey: Bedhampton Pumping Station (Training room).

²² Hampshire and Isle of Wight Wildlife Trust (2014). Phase 1 Bat Survey: Bedhampton Pumping Station (pumping station 2).

- 3.1.6. Three nocturnal surveys, two dusk emergence surveys and one dawn re-entry survey was undertaken on the M & E building of Bedhampton 1 between June and September 2015²³. A single common pipistrelle was recorded emerging from the western end of the southern aspect from behind the top of the drain during the surveys. The survey concluded that the roost is likely utilised as a day roost by low numbers of common pipistrelle bats. An updated pre-commencement of works survey was undertaken in 2016 by Arcadian Ecology and Consulting Ltd for a separate scheme and determined that the roost status hadn't changed²⁴. No nocturnal surveys of the training room section of Bedhampton 1 were undertaken at this time.
- 3.1.7. A single emergence survey was undertaken on Bedhampton 2 in August 2014 with no bats recorded emerging from the building during the survey²⁵.

3.2. Field Surveys

Preliminary Roost Assessment: Buildings

- 3.2.1. Two buildings were present within the site boundary at the time of the survey. These were identified as Bedhampton 1 and Bedhampton 2, the location of which can be seen in Appendix A. Photographs of the buildings and full details of potential features are provided in Appendix B with a summary of suitability outlined in Table 3-1 below.

Table 3-1 – Results of the Preliminary Roost Assessment

Building	PRF	Potential Suitability	Hibernation Potential	Further Surveys
Bedhampton 1	- Missing tiles - Missing mortar - Gaps under tiles - Gaps in metal sheeting - Gaps in the brickwork and at the top of drainpipes leading to cavity wall - Gaps under bargeboards	High	Yes: Cavity wall present	Yes: hibernation surveys and three emergence surveys
Bedhampton 2	- Gaps under metal cladding - Gaps at vents / drains where mesh is absent - Cavity under window seal	Moderate	Yes	Yes: Two emergence surveys increased to three due to roof void being inaccessible to surveyors and the proposed impacts

- 3.2.2. No bats were recorded at the time of the survey with no bat droppings found during the survey.
- 3.2.3. Although Bedhampton 2 was assessed as being of moderate potential for bats, due to having a roof void that was inaccessible to surveyors and the anticipated impacts to the building (demolishing of the single storey section and extension of the roof) a precautionary approach was applied, and the building was subject to three dusk emergence surveys.
- 3.2.4. Both buildings were assessed as having suitable hibernation potential for bats.

Automated Hibernation Surveys

- 3.2.5. As hibernating bats can be difficult to find, static detectors were placed within Bedhampton 1. One detector was placed within the M & E Store (S1) and one detector was deployed within the training room (S2). The location of the detectors can be seen in Appendix C.

²³ Jackson, S. (2015). Phase 2 Bat Survey: M & E Store, Bedhampton PS, Portsmouth Water 2015. Hampshire and Isle of Wight Trust, Hampshire.

²⁴ Jackson, S. (2016). Method statement: M & E Store, Bedhampton PS, Portsmouth Water. Arcadian Ecology & Consulting Ltd, Curdridge.

²⁵ Hampshire and Isle of Wight Wildlife Trust (2014). Phase 1 Bat Survey: Bedhampton Pumping Station (pumping station 2).

- 3.2.6. The detectors were deployed on 30/01/202 until 28/02/2024, recording for a total of 29 days.
- 3.2.7. A single common pipistrelle call was recorded on Static 2 (S2) on 2nd February 2024 at 18:28. No calls were recorded on Static 1 (S1).
- 3.2.8. No statics were deployed in Bedhampton 2 due to the roof void being inaccessible.

Presence / Likely Absence Surveys: Buildings

- 3.2.9. Both of the buildings on site were subject to three emergence surveys over the bat activity season (May to August inclusive) with two surveys on each of the buildings being undertaken between June and July, the main maternity period for bats. This increases the likelihood of detecting a maternity roost should they be present. The results of the surveys are summarised for each building below.

3.2.10. Bedhampton 1

- 3.2.11. Two pipistrelle bats were recorded emerging from around the drainpipe towards the south-west end of the south-east aspect of the building (Training Room) on the survey undertaken on 26/06/2024. The bats emerged at approximately 21.54, 33 minutes after sunset. The bats emerged in quick succession, flying west towards the trees and river.
- 3.2.12. No bats were recorded emerging from the buildings on any other surveys.
- 3.2.13. Bedhampton 1 is therefore considered to be a confirmed pipistrelle day roost. Due to the suitability of the building and the single recording of a common pipistrelle during hibernation surveys it is considered likely the building is used for hibernation by small numbers of bats.
- 3.2.14. The roost was assessed in line with current criteria²⁶ for assessing the importance of a bat roost and was considered to be of site level importance due to the species present being considered widespread across all geographies and the roosts encountered being non-breeding day roosts (small number of individual bats).

Bedhampton 2

- 3.2.15. No bats were recorded emerging from the building during any of the surveys. The building is therefore not considered to support roosting bats at this time.

Ground Level Tree Assessment

- 3.2.16. Nine trees within the Site were considered likely to be subject to impacts as a result of the scheme. The trees were subject to a GLTA on 29/11/2024 with three of the nine trees considered to have suitable PRFs for roosting bats. The location of these three trees can be seen in Appendix A, with the results of the GLTA shown in Table 3-2 below. Images of the PRFs can be seen in Appendix D. The trees are numbered in line with the Arboricultural report²⁷ for the site.
- 3.2.17. The remaining six trees were considered to have negligible potential for roosting bats.

Table 3-2 – Results of the Ground Level Tree Assessment

Tree Number	Species	Feature Number, Height and Orientation	PRF	Estimated Suitability	Further Surveys
T191	Scot's pine	F1: 12m, W	Hazard beam with numerous small locations suitable for multiple roosting bats	PRF-M	Climbing surveys

²⁶ Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

²⁷ Atkins (2024). ES Vol 4 – Appendix A9 – A9.18 Pipeline Arboricultural Impact Assessment.

Tree Number	Species	Feature Number, Height and Orientation	PRF	Estimated Suitability	Further Surveys
G192	Sycamore	F1: 1.5m – 4m, SE	Very large cavity starting at 15m above ground level, with a split on the north-west and south-eastern face of the main trunk. There are multiple chambers and splits within this cavity that potentially could be used by large numbers of bats to roost	PRF-M	Evening Emergence Survey
G192	Oak	Multiple Features at Multiple Heights.	Multiple cavities were present throughout the length of this tree, with woodpecker holes, splits, cankers and lifting bark	PRF-M	Climbing and Emergence Survey

Potential Roost Feature Inspection Surveys

- 3.2.18. Two of the trees were subject to climbed inspection surveys between 10/08/2024 and 24/09/2024. The climbed surveys resulted in the change in assessment for the hazard beam feature on T191, with the assessment being reduced from PRF-M to PRF-I. A new feature was also encountered on T191 during the climbed surveys. This was a woodpecker hole and was assessed as being PRF-M. The assessment of the oak in G192 remained the same following the climbed inspections.
- 3.2.19. No bats were recorded roosting within any of the features during the climbed surveys. The results of the surveys are outlined in Table 3-3 below.
- 3.2.20. The sycamore in G192 was assessed as being unsafe to climb as the tree was dead and therefore was subject to emergence surveys. The oak in G192 was safe to climb in parts, however other sections were considered less safe, and the features PRFs could not be fully inspected, therefore emergence surveys of this tree were undertaken in conjunction with the climbs.

Table 3-3 – Results of the Roost Feature Inspection Surveys

Tree Number	Species	Feature Number, Height and Orientation	PRF	Verified Suitability	Result
T191	Scot's pine	F1: 12m, W	Hazard beam with numerous small locations	PRF-I	No bats recorded present; suitability of hazard beam reduced from PRF-M to PRF-I. New PRF-M feature discovered.
		F2: 15m, N	New woodpecker holes at 15m facing north. Ingress into tree approximately	PRF-M	

Tree Number	Species	Feature Number, Height and Orientation	PRF	Verified Suitability	Result
			20cm, with further progress into tree upwards noted on the second survey. Likely to be able to support bats at PRF-M		
G192	Oak	Multiple Features at Multiple Heights.	Tree was heavily diseased with large areas of deadwood. Multiple cavities were present throughout the length of this tree, with woodpecker holes, splits, canker and hanging bark. This tree was also directly adjacent to a watercourse and therefore this tree could potentially support large numbers of multiple species of bat.	PRF-M	No bats recorded present; suitability remains as assessed during the GLTA Note emergence survey also required as tree could only be partially inspected

Presence / Likely Absence Surveys: Trees

- 3.2.21. Emergence surveys of two trees (T191 and the oak in G192) proposed for impacts were undertaken during the survey season in 2024. The trees were both assessed as PRF-M and were subject to three separate emergence surveys in line with current guidance.
- 3.2.22. No bats were recorded emerging from any of the features identified on either of the trees during the surveys.

Foraging and Commuting

- 3.2.23. Activity during the surveys was generally low with multiple passes attributed to the same bats. Four species of bat, one genus and one group (big bats) were recorded during the surveys:
- Common pipistrelle;
 - Soprano pipistrelle;
 - Noctule;
 - Daubenton's bat;
 - Big bat species; and
 - *Myotis* species.
- 3.2.24. The majority of the activity during the emergence surveys of the trees was associated with the watercourse to the west of the trees.
- 3.2.25. The species composition present at the site was assessed in line with current guidelines with the site considered to be of importance on the site level only (calculation breakdown: 3 + 4 + 3 + 4=

14²⁸). The calculation was made on a precautionary basis to include Grey Long Eared bats as their distribution is known to include the very southern coast of England²⁹.

4. Summary and Recommendations

4.1. Summary

- 4.1.1. The recommendations outlined below are based on the current scope of works proposed for the buildings at Bedhampton³⁰ which are outlined in more detail in Section 4.1.3 and 4.1.9 below. Where any changes to the scope occur, a bat licensed ecologist should be consulted, and a European Protected Species Licence or Bat Disturbance Notification may be required.
- 4.1.2. The emergence surveys undertaken on Bedhampton 1 confirmed the presence of a pipistrelle day roost located behind the top of the drain on the south-west end of the south-east aspect. This area of the building (Training Room) is connected to the section of the building where works are proposed (M & E Store) through a small connecting corridor only. The sections of the buildings do not have connection walls or roof sections. It is therefore considered unlikely the works proposed to the M & E Store would negatively impact roosting bats on the Training Room.
- 4.1.3. The works proposed to the M & E Store currently include the installation of a turbidity system for shaft 1, the installation of a new generator plan and switch board, the replacement of two doors, and cabling ran through an existing duct. There may also be a requirement for works to the suspended ceiling within this section of the building, however the final details for this are unconfirmed.
- 4.1.4. No bats were recorded emerging from the M & E Store during the surveys, however, as this building is a historical roost, it is recommended the works are conducted under a Precautionary Method of Works (PMW). Further details are outlined in Section 4.2 below.
- 4.1.5. The hibernation surveys of Bedhampton 1 detected one common pipistrelle call on the static detector deployed in the Training Room. The hibernation surveys were not sufficient to confirm the presence of hibernating bats, however, given the recording of bat call, the use of the building for hibernation is assumed. A hibernation roost for common pipistrelle bats is considered to be of site level importance in line with the assessment criteria outlined in the Bat Mitigation Guidelines³⁵ for assessing importance of a roost. It is considered that under the proposed works, no impacts to a hibernation roost in the Training Room section of Bedhampton 1 would be incurred as a result of the works.
- 4.1.6. It was considered that the M & E Store where the works are proposed has a cavity wall. It is considered unlikely that common pipistrelle (historical confirmed roost) would be present within the cavity walls, and therefore works to these walls for the installation of new doors is considered unlikely to result in impacts to hibernate bats. However, as the building has the potential to support hibernating common pipistrelle measures should be taken to avoid the hibernation period where bats are at their most vulnerable. Mitigation is outlined in Section 4.2
- 4.1.7. Three trees adjacent to the north western aspect of Bedhampton 1 will be removed to facilitate the works. Three trees around Bedhampton 2 will be removed as well. These six trees were subject to a GLTA and were not considered to have features suitable for roosting bats.
- 4.1.8. No bats were recorded emerging from Bedhampton 2 during the surveys. It is therefore considered that Bedhampton 2 is not currently used by roosting bats.
- 4.1.9. Under current proposals, works to Bedhampton 2 will include the demolition of the brick built lean to section of the building on the south-eastern side of the building. This will then be rebuilt to the height of the main building, with the existing roof extended across to cover the new section of building. A new transformer, fenced enclosure, compressor kiosk and vessel surge will be added

²⁸ Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield.

²⁹ Natural England. (2021). Definition of the Favourable Conservation Status for the Grey long-eared bat, *Plecotus austriacus*. Natural England.

³⁰ Detailed on drawing numbers: HTR-BRD-PS-B2-DR-M-2011; HTR-BRD-PS-B2-DR-M-2012; HTR-BRD-PS-B2-DR-M-2013; HTR-BRD-PS-B2-DR-M-2015; HTR-GHD-PZ-B1-DR-S-0001, shared with AtkinsRéalis in November 2024.

externally adjacent to the building. Therefore, it is considered the works to Bedhampton 2 would cause significant disturbance to roosting bats in the unlikely event they were present.

- 4.1.10. Due to the presence of suitable features for roosting bats, the proximity to a confirmed roost, the known frequency with which bats can change roosts and the inability to access the roof void, it is recommended that works to Bedhampton 2 be conducted under a PMW. This is detailed further in Section 4.2.
- 4.1.11. No bats were recorded during the PRF inspection surveys of T191 and the oak in G192.
- 4.1.12. No bats were recorded during the emergence surveys of the sycamore or oak in G192.
- 4.1.13. It is therefore considered that these trees do not currently support roosting bats. Due to the frequency with which bats change roosts, precautionary measures should be employed during the removal of these trees as outlined in Section 4.2 below.
- 4.1.14. A total of four species, one genus and one group of bats were recorded during the surveys these were:
 - Common pipistrelle;
 - Soprano pipistrelle;
 - Noctule;
 - Daubentons;
 - *Plecotus* species; and
 - Big bat.
- 4.1.15. Overall, the activity levels recorded during the surveys was low, with most of the activity recorded around Bedhampton 2 and the trees, suggesting bats are utilising the treeline and river corridor for foraging and commuting. The species composition of the site was considered to be of site level importance only.
- 4.1.16. Bats are adapted to forage and commute in low light conditions. Any increases to the lighting levels currently present on site may negatively impact the foraging and commuting routes of bats and their roosts. It is understood that both temporary and permanent lighting will be required at the site as part of the construction and operational phases of the scheme. Recommendation to avoid impacts to foraging and commuting bats are outlined in Section 4.2.

4.2. Mitigation and Recommendations

- 4.2.1. The works to Bedhampton 1 are considered unlikely to cause disturbance to the existing bat roost and therefore can be undertaken under a PMW, subject to final details on the ceiling works. The PMW will cover suitable timings for the works, suitable methods to be used during the works and actions to take in the unlikely event a bat is encountered during the works. The PMW will also detail the requirement for the presence of a bat licensed ecologist and a toolbox talk to be delivered to all contractors prior to the commencement of works. As the building has been assessed as having suitable hibernation habitat for common pipistrelles, it is recommended the works avoid the hibernation period for bats (November to March, temperature dependant).
- 4.2.2. Although no roost was recorded within Bedhampton 2, due to the presence of suitable roosting features, the proximity of the building to a confirmed roost, suitable adjacent habitat and bat activity in the area, it is recommended that the works to the building are undertaken under a PMW as detailed above.
- 4.2.3. It is recommended that integrated bat boxes are installed on the newly constructed section of Bedhampton 2 to provide an enhancement for local bat populations. Details for locations, specifications, positioning and management will be detailed in an Ecological Management Plan (EMP) for the site.
- 4.2.4. Any trees proposed for removal which were not subject to further surveys in 2024 should be subject to an updated GLTA prior to removal due to the elapsed time between the original assessment (November 2023) and the commencement of the proposed works (2026). The GLTA will detail any changes in potential on the trees. Where trees are considered to have developed features suitable for roosting bats, further assessment will be required prior to felling.

- 4.2.5. Bat move between tree roost regularly³⁴ and therefore could occupy any of the PRFs identified within the trees on site at any time. In order to prevent impacts to bats, the PMW implemented for the site will include details for the safe removal of trees. The PMW will outline any pre-commencement checks required, supervision requirements, toolbox talks, methods of works and timings of works. If bats are recorded at any point during the works on site, a European Protected Species (EPS) licence may be required to lawfully continue with the works.
- 4.2.6. Pre felling checks on all trees with identified potential roost features should be undertaken by a bat licensed ecologist through a combination of aerial assessment, nocturnal surveys or inspection from Mobile Elevating Work Platform (MEWP) as required.
- 4.2.7. Following inspections, trees with no roosting bats present can be felled using suitable felling techniques which will be outlined in the method statement. The likely methodology for this is summarised below:
- Felling work should be undertaken during weather conditions in which bats will be expected to be active. The hibernation period (November to March) should be avoided to minimise the risk of significant disturbance.
 - A suitably qualified and bat licenced ecologist with appropriate experience should be present on site to advise on felling methods and what to do in the event bats are encountered.
 - Any sections of the tree containing features suitable for roosting bats, i.e. woodpecker holes, lifted bark, cracks, knot holes, etc, should be carefully lowered to the ground, following which these sections should be subject to a detailed inspection by the supervising ecologist to confirm the absence of bats.
 - Subsequent to felling, all sections of the tree supporting features suitable for use by bats should be retained *in situ* for a period of 24 hours to allow bats to disperse, in the unlikely event that any are present but undetectable.
 - In the event that bats are encountered, all felling works on the tree should immediately cease and the supervising ecologist will advise on how best to proceed. If any injured bats are present, these will be taken into care. Natural England will be contacted for further advice if appropriate, and the need for licencing reconsidered.
- 4.2.8. Compensation for the loss of tree roosting resource at the site should be provided through the installation of bat boxes in suitable locations on retained trees. Boxes will target species most frequently detected on site (Pipistrelle species and noctule), with advice on specification, positioning, management and monitoring provided within the EMP for the site.
- 4.2.9. During the construction phase, works should seek to protect retained trees from damage, increased noise, vibration and lighting.
- 4.2.10. It is understood that lighting will be required at the site to facilitate temporary works and for the operational phase of the scheme. All lighting implemented at the site should be designed in consideration of the most current guidance on Artificial Light at Night (ALAN)³¹. During construction, where night works cannot be avoided, lighting should be angled away from the exterior of the buildings, this is essential where roosting bats have been confirmed. Semi-natural habitats such as trees, scrub and the river both on and off site, should not be illuminated by lighting to reduce impacts to foraging and commuting bats. Lighting for the operational phase of the development should be submitted for review by an ecologist prior to implementation of the scheme. Lighting should be avoided, then minimised and mitigated. Ensuring the specification minimises its impacts on bats, roost locations and access to them is not illuminated. All lighting should be on short times motion sensors to prevent unnecessary illumination.

4.3. Report Validity

- 4.3.1. In the event of scope or programme changes or if works do not commence within 12 months of the date of this report, then updates to the surveys may be required to ensure the validity of the data, as per Chartered Institute of Ecology and Environmental Management (CIEEM) guidance³².

³¹ Bat Conservation Trust (2023). Bats and Artificial Lighting at Night ILP Guidance Note GN08/23. BCT, London.

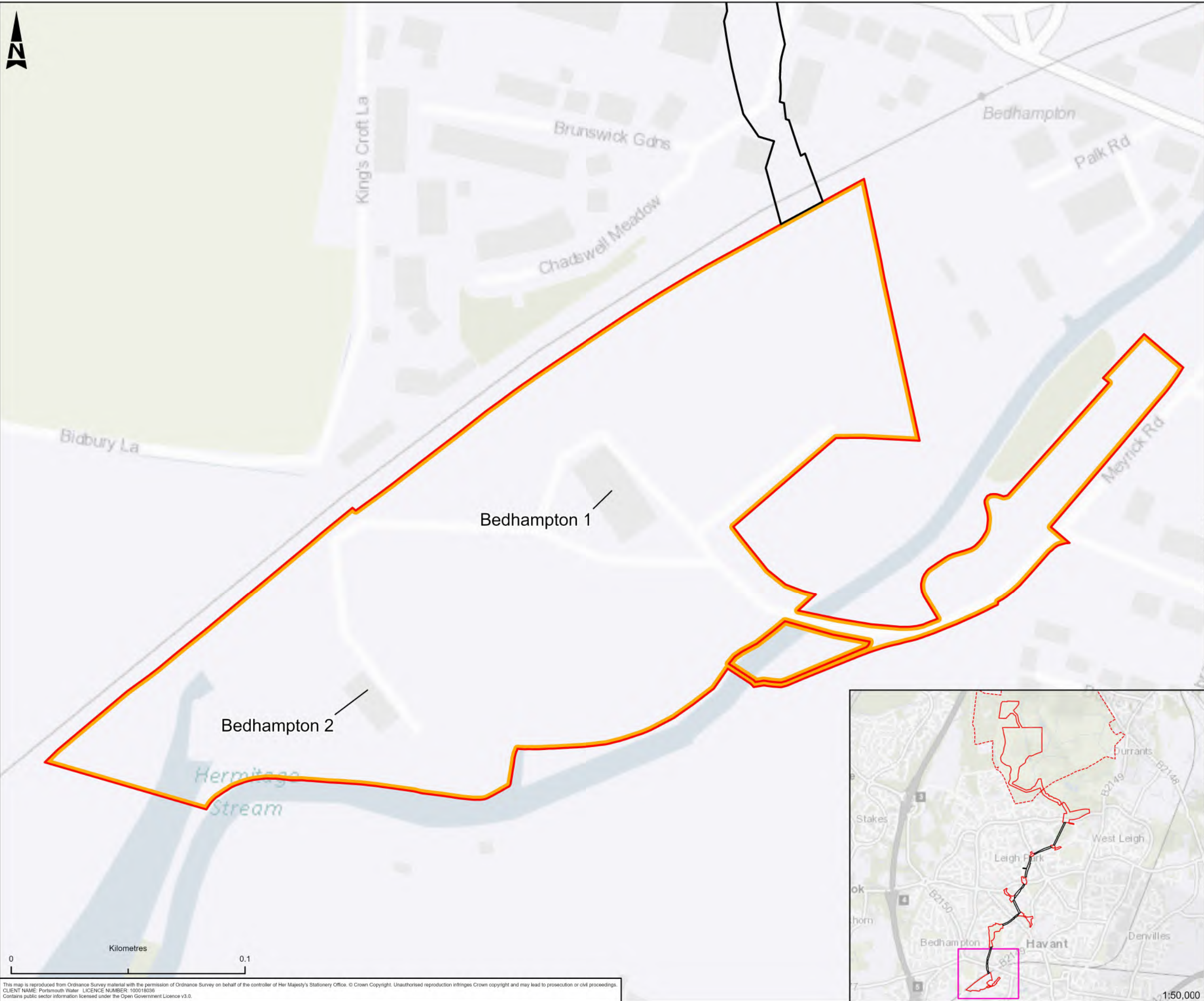
³² CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

Appendices



Appendix A. Site Location Plan

Figure A-1 – Site Location Plan



Site Boundary

Pipeline Scheme Red Line Boundary

Surface and Underground Works

Underground Works Only

Reservoir Red Line Boundary

C01	EN	EB	SC	JF	PUBLISHED	29/11/2024
Rev.	Drn By	Ckd By	Rev By	Auth By	Description	Date

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Drawing Suitability	Status
PUBLISHED	A1

Contractors Drawing Number:
HTR - ATK - ZZ - ZZ - GS - Z - XXXX
Project | Originator | Volume | Location | Type | Role | Number

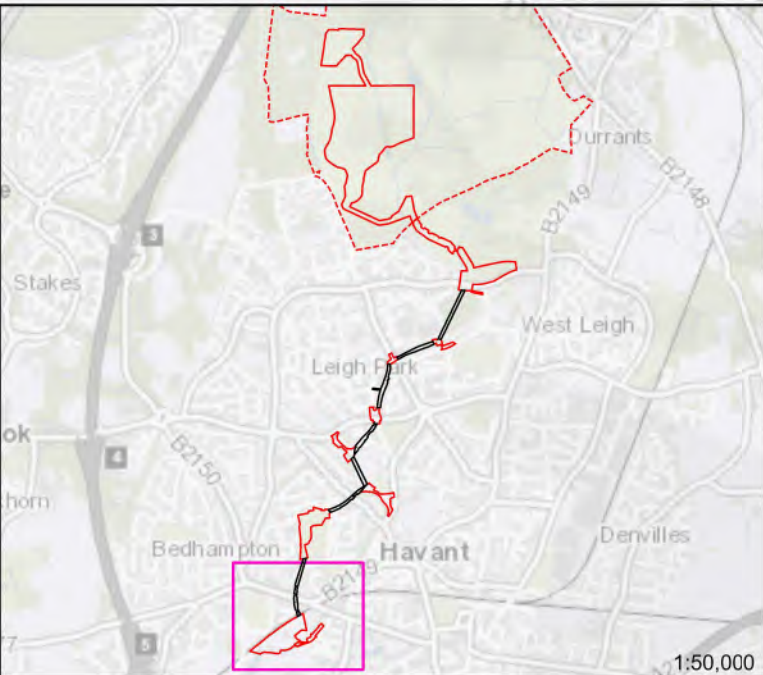
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Project Ref. No	Sheet	Scale	Sheet Size
5169117	1 of 1	1:1,500	A3

Project Title
HAVANT THICKET RESERVOIR

Drawing Title
**FIGURE A1
SITE LOCATION**

Portsmouth Water Drawing Number
Rev
C01



Appendix B. Preliminary Roost Assessment Results

Table B-1 – Preliminary Roost Assessment Results

Location	Description	Photo
Bedhampton 1 – External Assessment		
The Training Room	Lifted slate tiles that provide potential access points for bats Large gaps above the drainage pipes. Gaps under barge boards at the top of the walls that may provide access to bats into cavities.	 
The M & E Store	This building was previously confirmed as a common pipistrelle roost. Lifted slate tiles and gaps under roof boarding on the apex that provide potential access points for bats. Large gaps above the drainage pipes into inaccessible (to surveyors) cavities. Gaps under barge boards at the top of the walls that may provide access to bats into cavities.	

Location	Description	Photo
The Pumping Station	Missing hip tiles on the roof of this building, that may lead to gaps in the mortar providing access to bats. Gaps under roof tiles that bats may access.	 
The M & E Store	Potential entrance / exit point from gap behind drainage pipe. Emergence point of previous roost recorded here ³³ .	
The Pumping Station	Gaps under roof tiles potentially providing access points into roof void.	

³³ Hampshire and Isle of Wight Wildlife Trust (2014). Phase 1 Bat Survey: Bedhampton Pumping Station (Training room).

Location	Description	Photo
The Training Room and M & E Store	Potential roosting features between loose roof tiles and guttering, as well as loose bricks and cracks in external walls between the Training Room and M & E Store.	

Bedhampton 1 – Internal Assessment

The Training Room (eastern side)	The building was split internally into two rooms: the eastern and western rooms. The building interior had a timber / metal framework, with timber cladding directly beneath the roof tiles. There was potential for crevices between the roof tiles and cladding with occasional bat access points to the building interior visible. The eastern room is open to the roof void. Bottom photo shows setup of static detector.	 
----------------------------------	--	--

Location	Description	Photo
		
The Training Room (western side)	Suspended ceiling with occasional missing panels leading to open roof void. Occasional gaps into interior cavities from pipework.	
The M & E Store	Large roof void above partial suspended ceiling. The building interior has a timber / metal framework, with timber cladding directly beneath the roof tiles, there was potential for crevices between the roof tiles and cladding with multiple bat access points to the building interior visible.	

Location	Description	Photo
	The static detector was set up in the far-right corner of the room, with the microphone suspended in the roof void pointing into the centre of the roof void.	
The Pumping Station	Internally the building was considered to provide negligible suitability to support roosting bats with no obvious entrance / exit points or potentially suitable roost sites. No access to roof void was possible. Several loft hatches lead to small well sealed boxes for wiring.	

Bedhampton 2 – External Assessment

	Gaps under metal cladding on southern wall of Bedhampton 2, providing potential roosting site, or potential entrance / exit into roof void (inaccessible to surveyors).	
	Void between old and new roofs of Bedhampton 2, accessed via hole where drain cover mesh is missing on southern wall and cladding is damaged. There were several of these drainage gaps present on each elevation.	

Location	Description	Photo
	External pipe on Bedhampton 2 with evidence of disused birds nest inside, potential access point for bats, does not lead directly into interior of building.	

Bedhampton 2 – Internal Assessment		
	Single window with grill on the north-eastern elevation. A gap under the grill the length of the window on the north-eastern elevation was present and considered to offer access to bats. A cavity directly under the window was present. This feature was inspected with an endoscope and no evidence of bats was found at the time.	

Appendix C. Automated Hibernation Survey Locations

Figure C-1 – Bat Automated Hibernation Survey Locations



Pipeline Scheme Red Line Boundary

Surface and Underground Works

Underground Works Only

Bedhampton 1 Buildings

M&E Store

Pumping Station

Training Room

Bat Detector Location

★ S1, M&E Store

★ S2, Training Room

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Drawing Suitability

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Project Title

HAVANT THICKET RESERVOIR

Drawing Title

FIGURE C1
BAT AUTOMATED HIBERNATION
SURVEY LOCATIONS

Portsmouth Water Drawing Number

Rev

C01

Appendix D. Ground Level Tree Assessment Images

Table D-1 – Ground Level Tree Assessment Images.

Tree locations shown in Appendix E.

Tree Number	Image
T191	



Sycamore
G192



Oak G192



Appendix E. Surveyor Location Plan

Figure E-1 – Surveyor Location Plan



Pipeline Scheme Red Line Boundary

- Pipeline Surface and Underground Works
- Pipeline Underground Works Only

Bedhampton 1 Buildings

- M&E Store
- Pumping Station
- Training Room

Bat Surveyor Locations

- Surveyor
- ▲ IR Camera

Bat Feature

- Tree (T191 subject to climbed survey only)

CD1	EN	EB	SC	JF	PUBLISHED	29/11/2024
Rev.	Drawn By	Check By	Rev By	Auth By	Description	Date

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Project Ref. No	Sheet	Scale	Sheet Size
5169117	1 of 1	1:1,500	A3

Project Title

HAVANT THICKET RESERVOIR

Drawing Title

**FIGURE E1
SURVEYOR LOCATIONS**

Portsmouth Water Drawing Number	Rev
	C01

Appendix F. Emergence Location Plan

Figure F-1 – Emergence Location Plan



Pipeline Scheme Red Line Boundary

Pipeline Surface and Underground Works
 Pipeline Underground Works Only

Bedhampton 1 Buildings

M&E Store
 Pumping Station
 Training Room

Bat Emergence Locations

Emergence Location

CD1	EN	EB	SC	JF	PUBLISHED	29/11/2024
Rev.	Drawn By	Check By	Rev By	Auth By	Description	Date

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PUBLISHED		A1	

Contractors Drawing Number:
HTR - ATK - ZZ - ZZ - GS - Z - XXXX
Project | Originator | Volume | Location | Type | Role | Number

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Project Ref. No	Sheet	Scale	Sheet Size
5169117	1 of 1	1:1,500	A3

Project Title
HAVANT THICKET RESERVOIR

Drawing Title
**FIGURE F1
EMERGENCE LOCATIONS**

Portsmouth Water Drawing Number
C01

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