



Dŵr Cymru  
Welsh Water

# St Nicholas Wastewater Treatment Works Access Track Preliminary Ecological Appraisal Report

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Welsh Water

## Document control

St Nicholas WwTW Preliminary Ecological Appraisal Report				
Arcadis Consulting (UK) Ltd				
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## Executive Summary

This report presents the findings of a Phase 1 habitat and protected species walkover survey for the proposed temporary access track for the upgrading works at St Nicholas Wastewater Treatment Works (WwTW).

Due to recent and forecast population growth within the catchment area, and the identified requirement for a new ammonia consent for AMP 7, the treatment works requires an upgrade. The proposed works include the installation of distribution chambers, humus settlement tanks, trickling biofilters, de-sludge pumps, liquor return pumping stations, alkalinity dosing lines and kiosk. It has been identified that the current access track (Brook Lane) is too narrow to support the construction traffic and an alternative temporary access track from Dyffryn Lane to the east has been identified.

A desk study and field surveys were undertaken in May 2023. Habitats recorded within the survey boundary included improved grassland, semi-improved grassland, hedgerows, broadleaved woodland, occasional mature trees, scrub and a ditch.

These habitats have the potential to support nesting birds, roosting, foraging and commuting bats, Hazel dormouse, badger, reptiles, amphibians (during their terrestrial phase) and hedgehogs, with similar risks, constraints and mitigation required as those described for the main WwTW. In addition, this report has identified that the River Waycock and the Land adjacent to the River Waycock which is a Site of Interest for Nature Conservation and an area of restored ancient woodland are additional constraints to this part of the project.

Protected species surveys for Hazel dormouse and bat roosts in relation to the WwTW site have confirmed likely absence of Hazel dormouse and no bat roosts have been identified in trees likely to be impacted by the proposals. An arboricultural survey has been commissioned but not yet undertaken for both the WwTW site and the access track.

Good construction practices should be implemented as follows:

- Ancient woodland, trees and hedgerows are to be retained and protected including their rooting areas with the proposed access track passing through existing gateways where possible. Further details will be provided in the arboricultural report that has been commissioned;
- A sensitive methodology/programme of works should be adopted in relation to breeding birds, reptiles and amphibians if vegetation removal is identified at a later date;
- If works are undertaken over winter, the use of bog mats or similar should be considered especially in the wetter areas (e.g. grassland around Hedgerow H7);
- No night-time working to prevent harm to badgers and hedgehogs and disturbance of foraging/commuting bats;
- Pollution prevention measures to be in place with no refuelling undertaken along the access track and spill kits to be available at the main site compound; and
- Any damaged grassland to be re-seeded/re-instated once works are completed with species rich seed mixes where appropriate to ensure net benefit to biodiversity.

**Note: if the scope of works change, further surveys may be required, and the ecological impacts will need to be reassessed.**

## 1. Introduction

Arcadis Consulting (UK) Ltd undertook a Preliminary Ecological Appraisal (PEA) of the proposed temporary access track for the construction traffic required for the proposed upgrade to the St Nicholas Wastewater Treatment Works (WwTW). The objective of this report is to detail the results of the PEA and to outline recommendations for actions including further surveys if necessary.

### 1.1 Background

Arcadis Consulting (UK) Ltd (Arcadis) working as part of the Dŵr Cymru Welsh Water (DCWW) Capital Delivery Alliance (CDA) undertook a PEA at St Nicholas Wastewater Treatment Works (WwTW) access track (hereafter referred to as “the site”) (National Grid Reference: ST 08789 73303). The site is located south of St Nicholas village, Vale of Glamorgan, between Brook Lane and Dyffryn Lane. The site is surrounded by grazing pasture with hedgerow boundaries and small woodland blocks in the wider landscape. The nearest main road is the A48 located to the north of the site.

Upgrade works are required at St Nicholas WwTW. Arcadis has previously undertaken a Phase 1 habitat survey of the WwTW and the extension to its east and its immediate surroundings to understand any ecological constraints that may impact proposed construction activity; the details were reported in a separate PEA report<sup>1</sup>, a Dormouse Survey Report<sup>2</sup> and a Bat Tree Climbing Memo Report<sup>3</sup>. The requirement for a separate temporary access track has now been identified, and this is the focus of this report. The survey area is shown below in Figure 1.

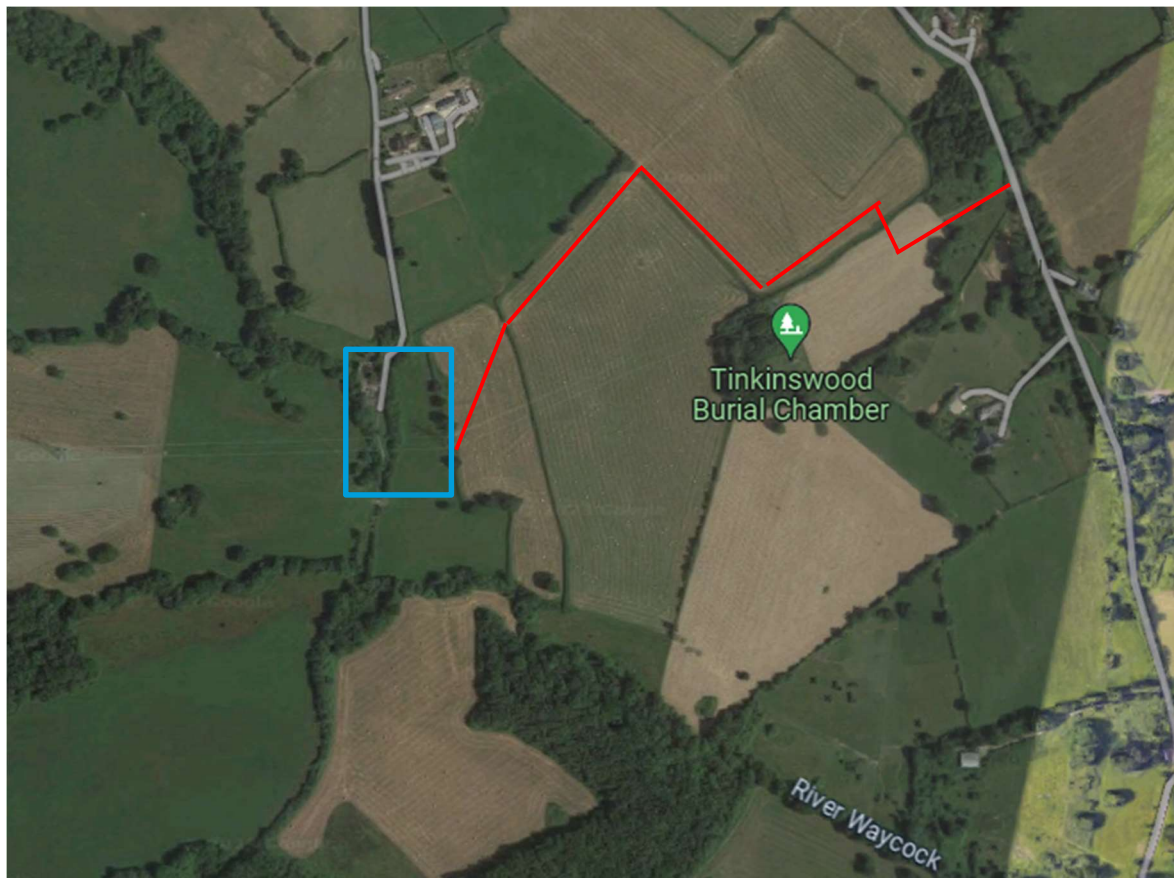


Figure 1: Aerial image of St Nicholas temporary access track (shown in red) and approximate location of WwTW works and extension (blue square).

<sup>1</sup> Arcadis (2022) St Nicholas Wastewater Treatment Works Ecological Constraints Memo (Doc Ref B10180-0AG964-ZZ-ZZ-RP-NA-ED0052)

<sup>2</sup> Arcadis (2023) St Nicholas Dormouse Survey Report

<sup>3</sup> Arcadis (2023) St Nicholas – Bat Tree Climbing Memo Report



## 1.2 Proposed work

Due to an increase in population and a change in consented discharge, the WwTW at St Nicholas requires an upgrade. An extension of the WwTW is to be undertaken into the field to the east of the existing works requiring a land purchase of approximately 4700m<sup>2</sup>.

To enable these works a temporary access track from the east is also required for construction traffic. This track will pass through existing gateways and there will be no loss of hedgerow habitat.

## 1.3 Purpose of the Report

The purpose of this report is to provide an initial assessment of the ecological importance of the habitats present within and immediately adjacent to the temporary access track and their potential to support protected or notable species.

This PEA has been written in accordance with the Guidelines for Preliminary Ecological Appraisal 2<sup>nd</sup> Edition (CIEEM 2017)<sup>4</sup>, the key objectives of a PEA are to:

- Identify the likely ecological constraints associated with a project;
- Identify any mitigation measures likely to be required, following the 'Mitigation Hierarchy'<sup>5</sup>;
- Identify the opportunities offered by a project to deliver ecological enhancement.

This report does not constitute an Ecological Impact Assessment (EclA).

## 2. Legal context and Policy Framework

The legal context for ecological survey is provided by a framework of international and domestic legislation which aims to protect specific sites, habitats, and species, to conserve biodiversity and promote the resilience of ecosystem services. This report and the assessment therein have been written in accordance with the following legislation, policy and guidance.

### 2.1 Protected sites

Statutory protected sites include:

- European Sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and the International Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention);
- National Sites (Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs)) protected under the Wildlife and Countryside Act 1981 (as amended); and
- Local Sites (Local Nature Reserves (LNRs)), protected under the National Parks and Access to the Countryside Act 1949 (as amended).

These sites are protected by the relevant legislation regardless of whether planning permission is required. Where planning consent is required, they will also be protected by Planning Policy.

Non-statutory sites including Country Parks, Local Wildlife Sites (LWS) including Sites of Importance for Nature Conservation (SINCs), and Ancient Woodlands are protected by Planning Policy, which will apply to

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<sup>4</sup> [Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-1.pdf \(cieem.net\)](#)

<sup>5</sup> The overarching aims of ecological work used to inform the planning process are to minimise harm and to maximise benefits for biodiversity resulting from development. The generally accepted way of doing this, now embedded within the planning system, is to follow the "mitigation hierarchy". This seeks, as a preference, to avoid impacts then to mitigate unavoidable impacts, and, as a last resort, to compensate for unavoidable residual impacts that remain after avoidance and mitigation measures (BS42020:2013 Biodiversity Code of Practice for Planning and Development. BSI Standards Limited 2013).

projects which require planning consent. Good practice would extend consideration of these sites to projects undertaken under permitted development rights.

## 2.2 Protected and Priority Species and Habitats

Statutory protected species include:

- European Protected Species (EPS) protected under the Conservation of Habitats and Species Regulations 2017 (as amended); and
- Nationally Protected Species, protected under the Wildlife and Countryside Act 1981 (as amended) (WCA), Protection of Badgers Act 1992, Countryside and Rights of Way Act 2000 (CRoW) and Salmon and Freshwater Fisheries Act 1975.

This legislation protects different species to varying degrees, and in most cases their habitats also, regardless of whether planning permission is required. In addition, these species are also afforded protection through Planning Policy, which requires that they are a 'material consideration' of any planning application.

Species and habitats of conservation concern which receive non-statutory protection (protection is via planning policy) include:

- Section 7 species and habitats listed in the Environment (Wales) Act 2016 (the Environment Act) (applies to Wales only). These species and habitats are also known as 'Species and Habitats of Principal Importance for the Conservation of Biodiversity in Wales and England'; and
- Locally important habitats and species which may be identified within Local Biodiversity Action Plans (LBAPs), the Royal Society for the Protection of Birds (RSPB) 'Birds of Conservation Concern' or Red Data books for example.

There is also specific legislation relating to the protection of biodiversity and ecosystem resilience:

- In Wales, Section 6 of the Environment (Wales) Act 2016 requires all public bodies to seek to maintain and enhance biodiversity so far as is consistent with the proper exercise of their functions and in so doing promote the resilience of ecosystems.
- Also relevant is the Wellbeing of Future Generations (Wales) Act 2015, which requires public bodies to embed sustainable development principles, aimed at achieving the seven wellbeing goals, including to maintain and enhance a biodiverse natural environment. Whilst Welsh Water is not considered a public body under the Wellbeing Act, the organisation is aiming to contribute to Wales achieving the wellbeing goals and has embedded wellbeing objectives in its '2050 vision<sup>6</sup>'. To maintain and enhance biodiversity as part of its function will support Welsh Water's contribution to the wellbeing goals, and the company's 2050 vision.

## 2.3 Invasive Non-Native Species

- Invasive Non-Native species (INNS) listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) may also occur within or adjacent to where projects are delivered. It is illegal to plant or otherwise cause to grow in the wild any plant listed in Schedule 9 or to release or allow to escape into the wild any animal which is listed in Schedule 9.
- The Invasive Alien Species (Enforcement and Permitting) Order 2019 (the Invasive Species Order') strengthens the legislation in relation to widely spread species of European Union concern, requiring

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<sup>6</sup> Welsh Water 2050 Vision (March 2018) <https://www.dwrcymru.com/en/Company-Information/Business-Planning/Welsh-Water-2050.aspx>

effective management measures to be put in place to minimise their impacts. It is an offence to import, keep, breed/grow, transport, sell, use, allow to reproduce, or release into the environment the species listed in Schedule 2 of this Order.

## 2.4 National Planning Policy

At a national level, Planning Policy Wales Edition 11<sup>7</sup> Chapter 6 (Distinctiveness and Natural Places) paragraph 6.4 (Biodiversity and Ecological Networks) requires Local Authorities, when formulating development plan strategies, policies and development proposals to consider the need to:

- Support the conservation of biodiversity, in particular the conservation of wildlife and habitats;
- Ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;
- Ensure statutory and non-statutory designated sites are properly protected and managed;
- Safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and
- Secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.

Planning Policy Wales is supplemented by Technical Advice Note (TAN) 5<sup>8</sup> (Nature Conservation and Planning) which provides further advice and detail about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. The TAN brings together advice on sources of legislation relevant to various nature conservation topics which may be encountered by Local Planning Authorities.

## 2.5 Welsh Water Plans and Policies

Welsh Water have translated their legal obligations into several internal policies, strategies and reports including the following.

- Welsh Water 2050 (March 2018) Strategic Response 14: Supporting Ecosystems and Biodiversity which states; *“We will look for ways to help nature, enhance biodiversity and promote ecosystem resilience while we carry out our water and sewerage activities”*;
- Making Time for Nature (2020): Welsh Water’s revised plan for maintaining and enhancing biodiversity under Section 6 of the Environment (Wales) Act 2016; and
- Doing the right thing for nature (December 2019) Welsh Water’s statutory report on the Biodiversity Duty under Section 6 of the Environment (Wales) Act 2016.

Developers must ensure that they comply with the above legislation and policy by fully assessing the potential impacts on protected and priority species and habitats from proposed developments. Where planning permission is required, this assessment must be finalised prior to and included with the submission of the planning application. The Local Planning Authority can then ensure that the necessary protected species and habitats information has been provided to inform an assessment and that proposals are in full accordance with relevant legislation and planning policy.

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<sup>7</sup> Planning Policy Wales Edition 11 (February 2021) Welsh Government

<sup>8</sup> Technical Advice Note 5 Nature Conservation and Planning (September 2009) Welsh Government



### 3. Methodology

#### 3.1 Zone of Influences

The current guidance on ecological assessments<sup>9</sup> recommends that all ecological features that occur within a 'Zone of Influence' (Zol) for a proposed development are investigated.

The Zol includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution, noise or vibration disturbance during construction and/or operation.

The Zol is variable depending on the nature of the construction activities and the ecological receptors affected. For this assessment the following zones have been defined (Table 1).

**Table 1: Zone of Influence for the Assessment**

Zone of Influence for the Assessment	
Ecological Feature	Zone of Influence
Designated Sites	2.0km buffer around site boundary
Internationally Designated Sites for bats	5.0km buffer around the site boundary
Protected species/habitats records from the last 10 years	2.0km buffer around site boundary
Protected species/habitats evidence	30m buffer around the site boundary*

\* Unless otherwise stated below for specific species (i.e. great crested newt where consideration up to 250m would be given in accordance with best practice for temporary works).

The site boundary has been taken as the temporary access track (as shown in red on Figure 1) for the desk study.

#### 3.2 Desk study

A desk study was undertaken in accordance with current guidelines for Preliminary Ecological Appraisal<sup>10</sup> to determine the presence of any designated nature conservation sites and protected or notable species within the Zol of the site boundary.

Biological records were accessed from Aderyn<sup>11</sup> in May 2023. The data provided from this source (provided in full in Appendix A) has been curtailed to the nearest record for each species recorded. Raw data is available on request, in line with record centre terms and conditions.

The desk study involved consulting the following additional sources:

- Multi Agency Geographical Information for the Countryside (MAGIC) website for statutory designated sites<sup>12</sup>
- Natural Resources Wales (NRW) for criteria of designated sites<sup>13</sup>

<sup>9</sup> CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, September 2018. Chartered Institute of Ecology and Environmental Management, Winchester.

<sup>10</sup> CIEEM (2017) Guidelines for Preliminary Ecological Appraisal (2nd edition), December 2017. Chartered Institute of Ecology and Environmental Management, Winchester.

<sup>11</sup> <https://aderyn.lercwales.org.uk/>

<sup>12</sup> <http://www.natureonthemap.naturalengland.org.uk/MagicMap>;

<sup>13</sup> <http://naturalresources.wales>;

- Ancient Woodland Inventory 2011<sup>14</sup>
- The relevant 1:25,000 scale Ordnance Survey (OS) sheet and aerial photography were reviewed to check for waterbodies within 250m of the site boundary as recommended in the Great Crested Newt Conservation Handbook for temporary works<sup>15</sup>.
- Three reports relating to the main WwTW planned expansion:
  - St Nicholas WwTW Preliminary Ecological Appraisal Report<sup>16</sup>
  - St Nicholas Dormouse Survey Report<sup>17</sup>
  - St Nicholas Bat Tree Climbing Survey Memo Report<sup>18</sup>

### 3.3 Field Surveys

A field survey was undertaken on 21 April 2023 by Siân Carr (MCIEEM) and Joseph D'Souza (ACIEEM). The access track along the red line boundary shown on Figure 1 was subject to an ecological walkover to identify the potential ecological constraints including invasive non-native species listed in Schedule 9 of the WCA and to inform scheme design. The survey extended to 30m beyond the site boundary. A detailed hedgerow assessment was not undertaken at this time.

An assessment was also undertaken of the likely presence or absence of protected and notable species within the survey area. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations.

The survey area is shown in Appendix B and includes the footprint of the works, as well as any temporary compounds, storage areas and access to the site.

### 3.4 Bat Inspection Surveys

During the initial field survey, trees within survey area were assessed for their potential to support roosting bats. They were inspected from ground level using binoculars and torch for potential roost features (PRFs) as identified within Collins (ed. 2016)<sup>19</sup>. PRFs may include the following:

- Woodpecker holes;
- Rot holes;
- Hazard beams;
- Other vertical or horizontal cracks;
- Partially detached bark;
- Knot holes;
- Man-made holes;
- Cankers;
- Other hollows or cavities;
- Double leaders;
- Gaps between overlapping stems or branches,
- Partially detached ivy (*Hedera helix*) with stem diameters in excess of 50mm; and / or
- Bat, bird or dormouse boxes.

Any evidence of bats using PRFs was also noted for example;

- Bat droppings in, around or below the feature;
- Odour emanating from a feature;
- Audible squeaking at dusk or in warm weather; and / or
- Staining below the feature.

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<sup>14</sup> <https://ati.woodlandtrust.org.uk/>

<sup>15</sup> Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001). Great Crested Newt Conservation Handbook, Froglife, Halesworth.

<sup>16</sup> Arcadis (2022) St Nicholas Wastewater Treatment Works Ecological Constraints Memo (Doc Ref B10180-0AG964-ZZ-ZZ-RP-NA-ED0052)

<sup>17</sup> Arcadis (2023) St Nicholas Dormouse Survey Report

<sup>18</sup> Arcadis (2023) St Nicholas Bat Tree Climbing Memo Report

<sup>19</sup> Collins, J. (Ed.) (2016) Bat Surveys for Professional Ecologists – Good Practice Guidelines (3<sup>rd</sup> edition). Bat Conservation Trust

### 3.5 Badger Survey

During the field survey, evidence of the use of the site by badger (*Meles meles*) was undertaken. This included a search for setts, latrines, snuffle holes, mammal paths and hairs along hedgerows within the survey area.

### 3.6 Limitations

Biological records obtained from third parties and presented in the desk study do not represent a full and complete species list for the area as they are mostly provided by individuals on an ad hoc basis.

Details of some non-statutory sites were not available at the time of the survey, however there were no non-statutory sites located within the survey area and due to the scale and temporary nature of the works no impacts are anticipated on sites distant from the proposed development.

Ecological surveys are limited by factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour. With a single survey visit it is possible that certain species may have been overlooked or under-recorded during the assessment as optimal survey periods vary from species to species. The survey does however provide a “snapshot” of the ecological interest present during the survey and is considered sufficient to identify constraints and recommendations for further survey.

## 4. Results

### 4.1 Desk Study

#### 4.1.1 Statutory Designated Sites

The desk study returned no statutory designated sites within 2km of the site. There are also no Special Areas of Conservation (SACs) designated for bats within 5km of the site.

#### 4.1.2 Non-statutory Designated Sites

The desk study identified 34 Sites of Importance for Nature Conservation (SINCs) within 2km of the site. Details of the five nearest sites are provided in Table 2 below with the remainder in Appendix C.

**Table 2: Non-Statutory Designated Sites within 500m**

Non-Statutory Designated Sites			
Name	Status	Details	Distance and Direction
Land along River Waycock	SINC	Details not available at the time of reporting	121m south
Coed Y Cwm	SINC	Semi-natural broadleaved woodland, noted as having potential for bat roosts and dormouse.	134m north-west
Coed Sion Hywel	SINC	A large woodland, in part native deciduous woodland with good structure and diversity, in part a mixed plantation woodland (with larch very common), in part a beech plantation.	185m south
Brook Wood	SINC	An irregular shaped woodland with a northerly aspect. A stream (fenced against adjacent fields) forms the northern boundary.	354m south-west
Land at Winchpit	SINC	Woodlands (broadleaved) occupying a steep narrow north-west facing slope. Woodland appears semi-natural and old-established.	473m north-east

There are 50 areas of ancient woodland (comprising ancient semi-natural woodland and restored ancient woodland) within 2km of the site. The nearest ancient semi-natural woodland is approximately 200m south of the site. The nearest restored ancient woodland site borders the southern boundary of the site associated with Tinkinswood burial chamber as shown on Figure 1.

There are five NRW Priority Areas of Woodland (PAWs) within 2km of the proposed development. The closest PAW is approximately 400m south-west of the site.

#### 4.1.3 Waterbodies

No ponds were found on the OS maps within 250m of the site.

Watercourses identified on OS maps include the River Waycock approximately 120m south of the site. Tributaries of the River Waycock located adjacent to the western boundary of the existing WwTW and a field drain 50m south of the eastern end of the access track which leads into a highways ditch alongside Dyffryn Lane.

#### 4.1.4 Protected and Notable Species

##### Protected Flora

A total of 53 records were returned for Bluebell (*Hyacinthoides non-scripta*) listed on Schedule 8 of the WCA, with the closest record being 373m from the proposed development.

### Protected Mammals

A total of 74 records of bat were recorded within 2km of the site. Species included brown long-eared bat (*Plecotus auritus*), noctule bat (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), whiskered bat (*Myotis mystacinus*) and serotine bat (*Eptesicus serotinus*). *Myotis* and *Pipistrellus* bats of unconfirmed species were also recorded. The closest records were for common pipistrelle, *Myotis* and noctule bats within 1km of the site, but none on site. The closest roost recorded was for an unknown bat species located 1009m from the site.

Surveys of the WwTW site identified a Common pipistrelle roost in a building within the WwTW but no tree roosts.

A total of eleven records were returned for badger. The closest record was 1170m south of the site.

Five records were returned for otter (*Lutra lutra*), with the closest record being 1392m south-east of the site.

### Other Mammals

A total of six other mammal species were recorded within 2km of the site: hedgehog (*Erinaceus europaeus*), hare (*Lepus europaeus*), harvest mouse (*Micromys minutus*), stoat (*Mustela erminea*), weasel (*Mustela nivalis*) and polecat (*Mustela putorius*). The closest record of these species was hare recorded 487m from the site.

### Birds

A total of 76 species of birds were recorded within 2km of the site. Species recorded included the following WCA Schedule 1 species: fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*), kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), black redstart (*Phoenicurus ochruros*), hobby (*Falco subbuteo*), brambling (*Fringilla montifringilla*), crossbill (*Loxia curvirostra*), goshawk (*Accipiter gentilis*), barn owl (*Tyto alba*) and red kite (*Milvus milvus*). The closest record of Schedule 1 species was for red kite and redwing 487m from the site.

A total of 28 bird species listed on Section 7 of the Environment (Wales) Act 2016 were recorded. The closest species recorded include the Eurasian skylark (*Alauda arvensis*), linnet (*Linaria cannabina*) and dunnock (*Prunella modularis*) located 487m from the site.

### Reptiles and Amphibians

Two species of reptile and six species of amphibian were recorded within 2km of the site. The closest reptile record was for grass snake (*Natrix helvetica*) located 1009m from the site. The closest amphibian record was for palmate newt (*Lissotriton helveticus*) 731m from the site, and the closest great crested newt (*Triturus cristatus*) record is 995m from the site.

### Invertebrates

A total of 29 invertebrate species were recorded within 2km of the site. One butterfly species was recorded that is listed under Section 7 of the Environment (Wales) Act 2016, the dingy skipper (*Erynnis tages*) located 700m from the site. A total of 11 moths listed under Section 7 of the Environment (Wales) Act 2016 were recorded, the closest record was for dark-barred twin-spot carpet (*Xanthorhoe ferrugata*) 554m from the site.

### Fish

No fish species were recorded within 2km of the site.

### Bryophytes, Lichens and Fungi.

One species of lichen was recorded within 2km of the site that is listed under Section 7 of the Environment (Wales) Act 2016, namely *Punctelia jeckeri*.

### Invasive Non-native Species

No invasive non-native plant species were recorded within 2km of the site.

## 4.2 Field Surveys

### 4.2.1 Habitats

The habitats recorded within the survey area are described below, with accompanying photographs. The Phase 1 Habitat plan is shown on Drawing B10181-0AG964-ZZ-ZZ-PL-NB-DI0233 with target notes detailed in Appendix D.

#### Broad-leaved woodland (restored ancient woodland)

A corner of Tinkinswood was within the survey area but the access track will not pass through it. This is an area of restored semi-natural ancient woodland. Tree species noted included Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Pedunculate Oak (*Quercus robur*), Hazel *Corylus avellana*), Holly (*Ilex aquifolium*), Beech (*Fagus sylvatica*), Ash (*Fraxinus excelsior*) and Elder (*Sambucus nigra*). The structure was varied with woodland flora including Herb-Robert (*Geranium robertianum*), Dog's Mercury (*Mercurialis perennis*), Wood avens (*Geum urbanum*), Bluebell (*Hyacinthoides non-scripta*), Hart's-tongue (*Asplenium scolopendrium*), Common Nettle (*Urtica dioica*), Creeping Buttercup (*Ranunculus repens*) and Soft-brome (*Bromus hordeaceus*) noted. Bramble (*Rubus fruticosus* agg.), Willowherb species (*Epilobium* sp) and Ivy (*Hedera helix*) were also identified.

#### Semi-improved grassland

A small area of species rich semi-improved grassland was within the eastern part of the survey area but the access track will not pass through it. Brome species (*Bromus* sp), Smooth Meadow-grass (*Poa pratensis*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Yorkshire-fog (*Holcus lanatus*), Perennial Rye grass (*Lolium perenne*), and Quaking-grass (*Briza media*) were identified along with Cleavers, Hogweed (*Herculeum sphondylium*), Willowherb sp., Common nettle, Creeping Buttercup, Creeping Thistle (*Cirsium averse*), Silverweed (*Potentilla anserina*), Ribwort Plantain (*Plantago lanceolata*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Germander Speedwell (*Veronica chamaedrys*), Common Mouse-ear (*Cerastium fontanum*), Yellow Vetchling (*Lathyrus aphaca*) and Tufted Vetch (*Vicia cracca*).



Photograph 1: Semi-improved grassland

#### Improved Grassland

The survey area included four fields of improved grassland (Photograph 2). The fields were grazed by sheep at the time of the survey. Species identified included Perennial Rye grass, Annual Meadow-grass (*Poa annua*) White Clover (*Trifolium repens*), Ribwort Plantain, Creeping Buttercup, Creeping Thistle, Yarrow (*Archillea millefolium*), Common Mouse-ear and Eyebright (*Euphrasia* agg.). The fields supported occasional dense patches of Common Nettle, in particular the most western field and associated with a rabbit (*Oryctolagus cuniculus*) warren (TN1) at the eastern end of the survey area and another associated with a rocky outcrop (TN6) near the centre of the survey area.



The most eastern field adjacent to Dyffryn Lane had a longer sward and additional species were noted around the field margins including: Brome sp., Sweet Vernal-grass, Daisy (*Bellis perennis*), Greater Plantain (*Plantago major*), Cut-leaved Crane's-bill (*Geranium dissectum*), Tufted Vetch and Lesser Celandine (*Ficaria verna*).






Photograph 2 – Improved grassland

### Hedgerow

The survey area contained eight hedgerows, the access track is proposed to go through gateways in three of these. All hedgerows had been recently flailed except H5 and H8 and were approximately 1.5-1.75m tall; further details are provided in Table 3. The hedgerows were part of a wider network of connected hedgerows and woodland blocks. This network was set in a landscape of grazed pastures.




**Table 3: Hedgerow Descriptions and Photographs**

Hedgerow Reference Number	Description	Photograph
1	<p>Slight hedge bank to field to west.</p> <p>Fenced both sides with 3m gateway at access point of proposed access track and a pedestrian gate.</p> <p>Species noted included Hazel, Elder, Holly, Hawthorn and Willow (<i>Salix</i> sp.) with some Bramble and a varied ground flora including Lords-and-Ladies (<i>Arum maculatum</i>), Lesser Celandine (<i>Ficaria verna</i>), Cow Parsley (<i>Anthriscus sylvestris</i>), Common Nettle, Primrose (<i>Primula vulgaris</i>), Hogweed, Common polypody (<i>Polypogon vulgare</i>), Dog's Mercury, Hart's-tongue and Dock (<i>Rumex</i> sp.).</p>	

Hedgerow Reference Number	Description	Photograph
2	<p>Slight embankment to field to north, associated with fence in places.</p> <p>Species noted included Hazel, Hawthorn and Blackthorn with Common Nettle, Dog's mercury, Cleavers (<i>Galium aparine</i>), Hogweed, Lords-and-Ladies and Ground-ivy (<i>Glechoma hederacea</i>).</p>	
3 and 4	<p>Defunct hedgerows and associated with fence line. H4 was associated with an embankment.</p> <p>NB H3 is outside the survey area but was noted in association with an alternative route earlier in the design.</p> <p>Species noted included Elder, Hawthorn, Hazel, Bramble, Ivy, Common Nettle, Cleavers and Ground-ivy</p>	
5	<p>Unmanaged dense hedgerow.</p> <p>Dominated by conifers and Willow with a single Scots Pine (<i>Pinus sylvestris</i>).</p> <p>Cow Parsley, Bramble, Ivy and Common Nettle were also noted.</p>	



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Hedgerow Reference Number	Description	Photograph
6	<p>A fragment of defunct hedgerow approx. 15m long.</p> <p>Elder; Hawthorn, Blackthorn and a single Ivy clad Hawthorn tree were noted with ground flora contiguous with the adjacent grassland.</p>	
7	<p>A 2m wide hedgerow associated with fence and wet area (TN7).</p> <p>Proposed access track will pass through a 3m wide gateway.</p> <p>Species noted included Elder, Hawthorn, Hazel, Bramble scrub and Dog Rose (<i>Rosa canina</i>) with Ivy, Common Nettle, Cleavers and Ground-ivy.</p>	
8	<p>1-1.5m high intact, hedgerow associated with embankment and fencing.</p> <p>Species present included Blackthorn, Ash, Field Maple (<i>Acer campestre</i>), Holly and Bramble.</p> <p>Also present were five trees (TN9) previously assessed for their roosting potential<sup>20</sup></p>	

<sup>20</sup> Arcadis (2023) St Nicholas – Bat Tree Climbing Memo Report

### Scattered Scrub

A small amount of scrub (Bramble dominant) was located in the most eastern field, to the north of the access track associated with Willow and tall ruderal species including the dead stems from last year's growth of Willowherb and Umbellifer species.

### Scattered Broadleaved Trees

Occasional broadleaved trees were located predominately along field boundaries and hedgerows (TN1, 3, 4, 5 and 9). Tree species recorded included Pedunculate Oak (*Quercus robur*), Hawthorn and Sycamore. Photographs of some of these trees are provided in Appendix D.

### Running Water

A field drain in hedgerow H7 (TN 7) approximately 10m south of the proposed access track created a flush which flowed into a ditch (Photograph 2) dominated by Dropwort (*Oenanthe* sp) outside of the survey area;. This ditch connected to the River Waycock to the south of the site.



Photograph 3 – Ditch alongside hedgerow H7

### Hardstanding

Hardstanding was located on Dyffryn Lane. There was also an area of disturbed ground containing construction materials on the route of the proposed access track (TN2) and two rocky outcrops (TN6 and TN8).

### Fencing and Gates

Wooden, wire and stock-proof fencing were identified at various locations across the survey area with gateways along the route of the proposed access track (Photograph 5).





Photograph 4: Example of fencing and gateway viewed across site (this photograph is H7).

#### 4.2.2 Protected and Notable Species

The following species were recorded during the field survey. Where habitats were present indicating the potential to support a specific species these have also been noted.

##### Birds

Scattered trees and hedgerows within the survey boundary were assessed as having potential to support nesting birds. Long-tailed tit (*Aegithalos caudatus*), goldcrest (*Regulus regulus*), song thrush (*Turdus philomelos*), blue tit (*Cyanistes caeruleus*), robin (*Erithacus rubecula*), wood pigeon (*Columba palumbus*), chiffchaff (*Phylloscopus collybita*), chaffinch (*Fringella coelebs*) and wren (*Troglodytes troglodytes*) were all heard calling during the field survey and a swallow (*Hirundo rustica*) was observed flying over the survey area.

The survey area did not contain suitable nesting sites for the Schedule 1 species recorded by the desk study or was outside the known geographic area that supports those species when breeding. The habitats within the survey area were suitable to support breeding populations of some of the Section 7 species recorded during the desk study, namely linnet and dunnoek. Given the presence of grazing animals it is less likely that the fields support nesting skylark.

##### Bats

Trees within the survey area have the potential to support roosting bats. Trees (TN1, 3, 4 & 9), woodland, grazed pastures and hedgerows have the potential to support foraging and commuting bats. The habitat within the survey area has moderate suitability to support foraging and commuting bats as it is connected to the wider landscape via hedgerows and lines of trees.

Surveys at the WwTW have recorded common pipistrelle, soprano pipistrelle and noctule bats (report in preparation).

Trees (TN3, 4, 5) within the survey area were identified as to be of an age or structure suitable for supporting PRFs for bats (e.g. woodpecker holes, tear outs, split limbs) and/or suitable features were noted during the survey. Photographs can be found in Appendix D. The works are not in close proximity to these trees and no impacts have been identified.

Five trees within H8 (TN9) were assessed for their bat roosting potential during 2022/2023<sup>21</sup>. The access track will pass through hedgerow H8 in a gateway in close proximity to the most southerly of these trees which had a number of PRFs but no roost has been identified (report in preparation).

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<sup>21</sup> Arcadis (2023) St Nicholas – Bat Tree Climbing Memo Report

### Hazel Dormouse

The desk study did not return any records of Hazel dormouse (*Muscardinus avellanarius*) within 2km of the site, but dormice are known to be present in the vicinity of the site and across the Vale of Glamorgan from previous Arcadis project experience. The nearest SINC (see Table 3) has also been noted for its potential to support Hazel dormouse. Hedgerows within the survey boundary have the potential to support dormouse, however, surveys (July - November 2022 and April-June 2023) around the main WwTW site have not found evidence of dormouse<sup>22</sup>.

### Badger

No evidence of badger activity was observed during the field survey and the only evidence recorded to date in relation to the WwTW extension has been a single badger crossing Brook Lane (Arcadis observations to date). A number of mammal tracks were observed in Tinkinswood but could not be attributed directly to badger. It would seem unlikely that a large active main sett is present in the immediate locality given the lack of field signs, but it remains possible that a sett may be present in the woodland immediately adjacent to Duffryn Lane (40m from the proposed access track).

### Other Mammals

The habitats within the survey area were not suitable for water vole (*Arvicola amphibius*) and they are unlikely to be present within the River Waycock 120m south of the site, as the tree lined corridor and fast flowing nature of this watercourse makes it unsuitable for this species.

No evidence of otter activity was observed during the survey. The habitats within the survey area were not suitable for this species, but they are likely to be present within the River Waycock 120m south of the proposed development.

A large rabbit warren was observed close to the eastern end of the site (TN 1). No impacts on rabbit are anticipated.

### Reptiles and Amphibians

The field margins and rocky outcrop (TN6 and 8) within the survey area have the potential to support foraging and hibernating reptiles and dispersing amphibians during their terrestrial phase. There were no suitable waterbodies within the Zone of Influence to support breeding amphibians.

### Fish

Fish are likely to be present within the River Waycock 120m south of the site, but there were no waterbodies within the survey area suitable to support fish species.

### Invertebrates

Mature, scattered trees, hedgerows and grasslands within the survey area provide habitat for a range of common terrestrial invertebrates. Suitable habitat within the grazed fields is limited due to the tightly grazed sward. Invertebrates are not considered to be a constraint.

### Invasive Non-native Species

No invasive non-native species were identified during the survey. Invasive non-native species are considered to be absent from the site.

## 5. Discussion and Analysis of Results

The interpretation of the desk study and field survey results are discussed under the appropriate headings below. The value/importance of an ecological feature has been assigned using Ecological Impact Assessment<sup>23</sup> guidelines.

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<sup>22</sup> Arcadis (2022) St Nicholas Dormouse Survey Report

<sup>23</sup> CIEEM (September 2019) Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal, Marine. Chartered Institute of Ecology and Environmental Management, Winchester. [ECIA-Guidelines-Sept-2019.pdf \(cieem.net\)](https://www.cieem.net/Ecological-Impact-Assessment-Guidelines-September-2019.pdf)



## 5.1 Designated sites

The desk study returned no statutory designated sites within 2km of the site. There are also no SACs designated for bats within 5km of the site. Therefore, no statutory designated sites will be affected by the proposals.

There were no non-statutory designated sites within or immediately adjacent to the survey area, the closest non-statutory site is Coed Y Cwm SINC which is located 134m north-west of the proposed development and is considered to be of County value. The proposed works are localised, small scale, and short duration and it is considered that the SINC will not be directly or indirectly affected by the proposals.

Land along the River Waycock SINC is located 121m south of the proposed development and is considered to be of County value. There is a field drain within the proposed development that currently discharges into the river via a ditch immediately adjacent to the SINC. There are no works required to the field drain but there is potential, in the absence of mitigation for pollution incident to impact the watercourse and therefore SINC due to the proximity for the lush to the access track.

An area of replanted ancient woodland (Tinkinswood) is within the 30m survey area and is considered to be of County value. Regular construction traffic movements within the root protection zone of these trees may lead to compaction of soil around the tree roots and an increase in air pollution from traffic exhausts leading to a decline in the trees.

## 5.2 Habitats

The following habitats are considered to be of intrinsic value and may also be priority habitats such that they would form constraint to proposals: broad-leaved woodland (see ancient woodland above), scattered trees and hedgerows. All the other habitats on site are common and widespread in a local context and are not considered to be a constraint to the proposed works, or the works are of a small scale and a short duration such that no impacts are anticipated.

Hedgerow habitats within the survey area are priority habitats under Section 7 of the Environment (Wales) Act 2016, and are considered to be of at least local value. Hedgerow H1 supported more than 5 woody species and had four associated features and may meet the criteria to be considered an Important hedgerow under the landscape and ecology criteria (but a detailed hedgerow assessment under the Hedgerow Regulations 1997 was not undertaken) and is considered to be of County value.

No hedgerow loss/removal is proposed. If works are identified at a later date and take place under permitted development rights an Important hedgerow removal notice would be required. Where hedgerow removal is unavoidable consideration would need to be given to the translocation of hedgerows to ensure no loss to biodiversity and/or replacement planting.

Regular construction traffic movements within the root protection zone of scattered trees may lead to compaction of soil around the tree roots and a decline in tree health, of particular note to the most southerly tree in Hedgerow H8) as it is within close proximity to the access track.

## 5.3 Protected or Notable Species

The results of the desk study and field survey determined that the species detailed in Table 4 are present or that there is potential for them to be impacted by the proposals.

**Table 4: Potential for protected and priority species and anticipated impact from the proposals.**

Species	Potential Habitat	Potential Effect from proposed temporary access track
Birds	The scattered trees, and hedgerows within the survey area have the potential to support breeding and foraging birds.	The removal of a section of hedgerow has the potential to affect nesting birds during the breeding bird season.
Bats	Some of the trees within the survey boundary have the potential to support roosting bats. Trees (TN9) within H8 do not support roosting bats, and no impacts to the remaining trees with bat roost potential (TN3, 4 and 5) have been identified.	Disturbing works to foraging and commuting bats include construction noise and artificial lighting.

Species	Potential Habitat	Potential Effect from proposed temporary access track
	The trees, hedgerows and grasslands provide suitable foraging and/or commuting habitat for bats.	
Hazel dormouse	The hedgerows and trees within the site were suitable to support nesting, foraging and dispersing dormouse. The hedgerows offered a range of suitable food sources and were part of a wider network of suitable habitat south and west of the survey area.	No impacts have been identified as surveys of the WwTW conclude likely absence in this area and no habitat removal is required.
Badger	The grassland and hedgerows within the survey area were suitable to support foraging and dispersing badger but no evidence of badger or badger setts were found.	Artificial lighting may disturb badgers and construction traffic and open excavations may cause harm/death of individuals.
Water vole and otter	There are no suitable habitats within survey area to support these species. Water vole are unlikely to be present in habitats close to the site, but otters may use the River Waycock 120m south of the site.	No impacts anticipated.
Other mammals - Hedgehog	The grassland and hedgerows within the survey area were suitable to support foraging and resting hedgehogs	Artificial lighting may disturb hedgehogs and construction traffic and open excavations may cause harm/death of individuals.
Reptiles and amphibians	The waterbody (flush and ditch) within the survey area were not suitable to support breeding amphibians. Great crested newt are considered to be absent given the lack of suitable waterbodies within 250m of the site. The field boundaries and hedgerow banks were suitable to support reptiles and amphibians. and it is possible that common species of amphibian could be present in very small numbers.	Removal of a section of hedgerow H8 and associated bank has the potential to harm/cause death of reptiles and common amphibians during their terrestrial phase.
Fish	Fish are likely to be present within the River Waycock south of the site, but there were no waterbodies suitable to support fish within the survey area.	There are no works required to the field drain but there is potential, in the absence of mitigation for a pollution incident to impact the watercourse and therefore fish due to the proximity to the flush to the access track.
Invertebrates	Due to regular grazing in the pasture fields the swards were short and so not suitable to support a diverse range of invertebrate species. The hedgerows and trees within the survey area may support common invertebrate species.	No impacts anticipated.
Flora and lichens	Priority and protected species are unlikely to be present.	No impacts anticipated.

## 6. Discussion, Assessments and Recommendations

An assessment of whether the proposals could impact on the ecological features discussed above is set out within Table 5 below, along with recommendations for further survey or mitigation as relevant. Where protected species or habitats are considered of negligible value or unlikely to be present, these have been scoped out of assessment. In addition, where habitats are only considered a constraint for the protected species they could support, this is set out in the relevant species sections only.

These recommendations refer only to the proposed access track and additional recommendations have been made in relation to the main WwTW extension in the associated PEA<sup>24</sup>.

<sup>24</sup> Arcadis (2022) St Nicholas Wastewater Treatment Works Ecological Constraints Memo (Doc Ref B10180-0AG964-ZZ-ZZ-RP-NA-ED0052)

**Table 5: Recommendations**

Recommendations			
Ecological Feature	Description and Protection	Initial Assessment, Constraint and Risk	Recommended Action
River Waycock SINC (includes fish and otters)		County Value High risk – potential for pollution event to effect water quality	Appropriate pollution prevention control measures
Ancient Woodland	Tinkinswood	National Value High risk – potential for compaction of soil within root protection zone and pollution impacts from construction traffic exhausts.	A tree survey has been commissioned to inform root protection measures and the report will include appropriate measures to protect this area.
Scattered Trees /hedgerows	Hedgerows are considered a Priority habitat protected under Section 7 of the Environment (Wales) Act 2016.	Local value High risk.  There is an impact if works require the removal of trees/hedgerows or if root protection areas are impacted.	Trees/hedgerows should be retained and protected where possible including their rooting areas. A tree survey has been commissioned to inform the root protection areas. Where habitat losses are required, these should be minimised and should not affect the integrity of the feature.  Compensation would likely be required (i.e. replacement planting and/or management of retained trees/hedgerows). Losses or damage and appropriate management should be agreed with an ecologist.  A hedgerow removal notice may be required for H1 should any clearance be identified. Translocation/replacement planting may be required to ensure no loss to biodiversity.
Bats	Potential foraging and commuting opportunities across the survey area. Bat species and their roosts are fully protected under the Conservation of Habitats and Species Regulations 2017, as amended <sup>12</sup> and the WCA <sup>10</sup> .	If roost is present, high constraint, risk of loss of roosting habitat.  Disturbing works include construction noise and artificial lighting.	Complete ongoing emergence surveys of trees within Hedgerow H8.  If the presence of a roost is confirmed in the tree adjacent to the access gate through H8 review the access point. If the access point cannot be changed and works are anticipated to impact this tree and/or limbs of the tree need to be removed to enable access through this gate then a mitigation licence may be required. Seasonal constraints to works may apply.  Avoid night-time working and temporary lighting of the access track.
Birds/reptiles/amphibians	Hedgerows were considered to have potential to support breeding birds, reptiles and amphibians (terrestrial phase).  Breeding birds are protected under the WCA.	Minor constraint – risk of disturbing breeding birds and injuring reptiles/amphibians.	Sensitive timing of hedgerow removal and ECoW supervision
Badger and hedgehog	Hedgerows were considered to have potential to support a badger sett but no evidence was found. Badgers may use grassland for foraging.  Badgers are protected	Minor constraint – risk of injury from collision with construction traffic/open excavations and disturbance through the use of artificial lighting.	Avoid night time working.  Ensure open excavations are covered at night.

Recommendations			
Ecological Feature	Description and Protection	Initial Assessment, Constraint and Risk	Recommended Action
	<p>under The Protection of Badger Act 1992.</p> <p>Hedgehogs may forage and hibernate in the hedgerows. Hedgehogs are a Section 7 EWA species.</p>		
Site Wide	N/A	N/A	<p>Construction Environment Management Plan to be prepared to include for bog mats to be deployed in wet areas (i.e. crossing point within Hedgerow H7) and avoidance of areas of semi-improved grassland.</p> <p>Grassland habitats should be reinstated or made good once the proposed access track is no longer required with species rich seed mixes where appropriate.</p>

## 7. Conclusion

Habitats recorded within the survey boundary included priority habitats woodland (described as ancient woodland in the desk study) and hedgerow. The habitats identified have the potential to support nesting birds, roosting, foraging and commuting bats, Hazel dormouse, badger, reptiles, amphibians (during their terrestrial phase) and hedgehogs, with similar risks, constraints and mitigation required as those described for the main WwTW. In addition, this report has identified that the River Waycock and the Land adjacent to the River Waycock which is a SINC and an area of restored ancient woodland are additional constraints to the temporary access track.

Subsequent surveys have confirmed likely absence of Hazel dormouse and no bat roost in trees likely to be impacted by the proposals.

A Construction Environment Management Plan should be prepared to also ensure that the River Waycock and SINC, area of restored ancient woodland (Tinkinswood), mature trees and hedgerows outside the works boundary are not impacted by the works to include practical pollution prevention control measures, root protection zones and sensitive site clearance.

Good construction practices should be implemented as follows:

- Ancient woodland, trees and hedgerows are to be retained and protected including their rooting zones with the proposed access track passing through existing gateways where possible;
- If works are undertaken over winter, the use of bog mats or similar should be considered especially in the wetter areas (e.g. the grassland around Hedgerow H7);
- A sensitive methodology/programme of works should be adopted in relation to breeding birds, reptiles and amphibians if vegetation removal is identified at a later date;
- No night-time working to prevent harm to badgers and hedgehogs and disturbance of foraging/commuting bats;
- Pollution prevention measures to be in place with no refuelling undertaken along the access track and spill kits to be available at the main site compound; and
- Any damaged grassland to be re-seeded/re-instated once works are completed with species rich seed mixes where appropriate to ensure net benefit to biodiversity.

In line with guidance on the lifespan of surveys and reports, this report is valid for two years (i.e. until May 2025).



## 8. Appendices

Appendix A	Local Record Centre Data Search Results
Appendix B	Phase 1 Habitat Plan
Appendix C	SINC's distant (<500m) from the proposed development
Appendix D	Target Note descriptions and photographs



# Appendix A

## Local Record Centre Data Search Results

Distance from proposed development (m)	Common Name	Scientific Name	Conservation status
<b>Birds</b>			
350	Eurasian Skylark	<i>Alauda arvensis</i>	S7, LBAP (VOG), WBAm(RSPB), UKBR(RSPB)
350	Yellowhammer	<i>Emberiza citrinella</i>	S7, Bern, WBR(RSPB), LBAP (VOG), UKBR(RSPB)
350	European Herring Gull	<i>Larus argentatus</i>	S7, WBR(RSPB), LBAP (VOG), UKBR(RSPB)
350	Linnet	<i>Linaria cannabina</i>	S7, Bern, WBR(RSPB), LBAP (VOG), UKBR(RSPB)
350	Red Kite	<i>Milvus milvus</i>	BDir1, WCA1.1, WBAm(RSPB)
350	House Sparrow	<i>Passer domesticus</i>	S7, LBAP (VOG), WBAm(RSPB), UKBR(RSPB)
350	Dunnock	<i>Prunella modularis</i>	S7, Bern, LBAP (CON, POW, VOG), UKBAm(RSPB)
350	Eurasian Bullfinch	<i>Pyrrhula pyrrhula</i>	S7, WBR(RSPB), LBAP (VOG), UKBAm(RSPB)
350	Starling	<i>Sturnus vulgaris</i>	S7, Bern, WBR(RSPB), LBAP (VOG), UKBR(RSPB)
350	Redwing	<i>Turdus iliacus</i>	WCA1.1, LBAP (CON, POW), WBAm(RSPB), UKBR(RSPB)
350	Song Thrush	<i>Turdus philomelos</i>	S7, Bern, LBAP (VOG), WBAm(RSPB), UKBR(RSPB)
350	Long-tailed Tit	<i>Aegithalos caudatus</i>	WBAm(RSPB)
350	Grey Heron	<i>Ardea cinerea</i>	WBAm(RSPB)
350	Greenfinch	<i>Chloris chloris</i>	Bern, WBAm(RSPB)
350	Whitethroat	<i>Curruca communis</i>	WBR(RSPB),
350	Swallow	<i>Hirundo rustica</i>	Bern, LBAP (VOG), WBAm(RSPB)
350	Lesser Black-backed Gull	<i>Larus fuscus</i>	WBAm(RSPB), UKBAm(RSPB)
350	Willow Warbler	<i>Phylloscopus trochilus</i>	WBR(RSPB), UKBAm(RSPB)
350	European Green Woodpecker	<i>Picus viridis</i>	Bern, WBAm(RSPB)
350	Goldcrest	<i>Regulus regulus</i>	Bern, WBAm(RSPB)
350	Mistle Thrush	<i>Turdus viscivorus</i>	Bern, WBAm(RSPB), UKBR(RSPB)

Distance from proposed development (m)	Common Name	Scientific Name	Conservation status
350 <i>Bryophytes</i>	Common House Martin	<i>Delichon urbicum</i>	Bern, LBAP (VOG), UKBAm(RSPB)
	Common Feather-moss	<i>Kindbergia praelonga</i>	RDB1 (Wales) - LC
	Nicholson's Beard-moss	<i>Didymodon nicholsonii</i>	RDB1 (Wales) - LC, LI(BIS)
	Twist-tip Feather-moss	<i>Oxyrrhynchium schleicheri</i>	RDB1 (Wales) - LC
<i>Invertebrates</i>			
742	Dark-barred Twin-spot Carpet	<i>Xanthorhoe ferrugata</i>	S7, LBAP (VOG)
801	Dingy Skipper	<i>Erynnis tages</i>	S7, RDB1 (UK) - VU, LBAP (VOG), LI(SEWBrEC)
1071	Blood-vein	<i>Timandra comae</i>	S7, LBAP (VOG)
1071	Banded General	<i>Stratiomys potamida</i>	RDB2 (UK) - N
1071	Beautiful Agrion	<i>Calopteryx virgo</i>	LI(SEWBrEC)
1071	Golden-ringed Dragonfly	<i>Cordulegaster boltonii</i>	LI(SEWBrEC)
1071	Speckled Bush-cricket	<i>Leptophyes punctatissima</i>	LI(SEWBrEC)
1071	Black-tailed Skimmer	<i>Orthetrum cancellatum</i>	LI(SEWBrEC)
1141	White Ermine	<i>Spilosoma lubricipeda</i>	S7, LBAP (VOG)
1148	Cinnabar	<i>Tyria jacobaeae</i>	S7, LBAP (VOG)
1211	Brindled Beauty	<i>Lycia hirtaria</i>	S7, LBAP (VOG)
1283	Knot Grass	<i>Acronicta rumicis</i>	S7, LBAP (VOG)
1283	Green-brindled Crescent	<i>Allophyes oxyacanthae</i>	S7, LBAP (VOG)
1283	Small Phoenix	<i>Ecliptopera silaceata</i>	S7, LBAP (VOG)
1283	Shaded Broad-bar	<i>Scotopteryx chenopodiata</i>	S7, LBAP (VOG)
1639	Short-winged Cone-head	<i>Conocephalus dorsalis</i>	LI(SEWBrEC)
1760	Hairy Dragonfly	<i>Brachytron pratense</i>	LI(SEWBrEC)
1760	Red-eyed Damselfly	<i>Erythromma najas</i>	LBAP (VOG), LI(SEWBrEC)
1801	Median wasp	<i>Dolichovespula media</i>	RDB2 (UK) - NA
1807	Black-headed Cardinal Beetle	<i>Pyrochroa coccinea</i>	RDB2 (UK) - NB
<i>Lichens</i>			

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Distance from proposed development (m)	Common Name	Scientific Name	Conservation status
839	A lichen	<i>Dactylospora parasitica</i>	RDB2 (UK) - S
839	A lichen	<i>Sphinctrina turbinata</i>	RDB2 (UK) - S
839	A lichen	<i>Melanohalea exasperatula</i>	RDB1 (Wales) - LC
839	A lichen	<i>Myriolecis persimilis</i>	RDB1 (Wales) - DD
1071	A lichen	<i>Caloplaca aurantia</i>	RDB1 (Wales) - LC
1084	A lichen	<i>Caloplaca flavocitrina</i>	RDB1 (Wales) - LC
1084	A lichen	<i>Myriolecis crenulata</i>	RDB1 (Wales) - LC
1211	A lichen	<i>Opegrapha vermicellifera</i>	RDB1 (Wales) - LC
<b>Mammals</b>			
350	Brown Hare	<i>Lepus europaeus</i>	S7, LBAP (VOG)
696	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
763	Noctule Bat	<i>Nyctalus noctula</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
848	Unidentified <i>Myotis</i> Bat	<i>Myotis</i> sp.	EPS, HDir, WCA5, Bern
896	Unidentified Pipistrelle bat	<i>Pipistrellus</i> sp.	EPS, WCA5,
1089	Serotine Brown Long-eared Bat	<i>Eptesicus serotinus</i>	EPS, HDir, WCA5, Bern, RDB2 (UK),
1143		<i>Plecotus auritus</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
1143	Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
1190	Eurasian Badger	<i>Meles meles</i>	BA, Bern,
1200	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
1235	West European Hedgehog	<i>Erinaceus europaeus</i>	S7, Bern, LBAP (VOG)
1760	Weasel	<i>Mustela nivalis</i>	NRW, Bern
1818	Stoat	<i>Mustela erminea</i>	NRW, Bern,
1821	Harvest Mouse	<i>Micromys minutus</i>	S7, LBAP (VOG)
<b>Reptiles and amphibians</b>			
949	Slow worm	<i>Anguis fragilis</i>	WCA5, S7, Bern, LBAP (VOG)
1071	Grass Snake	<i>Natrix helvetica</i>	WCA5, S7, Bern, LBAP (VOG), LBAP (VOG)

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Distance from proposed development (m)	Common Name	Scientific Name	Conservation status
751	Common Frog	<i>Rana temporaria</i>	HDir, WCA5, Bern
1069	Great Crested Newt	<i>Triturus cristatus</i>	EPS, HDir, WCA5, S7, Bern, RDB2 (UK), LBAP (VOG)
1071	Palmate Newt	<i>Lissotriton helveticus</i>	WCA5, Bern
1200	Common Toad	<i>Bufo bufo</i>	WCA5, S7, Bern, LBAP (VOG)
1770	Smooth Newt	<i>Lissotriton vulgaris</i>	WCA5, Bern
<i>Vascular plants</i>			
251	Bluebell	<i>Hyacinthoides non-scripta</i>	WCA8
350	Goldilocks Buttercup	<i>Ranunculus auricomus</i>	LI(SEWBRcC)
367	Round-leaved Fluellen	<i>Kickxia spuria</i>	RDB1 (Wales) - NT, LBAP (VOG)
560	Hairy St John's-wort	<i>Hypericum hirsutum</i>	LI(SEWBRcC)
563	Stinking Chamomile	<i>Anthemis cotula</i>	RDB1 (UK) - VU, LBAP (VOG), LI(SEWBRcC)
572	Herb-paris Greater Butterfly-orchid	<i>Paris quadrifolia</i> <i>Platanthera chlorantha</i>	LI(SEWBRcC) RDB1 (UK) - NT, LI(SEWBRcC)
848		<i>Iris foetidissima</i>	LI(SEWBRcC)
1002	Stinking Iris	<i>Ophrys apifera</i>	LI(SEWBRcC)
1002	Bee Orchid	<i>Eriophorum latifolium</i>	LBAP (VOG), LI(SEWBRcC),
1038	Broad-leaved Cottongrass	<i>Centaurea scabiosa</i>	LI(SEWBRcC),
1052	Greater Knapweed	<i>Polygonatum multiflorum</i>	LI(SEWBRcC)
1071	Solomon's-seal	<i>Veronica polita</i>	LI(SEWBRcC)
1071	Grey Field-speedwell	<i>Lathyrus aphaca</i>	RDB1 (UK) - VU, RDB2 (UK) - S
1084	Yellow Vetchling	<i>Oenanthe fistulosa</i>	S7, RDB1 (UK) - VU, LBAP (VOG), LI(SEWBRcC)
1138	Tubular Water-dropwort	<i>Ruscus aculeatus</i>	HDir, RDB1 (Wales) - VU, LI(SEWBRcC)
1211	Butcher's-broom	<i>Zannichellia palustris</i>	LI(SEWBRcC)
1218	Horned Pondweed	<i>Spergula arvensis</i>	RDB1 (Wales) - NT, RDB1 (UK) - VU, LBAP (VOG)
1235	Corn Spurrey	<i>Ceratophyllum demersum</i>	LI(SEWBRcC)
1289	Rigid Hornwort	<i>Meconopsis cambrica</i>	RDB2 (UK) - S
1297	Welsh Poppy	<i>Cirsium eriophorum</i>	LI(SEWBRcC), LI
1297	Woolly Thistle		

Distance from proposed development (m)	Common Name	Scientific Name	Conservation status
1297	Ivy-leaved Duckweed	<i>Lemna trisulca</i>	LI(SEWBRcC)
1297	Royal Fern	<i>Osmunda regalis</i>	LI(SEWBRcC)
1297	Wild Service-tree	<i>Sorbus torminalis</i>	LI(SEWBRcC)
1297	Lesser Bulrush	<i>Typha angustifolia</i>	LI(SEWBRcC)
1317	Bladderwort	<i>Utricularia australis</i>	LI(SEWBRcC)
1352	Upright Brome	<i>Bromopsis erecta</i>	LI(SEWBRcC)
1358	Charlock	<i>Sinapis arvensis</i>	RDB1 (Wales) - VU
1400	Black-poplar	<i>Populus nigra</i>	LI(SEWBRcC), LI(VC52)
1437	Hairy Violet	<i>Viola hirta</i>	LI(SEWBRcC), LI(VC43), LI(VC47), LI(VC49, LS), LI(VC50, LS), LI(VC52, LS)
1514	Yellow Archangel	<i>Lamiasstrum galeobdolon</i> subsp. <i>montanum</i>	INNS
1740	False Cleavers	<i>Galium spurium</i>	LBAP (VOG)
1742	Thin-spiked Wood-sedge	<i>Carex strigosa</i>	LI(SEWBRcC)
1770	Monk's-hood	<i>Aconitum napellus</i>	LBAP (VOG), LI(SEWBRcC)

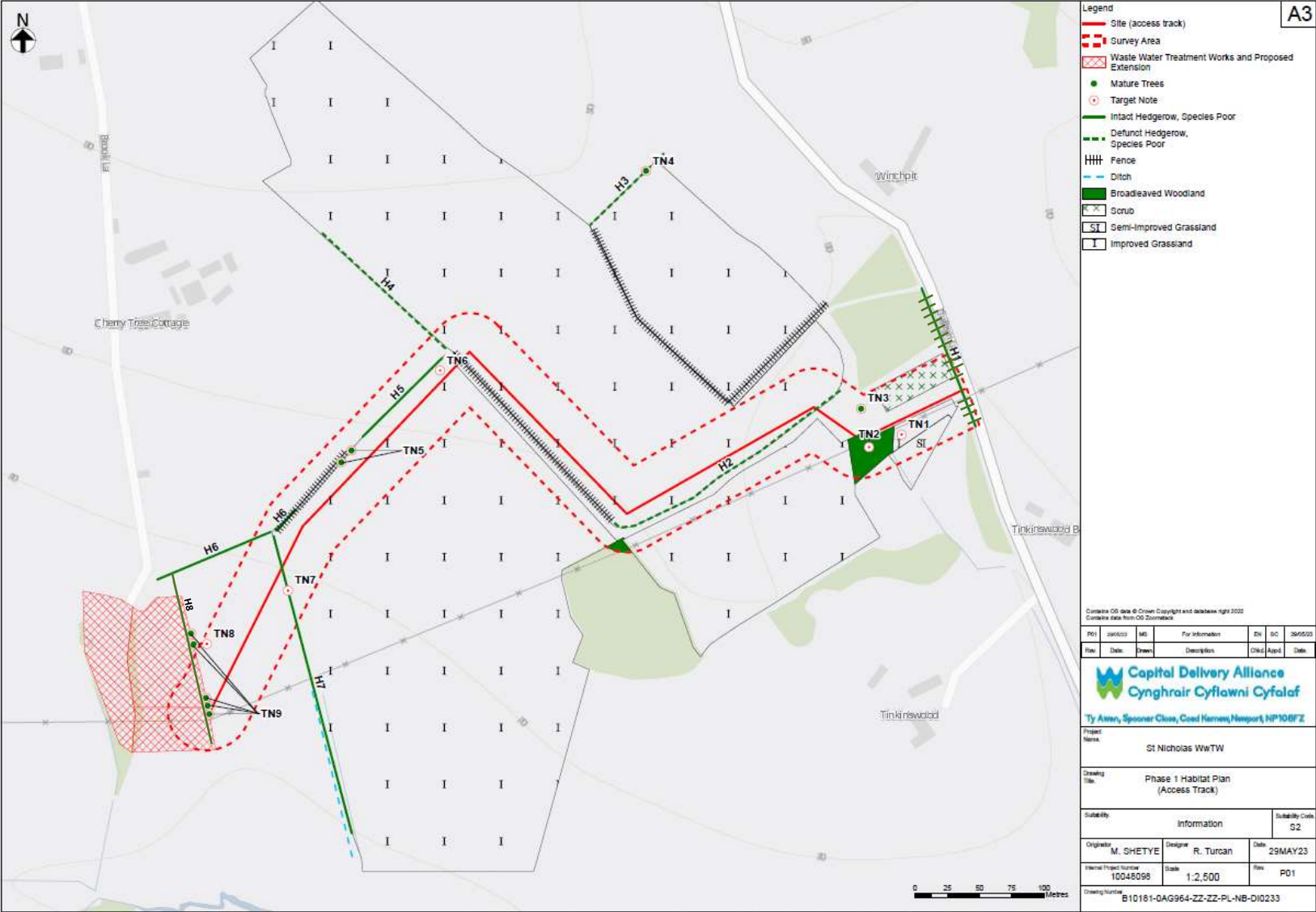


Abbreviations			
BA = Protection of Badgers Act	HDir = EU Habitats Directive Species	WCA1.1 = Wildlife and Countryside Act Schedule 1 Part 1 Species	LI (BIS) = Locally Important Species (as identified by local specialists) in BIS area
UKBAP = UK Biodiversity Action Plan Priority Species	NRW = Natural Resources Wales Priority Species	WCA5 = Wildlife and Countryside Act Schedule 5 Species	LI (BRYO-MON) = Locally or nationally scarce or rare bryophyte in Monmouthshire
UKBAP (R) = UK Biodiversity Action Plan Priority Species (Research only species)	RD1 (Wales) = Welsh Red Data Book listing based on IUCN guidelines	WCA8 = Wildlife and Countryside Act Schedule 8 Species	LI (VC41) = Locally Important Species (as identified by local specialists) in Vice County Glamorgan
BDir1 = EC Birds Directive Annex 1 Species	RD1 (UK) = UK Red Data Book listing based on IUCN guidelines	WCA9 = Wildlife and Countryside Act Schedule 9 Species	LI (VC41, LS) = Locally Scarce in Vice County Glamorgan
BDir21 = EC Birds Directive Annex 2.1 Species	RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce)	INNS = Invasive Non-Native Species	LI (VC41, LR) = Locally Rare in Vice County Glamorgan
BDir22 = EC Birds Directive Annex 2.2 Species	WBR (RSPB) = RSPB Welsh Red listed birds (not based on IUCN criteria)	WSG.P = Guidelines for the Selection of Wildlife Sites in South Wales - Primary species	LI (VC41, EX) = Extinct in Vice County Glamorgan
Bern = The Bern Convention on the Conservation of European Wildlife and Natural Habitats	WBAm (RSPB) = RSPB Welsh Amber listed birds (not based on IUCN criteria)	WSG.C = Guidelines for the Selection of Wildlife Sites in South Wales - Contributory species	LI (VC41, UR) = Under Recorded in Vice County Glamorgan
Bonn = The Bonn Convention on the Conservation of Migratory Species of Wild Animals Species	UKBR (RSPB) = RSPB UK Red listed birds (not based on IUCN criteria)	WVP = IUCN Threat Listing of Welsh Vascular Plants	

Abbreviations			
EPS = European Protected Species	UKBAm (RSPB) = RSPB UK Amber listed birds (not based on IUCN criteria)	LBAP (CDF) = Cardiff Biodiversity Action Plan Species	
S7 = Environment Act (Wales) Section 7 Species	LI (SEWBRc) = Locally Important Species (as identified by local specialists) in SEWBRc area		

# Appendix B

## Phase 1 Habitat Plan



# APPENDIX C

SINCs distant (<500m) from the proposed development


Name	Details	Distance (m) and direction
Dyffryn Gardens	The south-eastern part of Dyffryn Gardens estate comprising the Arboretum and Heather Bank.	637m south-east
Betty Lucas Wood	Mid-sized broadleaved woodland. Outer bank/inner ditch on north side; bank and ditch on south side.	654m south-west
Coed Y Graig	A managed broad-leaved woodland on a north-facing slope, with a canopy largely dominated by Ash, Sycamore, Beech and Larch.	880m south
Land along Nant Bran	Predominantly a large mixed woodland though parts appear ancient semi-natural. A large dry stream bed runs through the western side.	962m south-east
Land North-West of Coed Nant Bran	Details not available at the time of reporting	977m east
Coed Nant-Bran	Details not available at the time of reporting	983m east
Land North of Dyffryn	A large meadow, mostly poor semi-improved and grass dominated, but a strip comprising the northern quarter is unimproved neutral grassland.	1001m south-east
Land North of Little Hamston Farm	Details not available at the time of reporting	1083m south-west
Redland wood	Medium-sized broadleaved woodland, waterlogged in places,. Several small streams run through.	1097m west
Land North-West of Whitton Rosser Farm	Grassland – wet; woodlands-broadleaved	1113m south-west
Land South of Blackland Farm	Details not available at the time of reporting	1158m south-west
Land to West of Dyffryn	Details not available at the time of reporting	1213m south
Land North of Whitton Rosser Farm	Large triangular-shaped fen meadow with semi-natural broadleaved woodland fringe on the northern and eastern sides.	1214m south-west
Amelia Trust Woodland Pond	Details not available at the time of reporting	1415m south-west
Coed Quinnet	Two large fields of damp semi-improved neutral grassland with many clumps of bramble and many young ash (the majority of which are distressed or dying) and occasional semi-mature ash and English oak.	1483m south-west





Name	Details	Distance (m) and direction
Coed Maesyfelin	Details not available at the time of reporting	1521m south-east
Beechwood	Details not available at the time of reporting	1548m east
East of Homri Farm	This site is a small copse of very wet alder-willow carr with considerable standing water below the trees. Sub-mature alders form the bulk of the canopy above a tall understorey of grey willow.	1550m north
East of Glyncory Water Works	Details not available at the time of reporting	1550m north
The Downs	Large area of common land south of A48. Predominantly flat and free draining; tall species-rich hedges around western and eastern sides, open to road in north.	1550m north-east
Land South of Little Hamston	Details not available at the time of reporting	1577m south-west
Cottrell Wood	Cottrell Wood is a good example of W8 ash-maple woodland lying on a steep north and north-east facing slope at the northern edge of a golf course. It is variable in quality and seems to be best developed on the north-facing slopes over what appear to be the remains of small, long-disused pits and quarries.	1588m north-west
Goldsland Wood	Details not available at the time of reporting	1767m south-east
Dyffryn Golwch	Details not available at the time of reporting	1811m south
Kingsland	A large wet calcareous wood in two blocks bisected by a little-used track on the lower slopes of a hill. It is mature W7 alder woodland overlying flushed ground which is criss-crossed by many small streams and seeps.	1854m north-west
North of Coed Quinnet	Two large fields of damp semi-improved neutral grassland with many clumps of bramble and many young ash (the majority of which are distressed or dying) and occasional semi-mature ash and English oak.	1928m south-west
East of Dyffryn Springs	Details not available at the time of reporting	1902m south-east
Great Hamston	Details not available at the time of reporting	1965m south
Amelia Trust Dew Pond	Details not available at the time of reporting	1926m south-west



# Appendix D

Target Note descriptions and photographs

Target Note Reference Number and Description	Photograph
1 – Large extensive rabbit warren associated with single Hawthorn tree and dense Common Nettle patch, with Daffodil and Lesser Celandine	

Target Note Reference Number and Description	Photograph
2 – Disturbed ground with construction materials	
3 – Large Pedunculate Oak of age and structure suitable to support bat roosts	




Target Note Reference Number and Description	Photograph
4 – Large Sycamore of age and structure suitable to support bat roosts	
5 – Two large sycamores, the eastern one was of an age and structure suitable to support bat roosts with evidence of peeling bark, decaying woodpecker holes and rot holes.	

Target Note Reference Number and Description	Photograph
6 – Rock Piles	
7 – Flush/field drain, 8-10m south of the gateway flowing into ditch further to the south	



Target Note Reference Number and Description	Photograph
8 – Rocky outcrop associated with dense stand of Common Nettles.	 A photograph showing a grassy field with a rocky outcrop. To the left of the rocks is a dense stand of common nettles. In the background, there is a line of trees and a fence.

Target Note Reference Number and Description	Photograph
<p>TN9 – Five Oak trees within Hedgerow H8, previously described as trees 5-9 (south to north) and which have had an aerial inspection with an endoscope to assess their bat roost potential<sup>25</sup>. Tree 5 was not climbed. Tree 6's features had filled with water and were considered unsuitable; Tree 7 features were described as moderate potential but no evidence was found; and Tree 8 and 9 had no suitable features despite their age and structure. Tree 5 and 7 are undergoing further emergence surveys at the time of reporting. Photograph is of gateway adjacent to tree T5.</p>	

<sup>25</sup> Arcadis (2023) St Nicholas – Bat Tree Climbing Memo Report