

Dŵr Cymru Welsh Water
Minera CSO
Ecological Appraisal Report

241138-06

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This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Introduction

1.1 Background

This Ecological Appraisal has been prepared by Ove Arup and Partners ('Arup') on behalf of Dŵr Cymru Welsh Water (DCWW) and supports a planning application for a new vehicular access track to the site of the Minera Combined Sewer Overflow (CSO), hereafter referred to as the Application Site.

The proposed development would improve the existing access so that it is compatible with DCWW maintenance vehicles, which would comprise small vans and light good vehicles, allowing for safer ingress and egress. The Application Site is located at National Grid Reference (NGR) SJ2679252001 within Wrexham County Borough Council's administrative area. The Application Site is shown in Figure 1.

1.2 Application Site

The Application Site is located within a broad-leaved woodland a short distance west of the village of Minera which is located on the outskirts of the larger village of Coedpoeth, 4 miles to the west of Wrexham. The wider site comprises scrubland, self-seeded woodland and is bounded by Church Road to the west, north and east. There is an existing CSO at the site that DCWW currently maintain. Access is achieved via a small pedestrian gate off Church Road. The existing access is on the inside shoulder of a sharp corner in the road. The Application Site is adjacent to a stream to the east which flows into the River Clywedog which is 160m to the south.

1.3 Description of development

The development being carried out under permitted development rights relates to the replacement of a malfunctioning CSO and associated minor operations, including installation of a kiosk and replacement access track.

The improved access track proposed under the planning application is the only component of the wider development which requires planning consent. The overall area of the proposed new access track is 61m².

1.4 Purpose of this report

This Ecological Appraisal outlines the results of the ecological desk study, Extended Phase 1 Habitat survey, hedgerow assessment, preliminary ground level tree assessment for bats, tree climbing survey, otter survey, water vole survey, badger survey and arboricultural survey. It aims to provide information for the planning application. This report details the methodologies used, provides a description of the designated sites, species records, the habitats and the potential for legally protected or otherwise notable species (e.g. Species of Principal

Importance for the Conservation of Biodiversity listed in response to Section 7 of the Environment (Wales) Act 2016), within the site and its vicinity.

This document also assesses the impacts of construction and operation of the development, and recommends any further ecological surveys, mitigation and/or enhancements, as required.

1.5 Structure of the Report

- Section 2 provides information on the data and methodology used in the desk study, field survey and assessment;
- Section 3 reports the baseline information and survey results;
- Section 4 gives an evaluation of ecological receptors on site;
- Section 5 documents the assessment of the potential effects occurring to ecological receptors;
- Section 6 outlines the mitigation and recommendations for the works; and,
- Section 7 provides a final assessment of the residual effects and conclusions.

1.6 Legislation and national policy

1.6.1 Legislation

Relevant legislation to protect habitats and species

A framework of international/European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. The following legislation exists to protect habitats and species of nature conservation importance:

- i. The Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitat Regulations) which transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into UK law;
- ii. The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) (the Wild Birds Directive);
- iii. Wildlife and Countryside Act 1981 (as amended) (WCA);
- iv. Natural Environment and Rural Communities Act 2006 (NERC);
- v. The Countryside and Rights of Way Act 2000;
- vi. The Hedgerow Regulations 1997; and
- vii. Protection of Badgers Act 1992.

These pieces of legislation include a number of offences relating to protected species and requirements for licences to allow construction works to proceed. In addition, the Habitats Regulations set out the requirement for the consideration of the potential effects of a project on European designated sites. The legislative context is provided in Appendix A.

The relevant legislation and policy relating to specific species potentially affected by this proposed development is further detailed in Table 8.

The Natural Environment and Rural Communities (NERC) Act 2006

Biodiversity is given some protection through Section 40 of the Natural Environment and Rural Communities (NERC) Act of 2006. Under the NERC Act 2006 public authorities have a legal responsibility to conserve biodiversity. The duty is set out in Section 40 of the Act which states that:

‘Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’.

The wording of Section 40 means that the council as a public authority has a duty to take into account conserving biodiversity in discharging any of its functions: and that responsibility for meeting this obligation lies both with the relevant departments and across the council as a whole, from the management of land to development control and maintenance.

The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 sets out Wales’ approach to planning and managing natural resources at a national and local level in Part 1, with a general purpose linked to statutory ‘principles of sustainable management of natural resources’ defined within the Act. The Act includes a duty on all public authorities to have regard to the conservation of biodiversity in the exercise of their functions. This duty applies to government bodies, local authorities and statutory undertakers.

Section 6 of the Act places a duty on public authorities to ‘seek to maintain and enhance biodiversity’ so far as it is consistent with the proper exercise of those functions. In doing so, public authorities must also seek to ‘promote the resilience of ecosystems’. The duty replaces the section 40 duty in the Natural Environment and Rural Communities Act 2006 (NERC Act 2006), in relation to Wales, and applies to those authorities that fell within the previous duty. Public authorities are also required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

Section 7 of the Act replaces the duty in section 42 of the NERC Act 2006, for the Welsh Ministers to publish lists of Habitats and Species considered to be of Principal Importance for the Conservation of Biological Diversity. The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitat included in any list published under this section, and encourage others to take such steps.

The Well-being of Future Generations Act 2015

The Well-being of Future Generations Act 2015 is concerned with improving the social, economic, environmental and cultural well-being of Wales. The Act recognises the importance of nature and its biodiversity. The Resilient Wales is one of seven well-being goals, and will help with nature recovery in Wales. The Resilient Wales goal states that:

'A nation which maintains and enhances a bio-diverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).'

The Act establishes Public Services Boards (PSBs) for each local authority area in Wales. PSBs are tasked with improving the economic, social, environmental and cultural well-being of its area by working to achieve the well-being goals

The UK level Biodiversity Action Plan (UKBAP) has been replaced by the UK Post-2010 Biodiversity Framework which focuses on the four individual countries of the United Kingdom and Northern Ireland.

Particular attention has been paid to Section 7 priority species and habitats and Wrexham County Council's (WCC) Biodiversity Action Plan.

1.6.2 National Planning policy

Planning policy Wales (PPW)

The Planning Policy Wales (PPW)¹ document sets out the approach to be taken through the planning system in Wales, and provides the policy framework for the preparation of local development plans (LDPs) intended to contribute towards 'sound economic development, the conservation of natural assets and to the quality of life of individuals and communities'.

Chapter 5 of the PPW addresses 'Conserving and Improving the Natural Heritage and Coast', and sets out the Welsh Assembly Government's objectives for the conservation and improvement of the natural heritage planning policies, and the land use policies that support them. Importantly it states that 'Local planning authorities must address biodiversity issues, insofar as they relate to land-use planning, in both development plans and development control decisions.' PPW requires local planning authorities to set out within their development plans a policy framework for the conservation and enhancement of the natural heritage specific to the local area and includes policies for coastal areas where relevant. It is important, therefore, to align development proposals not only to national policy, but to local planning policies contained within the relevant LDP.

Technical Advice Note 5 (TAN5)

Technical Advice Note 5 (TAN5) provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. In essence it sets out the manner in which planning

¹ Welsh Government (2016) Planning Policy Wales (Edition 9, November 2016)

authorities should comply with their duty under the NERC Act 2006. It is intended to be used in parallel with Planning Policy Wales (2016).

TAN5 contains a set of key principles. One of these principles is that the town and country planning system in Wales should “integrate nature conservation into all planning decisions” and another is that it should look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally.

1.6.3 Local Policy

Local Development Plan

Local Development Plans must be produced by every local planning authority in Wales. These Plans include policies relating to biodiversity and nature conservation. These generally reflect and build on the planning policy guidance set out in Planning Policy Wales.

Currently the proposed ‘Wrexham Local Development Plan 2 (LDP2) 2013 – 2028’² is at consultation, and the ‘Wrexham Unitary Development Plan 1996 – 2011’³ is currently the document used to set out the overall planning policies in Wrexham. The nature conservation policies which are relevant to this development are as follows:

POLICY EC4: Hedgerows, Trees and Woodland

Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.

POLICY EC5: Special Landscape Areas

Within Special Landscape Areas, priority will be given to the conservation and enhancement of the landscape. Development, other than for agriculture, small-scale farm-based and other rural enterprises, and essential operational development by utility service providers, will be strictly controlled. Development will be required to conform to a high standard of design and landscaping, and special attention will be paid to minimising its visual impact both from nearby and distant viewpoints.

²

http://www.wrexham.gov.uk/english/planning_portal/plan_policy/local_development_plan_new.htm

³ Wrexham County Borough Council (2005) Wrexham Unitary Development Plan 1996 - 2011

POLICY EC6: Biodiversity Conservation

Development either within or close to sites of biodiversity interest will only be permitted where it can be clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve the biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves, will be supported.

Policy EC7: Conservation Areas

Within, and in close proximity to, conservation areas, the priority will be to preserve and/ or enhance those buildings, structures, streets, trees, open spaces, archeological remains, views, and other elements which contribute to the unique character of the area. New buildings and alterations or additions to existing buildings in conservation areas, whether listed as of special architectural or historic interest or not, must reflect the design and character of the area as a whole and the form, scale, detailing and materials of existing buildings.

Policy EC13: Surface Water Run-off

Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted.

Policy EC14: Protection of Controlled Waters

Development which would have an unacceptable adverse impact upon the capacity, flow, quality or availability of controlled waters and associated land will not be permitted.

2 Methodology

2.1 Desk Study

A desk study was carried out to identify statutory designated sites within 2km of the Application Site (see Figure 1). The Multi-Agency Geographic Information for the Countryside (MAGIC) website⁴ was reviewed for information on nationally and internationally designated sites of nature conservation importance. The search included Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites, and Sites of Special Scientific Interest (SSSIs).

In addition to this, a biodiversity information request was submitted to the North Wales Environmental Information Centre (Cofnod), and report obtained on 28th January 2016. The biodiversity information requested included:

- Protected⁵ and priority⁶ species and other species of conservation concern up to 2km from the Application Site;
- Locally important species⁷ and invasive species records up to 1km from the Application Site;
- Local site designations i.e. Sites of Importance for Nature Conservation (SINC) up to 1km from the Application Site.

2.2 Extended Phase 1 Habitat Survey

The Phase 1 Habitat Survey (JNCC, 2010)⁸ is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas (including intertidal) of land on the basis of the vegetation and species present. This method of survey provides information on the habitats in the survey area, using a standard set of habitat definitions for classifying areas of land based on the vegetation present. The Extended Phase 1 Habitat survey also provides additional information through recording signs of legally protected species, and in assessing the potential for protected species to occur in, or adjacent to the site.

An Extended Phase 1 Habitat Survey was undertaken on the 23rd March 2016 and 27th July 2016 by a suitably qualified ecologist and assistant, this was due to access permission not being gained for the entire area during the initial site survey. The aims of the survey were to identify the habitats present and any ecological constraints or features of ecological interest within the site that may be affected based on the scope of the works. For the purpose of the Extended Phase 1

⁴ www.magic.gov.uk

⁵ EU and UK legally protected species under the Conservation of Habitats and Species Regulations 2010 (as amended) and Wildlife and Countryside Act 1981 (as amended).

⁶ Species of Principal Importance in Wales listed in response to Section 7 of The Environment (Wales) Act 2016.

⁷ Local Biodiversity Action Plan species, locally rare and scarce species (as identified by local experts).

⁸ Joint Nature Conservation Council (2010) Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit (ISBN 0 86139 636 7).

Habitat survey, a buffer of at least 50m around the Application Site has been included within the scope of the study. The results of the habitat survey area is illustrated in Figure 2.

The weather conditions during the surveys are documented in Table 1.

Table 1 Weather conditions during the survey

Date	Survey type	Temperature (°C)	Wind Speed (Bft)	Wind Direction	% Cloud Cover	Conditions
23/03/2016	Extended Phase 1 Habitat survey	12	2	NE	100	Dry
27/07/2016	Extended Phase 1 Habitat survey	20	1	S	50	Sunny

All accessible areas of the site were walked and relevant habitat types classified according to their vegetation types and mapped. Predominant flora species within each habitat were also recorded. Target Notes (TNs) were used to identify areas of particular interest including the potential for protected species to be present. The Target notes are shown in Figure 1 and listed in Appendix B. The survey included the following:

- a visual inspection of trees and other structures to assess potential for bat roosts;
- a search for signs of badger (*Meles meles*) activity, such as setts, tracks and latrines within 50 metres of the proposed works;
- a search for signs of otter (*Lutra lutra*) activity, such as laying up sites, footprints, spraints and holts within 100 metres upstream and downstream of the proposed works;
- a search for water vole (*Arvicola amphibius*) activity, such as burrows, latrines, feeding stations and lawns within 100 metres upstream and downstream of the proposed works; and
- an assessment of habitat potential for reptiles and amphibians, in particular great crested newts (*Triturus cristatus*) Habitat Suitability Index Assessments following published methods⁹.

A search was also undertaken for evidence of legally controlled invasive plant species within and adjacent to the Application Site. These invasive plants are those listed on Schedule 9 of the Wildlife & Countryside Act 1981, and subject to strict legal control.

⁹ Amphibian and Reptile Groups of the United Kingdom, ARG UK Advice Note 5, Great Crested Newt Habitat Suitability Index, May 2010.

2.3 Hedgerow Survey

Hedgerows within the site were assessed during the Extended Phase 1 Habitat survey on 27th July 2016, in relation to the criteria for ecologically impartial hedgerows under the Hedgerows Regulations 1997.

Information recorded for each hedgerow included:

- Height and width of hedgerow (metres);
- Species composition;
- Number of woody species;
- ‘Associated features’ (According to sub-paragraph 4, Section 7 of Part II of Schedule 1 of the Hedgerow Regulations 1997);
- Whether the hedgerow is on common land; and
- The presence of adjacent Public Rights of Way (PRoW).

2.4 Tree survey

A Tree Survey was undertaken by Treescene Arboricultural Consultants (see Appendix C) on the 17th October 2016, following the recommendations of British Standards 5837:2012¹⁰ and current good arboricultural practice. The survey entailed a visual inspection from ground level of all trees over 150mm diameter.

The following information was gained during the survey:

- Each tree (or group of trees) was numbered and, where instructed, for future identification on site, was tagged using small durable metal or plastic tags.
- Due to variations of existing ground levels through the site, height dimensions were estimated and given in metres.
- Trunk/stem diameters were measured at 1.5 metres above ground level, or immediately above the root flare for multi-stemmed trees.
- Estimate branch spread was taken in metres from the centre of the trunk, at the four cardinal points of a compass, to achieve an accurate representation of crown shape.
- An assessment of a tree’s age classification was made in terms of its maturity within the site’s landscape.
- An assessment of a tree’s physiological condition was made as good, fair, poor, dead.
- Data on the structural condition of the tree e.g., collapsing, leaning and the presence of any decay or physical defect.
- Preliminary management recommendations including further investigation of suspected defects that may require more detailed assessment and potential for wildlife habitat.

¹⁰ BS 5837:2012 “Trees in relation to Construction”

- An assessment of a tree's future life expectancy was made as <10, 10-20, 20-40 or >40 etc.

The survey informed the arboriculturalists 'recommendations for Tree Protection during Development' (see Appendix D).

2.5 Bat Surveys

2.5.1 Preliminary Ground Level Assessment of Buildings / Trees

All trees within the site boundary were subject to a preliminary assessment from ground level to appraise their potential to support roosting bats on 23rd March 2016 and 27th July 2016. A second visit was undertaken due to lack of access permission to the entire survey area during the initial survey.

The purpose of the assessment from the ground was to locate features in the tree that may be suitable for roosting bats. Examples of the type of features that are regularly used by roosting bats include:

- Rot holes and cavities caused by decay and infection;
- Splits and cracks caused by damage to trees;
- Cavities caused by close association of branches and ivy.

Features were categorised in accordance with Bat Conservation Trust (BCT) Survey Guidelines¹¹:

- High potential - A structure or tree 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 and surrounding habitat (Category 1*);
- Moderate potential - A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (Category 1);
- Low potential - A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions 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 or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential (Category 2); and

¹¹ Collins, J. (2016). Bat Surveys: Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). The Bat Conservation Trust, London.

- Negligible potential - Negligible habitat features on site likely to be used by roosting bats (Category 3).

2.5.2 Tree Climbing Survey

A tree climbing survey for bats was undertaken on 21st October 2016. This involved inspecting PRFs in the trees, previously identified from the ground level tree assessments, using a rope and harness tree-climbing technique. The PRFs were closely inspected using torches, inspection mirrors and/or an endoscope (Videostik) to examine the interior of the features.

If there was evidence of bats was found during the climbing survey, or the presence of roosting bats could not be ruled out, further surveys would then be recommended by the surveyor.

2.6 Otter survey

An otter survey was undertaken on the 23rd March 2016 and 27th July 2016. The survey method was adapted from best practice survey guidelines^{12 13} and included both a habitat suitability assessment and a presence/absence survey.

2.6.1 Habitat Suitability Assessment

Habitat suitability assessments were carried out at each waterbody/watercourse visited, and based on the following criteria:

- Proximity of site to habitats meeting the species' requirements for shelter, foraging and breeding;
- Degree of modification to waterbody/watercourse potentially resulting in negative impacts upon otters, e.g. canalisation or realignment;
- Levels of site disturbance, e.g. proximity to Public Rights of Way, farm vehicle access tracks or road traffic;
- Levels of visible pollution potentially impacting upon prey species; and,
- Potential for otters to use culverts, bridges and dry watercourses for foraging, commuting and dispersal.

Habitat suitability was measured according to the above criteria and defined as high, moderate, low or negligible as outlined in Table 2.

¹² Chanin, (2003) Ecology of the European Otter. Conserving Natura 2000 Rivers. Ecology Series No.10. Life in UK Rivers, EN, CCW, EA, SEPA, SNH & SNIFFER 2003.

¹³ Crawford, A (2010) Fifth Otter Survey of England 2009 -2010 - Technical Report. Environment Agency

Table 2 Habitat Suitability Criteria for Otters

Habitat Suitability	Shelter Requirements	Food Supply	Modification & Disturbance	Hydrology	Pollutants
High	Many suitable habitat features adjacent to watercourse.	Suspected presence of abundant prey, particularly fish species.	Minor man-made modification of watercourse habitat and disturbance from the public e.g. dog walking.	Watercourse with fast to moderate flow velocity and more than 1 m deep.	‘Good’ or above chemical or biological water quality.
Moderate	Several suitable habitat features adjacent to watercourse.	Suspected presence of sufficient prey, particularly fish species.	Intermediate man-made modification of watercourse habitat or disturbance from the public e.g. frequent dog walking.	Watercourse with slow to moderate flow velocity or less than 1 m deep.	‘Fair’ chemical or biological water quality.
Low	Few suitable habitat features adjacent to the watercourse.	Suspected scarcity of prey.	Major man-made modification of watercourse habitat or disturbance by the public e.g. frequent dog walking.	Watercourse with slow to moderate flow velocity and less than 1m deep.	‘Fair’ or below chemical or biological water quality.
Negligible	No suitable habitat features.	No prey species present.	Major man-made modification of watercourse habitat and disturbance by the public e.g. frequent dog walking.	Dry with no indication of a waterbody present on site.	Low water quality with indications of pollution.

2.6.2 Presence/absence survey

The field signs that were searched for included: spraints, anal jelly, holts, laying-up sites, bank slides, runs, tunnels, prey remains and footprints. Features that have high potential to be attractive to otters were examined, including: suitable bridges, bases of large trees, dense vegetation, confluences of water bodies and boulders.

Resting areas for otters are usually referred to as either a holt (usually a hole in the ground covered by vegetation or under the roots of a bankside tree) or a laying up site (an uncovered laying up or nest like structure).

2.7 Water vole survey

A water vole survey was undertaken on the 23rd March 2016 and 27th July 2016. The survey method for water voles was based on the best practice survey guidelines in the Water Vole Conservation Handbook (Strachan, Moorhouse, & Gelling, 2011). Banks of water bodies were surveyed from a minimum of two metres from the waters' edge.

2.7.1 Habitat Suitability Assessment – Water voles

The assessment of habitat suitability indicates how likely water voles are to use a site given the present habitat conditions. Habitat suitability was assessed from observing the features of each water body, with consideration to the ecology and habitat requirements of water voles.

Habitat suitability assessments were carried out at each water body/watercourse visited with sites subsequently defined as being of high, moderate or low suitability based on the following criteria:

- Rate of water flow;
- Bank profiles;
- Degree of shading from overhanging trees;
- Extent of suitable emergent and bankside herbaceous vegetation in providing shelter, food and nesting material;
- Degree of cattle poaching (i.e. extent of damage to banks resulting from trampling by cattle);
- Levels of site disturbance, e.g. proximity to public rights of way, farm vehicle access tracks or road traffic;
- Potential for the water body to dry out;
- Suitability of bank substrates for burrowing; and,
- Water quality.

Examples of habitat suitability assessments are as follows:

High Quality

Typical high quality water vole habitat is a slow-flowing watercourse, less than 3m wide and 1m deep with moderately steep banks, minimal shading by trees and shrubs and luxuriant growth of emergent and bankside herbaceous vegetation to provide shelter and an abundance of food and nesting material.

Moderate Quality

Moderate quality water vole habitat would consist of a combination of the features associated with both high and low habitat suitability. For example, the flow and bank type may be suitable; however heavy grazing by livestock may reduce the cover of herbaceous vegetation and trample suitable habitat for burrowing.

Low Quality

Factors which indicate that a habitat is of a low suitability for water vole include heavy shading by overhanging trees and/or shrubs reducing the cover of emergent

and bankside vegetation and thus the availability of water vole food plants. Other factors that indicate habitat of low suitability include widely fluctuating water levels, seasonal drying out of the watercourse channel and banks that are unsuitable for burrowing.

Negligible

A negligible habitat suitability would be where there is either no water body present for example, a ditch which has completely overgrown and would not hold water. An example of this would be a ditch which has a double hedge and is no longer managed and therefore the water body has filled in. Settlement pools or ditches which are visibly polluted and low water quality and obviously their purpose is to act as a buffer to collect polluted material from industry.

2.7.2 Presence / absence survey – Water voles

At each water body a search for the following field signs was undertaken: faeces, latrines, feeding stations, burrows, footprints. Any evidence found was recorded and mapped.

2.8 Badger survey

A full badger *Meles meles* survey was conducted along all suitable boundaries of the site and within at least 30metres of the site boundary on 27th July 2016. The site was surveyed for evidence of badger activity in accordance with the standard methodology for Surveying Badgers¹⁴. Dedicated searches were made for signs of badger activity such as sett holes, footprints, latrines, hairs and paths which constitute characteristic evidence of badger presence.

The Surveying Badgers methodology defines a sett as “any structure or place which displays signs indicating current use by a badger”. Harris et al.¹⁴ also interprets current use as having been used at any point in the last 12 months.

Where a sett was recorded, it was classified in accordance with the following criteria:

- i. Main – normally the focal sett for a badger social group. Generally always occupied, main setts usually have several active holes with radiating tracks, latrines and other signs of activity. The actual number of holes can vary greatly, depending on social group size and soil conditions.
- ii. Annexe – a secondary sett, close to the main sett. It will normally be connected to the main sett with very obvious tracks. Annexes may not be occupied constantly, even when the main sett is very active.
- iii. Subsidiary – occurring at a greater distance from the main sett and not as clearly linked to it as an annexe. These setts will fall clearly within the territory of a social group and may be seasonally used by badgers.
- iv. Outlier – less frequently used, these setts may be colonised by other species when not in use by badgers. Outliers may represent a temporary sett, or a habitation for migrating individuals, or those excluded from a social group.

¹⁴ Harris, S. Cresswell, P and Jefferies, D. (1989) Surveying Badgers. The Mammal Society Publication No. 9. Mammal Society.

In addition to classifying each sett, the number of entrances was counted and their status recorded using the following criteria;

- i. Active: being clear of any debris or vegetation, are obviously in regular use and may or may not have been excavated recently.
- ii. Partially-used: not in regular use and have debris such as leaves and twigs in the entrance, or have moss and/or other plants growing in or around the entrance. Partially-used holes could be in regular use after a minimal amount of clearance.
- iii. Disused: not been in use for some time, are partially or completely blocked and could not be used without a considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be and the remains of the spoil heap, which may be covered in moss or plants.

2.9 Field survey limitations

The findings presented in this report represent those at the time of the survey and reporting, and data collected from available sources. Ecological surveys can be limited by factors affecting the presence of plants and animals, such as the time of year, migration patterns and behaviour. Absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

For the initial site survey on the 23rd March 2016 land ownership details had not been gathered in time to gain access permission to the entire survey area. Therefore another survey was undertaken on the 27th July 2016. Despite this issue, both surveys were undertaken at an appropriate time of year.

2.10 Assessment Methodology

The ‘Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal’ (referred to in this report as the ‘CIEEM guidelines’)¹⁵ form the basis of the impact assessment presented in this report. These guidelines set out a process of identifying the value of ecological receptors and then characterising the impacts that are predicted. They go on to discuss the impacts on the integrity or conservation status of the receptor, the proposed mitigation and residual impacts.

The CIEEM guidelines recommend that the value of ecological receptors or features is determined based on a geographic frame of reference. For this assessment the following geographic frame of reference is used:

¹⁵ CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

- International and European;
- National (i.e. Wales);
- Regional (i.e. North Wales);
- Metropolitan, County, vice-county or other local authority-wide area (i.e. Wrexham); and,
- Local (i.e. within circa 5km).

In accordance with CIEEM guidelines, actions resulting in changes to an ecological feature would be termed as an ‘Impact’ e.g. loss of habitat. An ‘Effect’ is deemed to be the outcome to an ecological feature from an impact e.g. reduction to species population due to habitat loss.

When describing impacts reference is made to the following:

- Positive or negative – i.e. a change that improves or reduces the quality of the environment according to nature conservation objectives and policy;
- Extent – i.e. the area over which an impact occurs;
- Magnitude – i.e. the size of an impact in quantitative terms where possible;
- Duration – i.e. the time for which an impact is expected to last;
- Timing - i.e. whether impacts occur during critical life stages or seasons;
- Frequency – i.e. how often impacts occur; and,
- Reversibility – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible.

In accordance with the CIEEM guidelines, a significant effect, in ecological terms, is defined as ‘An effect that either supports or undermines biodiversity conservation objectives¹⁶ for ‘important ecological features’¹⁷.

It is important to note, however, that in accordance with the CIEEM guidelines, the actual determination of whether an effect is ecologically significant is made irrespective of the value of the receptor in question. In this respect, the CIEEM methodology differs from some other approaches to EIA.

Furthermore, when carrying out an evaluation of significant effects, the precautionary principle should be adopted. Whereby if sufficient information is unavailable to assess an effect, a significant effect should be assumed and/or uncertainty acknowledged in the assessment.

¹⁶ Objective for the conservation of biodiversity (e.g. specific objective within a management plan or broad objectives of policy).

¹⁷ Ecological features requiring specific assessment within EcIA. Ecological features can be important for a variety of reasons (e.g. quality and extent of designated sites or habitats, habitat / species rarity).

3 Baseline Conditions

3.1 Desk Study

3.1.1 Statutory Designated Sites

The search using MAGIC showed that there are two internationally designated sites within 2km of the application site, these are:

- Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC;
- Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SPA.

Additionally a search was undertaken for nationally designated sites within a 2km search area, this search identified that the Ruabon/Llanysilio Mountains and Minera SSSI lies 330m south-west of the proposed works. There are no National Nature Reserve (NNR) or Local Nature Reserves (LNR) within the search area.

A description of the statutory designated sites and their features of interest are given in Table 2.

Table 3 Details of the statutory designated sites of nature conservation importance

Site	Approximate distance and direction from centre point	Description
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC	480m West / South-West.	The Berwyn and South Clwyd Mountains SAC is a large upland site (27,132 ha), the largest area of blanket bog and European dry heath in Wales. It comprises three discrete sites, Berwyn SSSI, Llandegla Moor SSSI, and Ruabon and Llantysilio Mountains and Minera SSSI. All of these sites are predominantly a mixture of dry heath and blanket bog vegetation with patches of transition mires and quaking bogs vegetation found as an intricate mosaic, usually on acidic rock types, and can together be described as upland moorland.
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SPA	767m West.	Berwyn is the most important upland in Wales for breeding birds. It supports a wide range of species including internationally significant numbers of hen harrier (<i>Circus cyaneus</i>), merlin (<i>Falco columbarius</i>), peregrine (<i>Falco peregrinus</i>) and red kite (<i>Milvus milvus</i>), as well as significant proportions of the Welsh populations of other species including short eared owl (<i>Asio flammeus</i>), golden plover (<i>Pluvialis apricaria</i>), red grouse (<i>Lagopus lagopus</i>) and black grouse (<i>Tetrao tetrix</i>).
Ruabon/Llanysilio Mountains and Minera SSSI	330m SW	Designated for moor, limestone and neutral grassland, upland breeding birds, plants and mines/caves containing bats. Three geological sites are encompassed within the

Site	Approximate distance and direction from centre point	Description
		site boundary: The Minera Caves, The Creigiau Egiwyseg and The Eglwyseg Mountain.

The citations for the European designated sites (SAC and SPA) were downloaded from the Natural Resources Wales (NRW) website on 20th September 2016.

3.1.2 Non- Statutory designated sites

The biodiversity information search produced by Cofnod identified locally designated sites within 1km of the proposed works. Site reports for these local wildlife sites were received from Wrexham County Borough Council on the 23rd September 2016. The proposed works are within the boundary of the Pen-y-Nant Wildlife Site. Table 3 details the site description of these local wildlife sites and their location in relation to the proposed works.

Table 3 Details of the Local Wildlife Sites

Site	Approximate distance and direction from centre point	Site description
Pen-y-Nant, Minera	Site is within the boundary of this Wildlife Site.	Site description ¹⁸ : Unimproved rank grassland on steep slopes down to a strip of woodland along a stream. False oat-grass (<i>Arrhenatherum elatius</i>) and black knapweed (<i>Centaurea nigra</i>) are the major species in the grassland. Within the marshy area ragged robin (<i>Lychnis flos-cuculi</i>) and devil's-bit scabious (<i>Succisa pratensis</i>) occur. The woodland canopy is mostly sycamore (<i>Acer pseudoplatanus</i>) and alder (<i>Alnus</i> sp.) with holly (<i>Ilex aquifolium</i>) and hawthorn (<i>Crataegus monogyna</i>) beneath. There is bluebell (<i>Hyacinthoides non-scripta</i>) and wood-sorrel (<i>Oxalis stricta</i>) within the ground flora.
New Brighton	493m South.	Site description ¹⁹ : This large site includes a disused lead mine, dismantled railway and an old silica rock quarry, which is still partly in use. The quarry has been recolonised by a mosaic of birch scrub and heather, gorse (<i>Ulex</i> sp.) and bracken (<i>Pteridium aquilinum</i>). Within the quarry there are damp patches with soft rush. It is a good area for birds. Directly north of the quarry there is a steep north facing slope with rowan and bracken, and to the west there is a large mosaic of bracken, heather and rowan. Common spotted orchid (<i>Dactylorhiza fuchsia</i>) occurs here. The semi-improved acid grassland is dominated by sheep's sorrel (<i>Rumex acetosella</i>), Yorkshire fog (<i>Holcus lanatus</i>) and heath bedstraw (<i>Galium saxatile</i>). The lead mines to the north have an old railway line with willow scrub and some semi-improved grassland. There are large spoil mounds recolonised by birch scrub and dry heath with yellow-wort (<i>Blackstonia perfoliata</i>),

¹⁸ Wrexham County Borough Council (2008) Site Report. Site No. W249. Pen-Y-Nant, Minera.

¹⁹ Wrexham County Borough Council (2008) Site Report. Site No. W215. New Brighton.

Site	Approximate distance and direction from centre point	Site description
		fairy flax (<i>Linum catharticum</i>), yellow rattle (<i>Rhinanthus minor</i>) and common milkwort (<i>Polygala vulgaris</i>) present.
The Smelt	564m South-East.	Site description ²⁰ : The Smelt is a complex area along the river Clywedog, with broad-leaved woodland, scrub, neutral grassland and some very small patches of calcareous grassland along the river banks. There is a species rich marshy grassland on a slope on the east side of the river. On either side of the marshy grassland there are patches dominated by bracken and bramble (<i>Rubus fruticosus</i>) with tall herbs and scattered gorse, birch (<i>Betula pendula</i>) and blackthorn (<i>Prunus spinosa</i>) scrub. The broad-leaved woodland on the steep south facing slope is dominated by sessile oak (<i>Quercus petraea</i>) and ash (<i>Fraxinus excelsior</i>), but sycamore is also abundant. The semi-improved grasslands are more species rich where the fields slope steeply down to the river.
Graig Fawr, Minera	745m South.	A Regionally Important Geological/geomorphological Sites (RIGS) site. NB: No information on this site is currently available from Wrexham CC.
Old Farm	779m North-West.	Site description ²¹ : A field adjacent to the Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC and Ruabon / Llantysilio Mountains and Minera SSSI. It is a semi-improved neutral grassland on a gentle west facing slope, next to a stream which is dominated by crested dog's-tail (<i>Cynosurus cristatus</i>). Ribwort plantain (<i>Plantago lanceolata</i>), black knapweed, white clover (<i>Trifolium repens</i>), selfheal (<i>Prunella vulgaris</i>) and sweet vernal grass (<i>Anthoxanthum odoratum</i>) are abundant. Burnet saxifrage (<i>Pimpinella saxifrage</i>) and cowslip (<i>Primula veris</i>) occur.

3.1.3 Ancient Woodlands

The data search from Cofnod highlighted that there are three ancient semi-natural woodland sites within a 1km search area, which are 263m south-east, 479m south-east, 839m south-west and a restored ancient woodland 954m north-east of the Application Site.

3.1.4 Flora and Fauna Records

A large volume of recent species records (post 2000) have been returned from Cofnod. These are summarised below. Where possible, distances and location have been approximated based on the centre point of the proposed works area. Species summarised below include European Protected Species (EPS), birds listed under Schedule 1 of the Wildlife and Countryside Act 1981, and species under Schedules 5, 8 and 9 of the WCA, and the Protection of Badgers Act 1992.

²⁰ Wrexham County Borough Council (2008) Site Report. Site No. W214. The Smelt.

²¹ Wrexham County Borough Council (2008) Site Report. Site No. W209. Old Farm.

3.1.4.1 European Protected Species

European protected species present within the 2km search area include the following historic (pre 2000) and recent (post 2000) records:

- There is a historic record of 23 common pipistrelle bats (*Pipistrellus pipistrellus*) 150m to the west of the proposed works, and another historic record 1km south-west of the site;
- There is a recent record of a confirmed brown long-eared bat (*Plecotus auritus*) and a lesser horseshoe bat (*Rhinolophus hipposideros*) roost 1km to the west of the site at Hoffman Kiln;
- There are recent records of whiskered/Brandt's bats (*Myotis mystacinus/brandtii* agg.), Natterer's bat (*Myotis nattereri*), *Myotis* sp., Daubenton's (*Myotis daubentonii*), whiskered bat (*Myotis mystacinus*) and brown long-eared bats (*Plecotus auritus*) 1km-1.5km west of the proposed works at Hoffman Kiln and Minera Quarry mine, and north at Nant-y-Ffrith; and,
- There is a historic record of great crested newt (*Triturus cristatus*) 786m SW near Pentre / Ruabon / Llanysilio Mountains.

3.1.4.2 UK Protected Species

UK protected species present within the 2km search area include:

- There are a number of recent records of Schedule 1 birds within the area including recent records for brambling (*Fringilla montifringilla*) and redwing (*Turdus iliacus*), the nearest being 572m to the north (though neither likely to be breeding locally);
- Recent records for fieldfare (*Turdus pilaris*), the nearest being 580m to the north of the site. There are also sensitive records for peregrine falcon, hen harrier and merlin;
- Two recent records for common crossbill (*Loxia curvirostra*), with the nearest 1.3km west of the site;
- There are three recent records of badger setts within the search area; 572m north-west, 583m south-west and 1.5km north of the proposed works;
- A grass snake (*Natrix natrix*) 583m south-west of the site and a historic record for a common frog (*Rana temporaria*);
- Two historic records of adder (*Vipera berus*) 840m north-west and 1.5km north of the proposed works;
- There is one historic record of common lizard (*Zootoca vivipara*) 840m north-west;
- A historic record of slow worm (*Anguis fragilis*) 840m north-west of the proposed works;

- A historic record for common toad (*Bufo bufo*) 1.5km to the north;
- There are records of Species of Principal Importance (Section 7 species) within the search area, including recent records for e.g. polecat (*Mustela putorius*), European hedgehog (*Erinaceus europaeus*), and a number of invertebrate species. Recent records of Section 7 bird species within the search area include:
 - lesser redpoll (*Acanthis cabaret*);
 - song thrush (*Turdus philomelos*);
 - black grouse (*Tetrao tetrix*);
 - black-headed gull (*Chroicocephalus ridibundus*);
 - house sparrow (*Passer domesticus*);
 - kestrel (*Falco tinnunculus*);
 - linnet (*Linaria cannabina*);
 - curlew (*Numenius arquata*);
 - dunnock (*Prunella modularis*);
 - bullfinch (*Pyrrhula pyrrhula*);
 - turtle dove (*Streptopelia turtur*);
 - starling (*Sturnus vulgaris*);
 - kestrel (*Falco tinnunculus*);
 - house sparrow (*Passer domesticus*);
 - yellowhammer (*Emberiza citrinella*);
 - marsh tit (*Poecile palustris*);
 - lapwing (*Vanellus vanellus*); and,
 - There is also a record of a spotted flycatcher (*Muscicapa striata*) within 500m of the site.
- There are numerous records of breeding birds within the search area. These records include recent breeding records for willow warbler (*Phylloscopus trochilus*), redstarts (*Phoenicurus phoenicurus*), long-tailed tit (*Aegithalos caudatus*) within 1km of the site.

3.1.4.3 Non-native invasive species

No records for invasive species were presented through the biodiversity records search.

3.2 Extended Phase 1 Habitat Survey

A total of seven habitats were identified within the proposed site and immediately surrounding area. These are shown in Figure 2 and described in the Sections below.

3.2.1 Semi-natural broadleaved woodland (A1.1)

The Application Site is located within a semi-natural broadleaved woodland at the top of a steep hill between residential buildings and adjacent to a main road to the north of the site. A public footpath runs along the western edge of the woodland, with a river to the south. The woodland is dominated by tree species such as sycamore (*Acer pseudoplanatus*), beech (*Fagus sylvatica*), hazel (*Corylus avellana*), holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and birch (*Betula pendula*).

The ground flora is diverse with lords and ladies (*Arum maculatum*), marsh marigold (*Caltha palustris*), ramsons (*Allium ursinum*), hart's tongue fern (*Asplenium scolopendrium*), bramble (*Rubus fruticosus agg.*), nettles (*Urtica dioica*), opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*), creeping buttercup (*Ranunculus repens*), snowdrops (*Galanthus nivalis*), wood anemone (*Anemone nemorosa*), daffodils (*Narcissus sp.*), cleavers (*Galium aparine*), dog rose (*Rosa canina*) and a large patch of Forsythia (*Forsythia sp.*) growing directly adjacent to the stream.

3.2.2 Dense / Continuous Scrub (A2.1)

On the edge of the woodland to the south east of the CSO, there is a large area of bramble, dog rose and dock (*Rumex obtusifolius*).

3.2.3 Tall ruderal (C3.1)

Adjacent to the existing CSO there is a stand of tall ruderal dominated by rosebay willowherb (*Chamerion angustifolium*) with bramble, umbellifers, dog rose, nettle and broad-leaved dock.

3.2.4 Running water (G2)

There is a small stream running from north to south through the woodland, which enters the Application Site through a culvert under the road and down into the river to the south of the site.

3.2.5 Introduced shrub (J1.4)

To the north-east of the site there is a large wide hedge consisting of cherry laurel which acts as a boundary between the woodland and a carpark.

3.2.6 Species rich hedgerow (J2.4)

Five important hedgerows were identified during the site surveys. This includes one important hedgerow along the road directly to the north and adjacent to the Application Site.

In the hedgerows to the north of the Application Site, species identified included the following species: ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), holly (*Ilex aquilifolium*), rose (*Rosa* species), willow (*Salix* species), sessile oak (*Quercus petraea*) and rowan (*Sorbus aucuparia*). The ground flora recorded included: common dog violet (*Viola riviniana*), hart's tongue fern (*Asplenium scolopendrium*) and wood anemone (*Anemone nemorosa*);

The important hedgerow which extends into the boundary of the proposed works area included ash, hawthorn, hazel and willow (*Salix* species). Ground flora recorded were herb Robert (*Geranium robertianum*), pignut (*Conopodium majus*), wood avens (*Geum urbanum*).

3.2.7 Tarmac (J6)

There is a road with pavements to the north of the woodland. There is a small carpark to the west of the Application Site.

3.3 Protected Species

The potential presence of protected species was assessed during the Extended Phase 1 Habitat survey and further protected species surveys. Details of the assessment are given in the following sub-sections.

3.3.1 Dormice

There is potentially suitable habitat within the woodland with species such as hazel and bramble which could provide a food source for dormice. However, there are no records of dormice within the search area.

3.3.2 Breeding birds

There is suitable habitat present for nesting birds within the broad-leaved woodland and scrub habitat in the survey area, in addition to along the hedgerows identified in the habitat survey.

3.3.3 Reptiles

There is habitat with potential to be utilised by reptiles within the Application Site, notably an area of grassland and scrub to the west Application Site, and a large area of bramble to the south-west of the CSO. Within the semi-natural broadleaved woodland there are dry areas of tall ruderal (i.e. tall herbs which colonize disturbed ground) including nettle (*Urtica dioica*) and rosebay willowherb (*Chamerion angustifolium*) with ants' nests and rabbit burrows, and

wet areas adjacent to the stream with marsh marigold (*Caltha palustris*) that could provide refuge and basking areas for grass snakes (*Natrix natrix*) and slow worms.

3.3.4 Amphibians

There is terrestrial habitat with potential to be utilised by amphibians within the survey area, such as the area within the woodland which has marsh marigold and the stream which could be utilised as refuge for common frog and common toad.

However, there were no ponds or standing water present within the survey area, and none were any identified within 500 metres of the site. As a result, newts are not considered further within this report.

3.3.5 Badger

There is habitat suitable for badgers within the woodland in which the current CSO is located and also to the north of the Application Site within the woodland, hedgerows and areas of dense scrub. Snuffle holes were recorded 20 metres southeast of the CSO on the 23rd March 2016.

During the subsequent survey on the 27th July 2016, badger trails and snuffle holes were recorded in the hedgerow either side of the track to the north of the site, approximately 45m away from the Application Site. Two badger setts were found to the south of the site which appeared active. The closest sett was 90m away and was recorded as a main sett with five entrance holes with fresh digging, bedding in the entrance of one hole, footprints and snuffle holes. The other sett which was 110m from the Application Site, had three entrances, one with fresh bedding in the entrance and recent footprints. This sett was assessed as an annex.

Badger snuffles were also found under a fallen tree adjacent to the stream approximately 70m to the south of the Application Site.

3.3.6 Bat - Bat Roost Assessment

There is habitat suitable for bats to utilise for foraging and for roosting within the woodland and hedgerows in the survey area, and within 30m of the Application Site. The findings of the ground level tree assessment are provided in Appendix F.

Within the 30 metres of the Application Site survey area eleven trees were assessed as having features with bat potential and subsequently inspected by a licenced bat ecologist. Six of these trees had high potential, four had medium potential and one had low potential.

3.3.7 Bats – Tree Climbing Assessment

A tree climbing assessment was undertaken by a licenced bat worker on the 21st October 2016 (see Appendix E). Seven trees within the 30 metres of the Application Site were assessed during this tree climbing assessment. No PRFs were found during the surveys, and no further survey works were recommended for bats prior to works commencing.

3.3.8 Otter

There is suitable habitat for otter along the stream which runs north to south via a culvert under the road and to the east of the Application Site. There is also suitable habitat along the River Clywedog which lies approximately 150m south of the proposed works. The semi-natural broadleaved woodland within the work area has suitability for otters for shelter and as a pathway for travelling along the stream. A potential laying up site was found approximately 100m downstream of the proposed works, but with no actual field signs present.

3.3.9 Water vole

The stream running north to south approximately 12 metres from the Application Site has low potential to be used by water voles as a resting place due to the rock bed and steep banks of the streams which would hinder burrowing.

4 Evaluation of Ecological Receptors

This section evaluates the nature conservation importance of the habitats and species present within the study area in terms of their importance in an international, national, county, local and less than local context as per the geographic scale identified in section 2.10. Table 4 below evaluates all the ecological resources present, or potentially present, within the study area.

Table 4 Evaluation of ecological features

Ecological feature	Evaluation	Conservation importance in context of development
Designated Site		
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC	International	The Berwyn and South Clwyd Mountains SAC is a large upland site (27,132 ha), the largest area of blanket bog and European dry heath in Wales. This site lies 480m West / South-West of the Application Site.
Berwyn SPA	International	Berwyn is the most important upland in Wales for breeding birds and supports a wide range of species. This site lies 767m West / South-West of the Application Site.
Ruabon/Llanysilio Mountains and Minera SSSI	National	Designated for moor, limestone and neutral grassland, upland breeding birds, plants and mines/caves containing bats. This site lies 330m South-West of the Application Site.
Wildlife Sites	County	There are five local wildlife sites within the 2km search area. Selected on County basis as best example of Habitats / Ecosystems.
Habitats		
Waterbodies	Local	Rivers and streams are LBAP priority habitats. The stream within the woodland adjacent to the works, and river to the south are a permanent feature of the site and surrounding area.
Semi-natural broadleaved woodland	Local	Broadleaved woodlands are a LBAP priority habitat. The site is within an area of broadleaved woodland; this is considered to be locally important and is of potential value to protected species.
Hedgerows	Local	Hedgerows are LBAP priority habitats, however only two short sections of species poor hedge were identified on site, with no connectivity.

Species		
Otter	Local	Suitable connective habitat exists within the stream and river providing potential foraging, commuting and habitat for shelter.
Bats	Local	No potential roost features were identified in the habitat within and adjacent to the application site. There are foraging and commuting opportunities present along linear features such as adjacent hedgerows and the woodland.
Birds	Local	Trees, scrub and marginal vegetation provide suitable breeding habitat for birds.
Reptiles	Local	Good potential for common reptile species (i.e. grass snake, common lizard and slow worm) within scrub, and tall ruderal vegetation areas.
Badger	Local	Two setts were found within the survey area, with the nearest being 90m from the proposed works. The woodland, scrub, hedgerows and tall ruderal habitat provide foraging and connectivity for badgers.
Amphibians	Local	Some potential for amphibians to be present.

5 Assessment of Effects

5.1 Construction Effects

In generic terms, the potential ecological impacts of the construction phase of the proposed works may be categorised as follows;

- Pollution;
- Permanent habitat loss;
- Disturbance during construction;
- Restrictions to species movement; and
- Species mortalities and injuries – e.g. through collisions with construction vehicles and direct contact through excavation works, falling and trapping in open excavations during construction.

5.1.1 Designated Sites

Pollution Risk

It is assumed that all proposed works will be carried out in accordance with relevant legislation and undertaken in compliance with the relevant Guidance for Pollution Prevention measures (GPPs) and industry best practice (e.g. Pollution Prevention Guidance on Pollution Prevention measures: works and maintenance in or near water: GPP5²², CIRIA²³ best practice). The contractor will have a Risk Assessment and Method Statement (RAMS) document containing site-specific methods to ensure that all site activities are controlled and are in accordance with the aforementioned best practice procedures. All plant will be sourced from a trusted reputable company and will come with spill kits which site personnel will be trained to use. No containers or fuel will be stored on site.

The Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains SAC lies 480m west – south-west, and extends 3.8km north-west. The existing CSO discharges into a stream which flows into the River Clywedog confluence downstream of the SAC. The works are localised and no pathway for effect has been identified. Therefore it is considered that there will **no effect** on this site.

The Berwyn SPA is 767m to the west of the proposed works. As the works are localised and no pathway for effect has been identified, it is considered that there will **no effect** on this site.

The Ruabon/Llanysilio Mountains and Minera SSSI lies 330m south-west of the proposed works. Designated for moor, limestone and neutral grassland, upland breeding birds, plants and mines/caves containing bats. The CSO discharges into

²² NRW, NIEA and SEPA (2017) Guidance for Pollution Prevention. Works and maintenance in or near water GPP5.

²³ <http://www.ciria.org>

a stream which flows into the River Clywedog; this confluence is downstream of the SSSI, thus it is considered that there will **no effect** on this site.

The Application Site also lies within the Pen y Nant Local Wildlife Site which features woodland, rank grassland and marshy ground. As pollution prevention measures will be in place during the course of the works, it is considered that there will be **no effect** on this site.

Habitat loss

The Application Site is within the Pen y Nant Local Wildlife Site where an area of vegetation covering 61m² will be cleared or pruned to allow for the construction of the new improved vehicular access track. The main features of this site are the woodland, rank grassland and marshy areas of ground flora. A small area of young trees will be cleared and pruning of the hedgerow to allow for the improved access track which will cover an area of 30m², however there is existing disturbance to the flora present at this location as the access point is already in use. An area of tall ruderal 31m² will also be cleared. Vegetation clearance will be kept to a minimum, and regrowth of vegetation allowed on completion of the work where space is available. Therefore it is considered that there will be **an insignificant effect** on the site.

5.1.2 Important Hedgerows

Habitat Loss

The existing gateway to access the CSO is located within an 'important' hedgerow, classified under the criteria outlined within the Hedgerow Regulations. Vegetation clearance will be required in order to allow the construction of the new access track and kiosk. In the absence of mitigation, there is potential for a **negative effect** at a *local scale*.

The area that is to be cleared is a relatively small area and involves pruning of the edges of an existing gateway and access route which will be an area of approximately 30m² (as illustrated in the AIA, Appendix D). On completion of the works, replacement planting with suitable locally native species will be undertaken where possible. As the loss of habitat will be small scale and involve widening of an existing gap in the hedgerow, it is considered that there will be **an insignificant effect** on the integrity of the hedgerow.

5.1.3 Reptiles

Pollution Risk

In the absence of any mitigation measures runoff from any exposed ground and excavation of earth have potential to create pollution incidents affecting the water-body and semi-natural grassland habitats on site, and subsequently any amphibians and reptiles present resulting in a **significant negative effect**.

The implementation of the pollution prevention mitigation outlined above (Section 5.1.1) with regard to use of relevant guidance with regard to pollution

prevention measures for designated sites, it is considered sufficient to conclude there will be **no effect** on reptiles.

Habitat Loss

There is an area of scrub which will be cleared to allow for the construction of the new kiosk and access track. In the absence of mitigation, there is potential for a negative effect at a local scale though the scale of loss is unlikely to be significant on the local reptile population.

A pre-construction check for reptiles by a suitably qualified ecologist will be carried out immediately prior to works commencing. Vegetation clearance is to be kept to a minimum and subject to a two stage cut in areas identified as having good potential for reptiles i.e. within the area of tall ruderal and dense scrub. Tree trunks and large branches will be retained and replaced within the area on completion of the works, to provide potential refuge for reptiles.

With the implementation of this mitigation, it is considered that habitat removal will have no **effect** on reptiles.

Species Mortalities and Injuries

As described above, there is some suitable habitat present for common species of reptile within the tall ruderal habitat within the Application Site. In the absence of mitigation, there is potential for species mortality and injury to occur. Therefore, in the absence of mitigation there is potential for the works to have a **significant negative effect** on reptiles potentially present at a *local scale*.

As construction activity is proposed to take place when reptiles are likely to be active (May to August), any works that may be carried out within suitable reptile habitat will be subject to pre-construction checks by a suitably qualified ecologist. Reptile fencing will be installed around the periphery of the working area to prevent reptiles entering the works area, to avoid mortalities and injuries during the course of the works.

With the inclusion of ecological supervision of any construction works within the vicinity of potential reptile habitat, and the presence of connective alternative habitat for reptiles on site, no effect from species mortality or injury should occur to local reptile populations.

5.1.4 Bats

Habitat Loss

There is potential habitat within the woodland, scrub and hedgerows for bats to utilise for commuting and foraging. There is some vegetation clearance proposed to allow access to the site and for the proposed works which will result in the loss of a small area of foraging habitat. As above, vegetation clearance is to be kept to a minimum. With the implementation of this mitigation, it is considered that habitat removal will have an **insignificant negative effect** on bats at a *local scale*.

Disturbance

No trees within the direct vicinity of the works have bat roost potential. Lighting from construction will be aimed away from hedgerows or trees so as to avoid any impact upon any foraging bats. With the implementation of this mitigation, it is considered that habitat removal will have **no significant negative effect** on bats at a *local scale*.

5.1.5 Badger

Habitat Loss

There is potential habitat within the woodland, scrub, grassland and hedgerows for badgers to utilise for building setts, commuting and foraging. There is some vegetation clearance proposed to allow access to the site and for the proposed works which will result in the loss of a small area of suitable habitat. As above, vegetation clearance is to be kept to a minimum. With the implementation of this mitigation, it is considered that habitat removal will have an **insignificant negative effect** on badgers at a *local scale*.

Disturbance

Badgers have been identified to be present within the broadleaved woodland and hedgerows in the vicinity of the Application Site. In addition to the potential for badgers to establish setts within the vegetation and earth banks on site, there is also the potential for the habitat to provide commuting and foraging opportunities.

Due to the presence of the badger sett within the woodland to the south of the proposed works, a pre-construction check for badger setts by a suitably qualified ecologist is required. If an active badger sett is found, a species licence may be required if the construction activities could disturb or damage the sett. The associated method statement would detail appropriate mitigation measures, such as construction methods and sett exclusion techniques (if required). The closest badger sett identified on site is 90 metres away from the Application Site, therefore **no effect** on badgers is anticipated.

Physical Restrictions to Species Movement

There is suitable habitat for badgers within the woodland and the Application Site for foraging, building setts and commuting. Badger field signs were found approximately 20 metres away from the Application Site to the South-East and 45 metres to the north of the site in hedgerows. It is considered unlikely that badgers will be travelling through the site during daylight hours; therefore night-time working has the potential to restrict badger movement through the site, which is likely to have a **negative effect** on a feature of less than *local scale*.

This effect is unlikely to be significant on the local population of badgers; nonetheless, with the inclusion of a restriction on working during daylight hours, it is concluded that there will be **no effect** on badgers from physical restrictions to movement.

Species Mortalities and Injuries

There is high potential for badgers to travel through the site at night, therefore a potential pathway exists for individuals to become trapped within any excavations associated with the improvement works, resulting in mortalities and/or injuries. In the absence of any mitigation, there is likely to be a **significant negative effect** on badgers; in addition such effects may cause legal infringement.

Any excavations should be covered over at night or a suitable means of escape (i.e. a ramp) for mammals provided. With the inclusion of the mitigation outlined, it is concluded that there will be **no effect** on badgers from this potential impact.

5.1.6 Breeding birds

Habitat Loss

If vegetation clearance is required as part of the scheme in the breeding bird season (March-August inclusive) in the absence of mitigation, there is potential for a **significant negative effect** on nesting birds at a *local scale*.

Vegetation clearance is to be kept to a minimum, and a pre-construction check for nesting birds by a suitably qualified ecologist will be carried out immediately prior to the vegetation clearance during the nesting bird period (March to August inclusive). With implementation of the above mitigation it is considered that the habitat removal will not have a **no effect** on nesting birds.

Disturbance & Species Mortality/Injury

There is potential for nesting birds to be present within the trees, scrub, hedgerow and tall ruderal vegetation during the period of March-August (inclusive).

A pre-construction check of vegetation suitable for nesting birds in the vicinity of the works by a suitably qualified ecologist is recommended in order to avoid potential effects. If nesting birds are found during the pre-construction checks, further work within the immediate and surrounding area will be delayed until young have fledged and left the nest, and the nest is no longer in use.

With the inclusion of ecological supervision during works potentially affecting birds during the nesting season, it is considered that there will be **no significant negative effect**.

5.1.7 Otter

Pollution Risk

There is potentially suitable connective and foraging habitat within the site to support otter, within the semi-natural broadleaved woodland, scrub and stream which in the vicinity of the proposed works.

In the absence of any mitigation measures runoff from any exposed ground and excavation of earth have potential to create pollution incidents affecting otter, resulting in a **significant negative effect** at a *local scale*.

The implementation of the pollution prevention mitigation outlined above (Section 5.1.1) with regard to use of relevant guidance with regard to pollution prevention measures for designated sites, it is considered sufficient to conclude there will be **no effect** on otter.

Disturbance

There is suitable habitat present within the site to potentially support otter, within the woodland, streamside habitat and river habitat to the south of the proposed works.

The site is likely to provide commuting and foraging opportunities for otter; a resting place was observed on the edge of the stream under a tree during the survey. Otter are largely nocturnal and are most likely to be active outside construction hours and the construction hours will be restricted to daylight hours.

A pre-construction otter survey will be carried out prior to the commencement of the works within the area of the proposed pipe crossings by an appropriately qualified ecologist, in order to confirm the presence/likely absence of otter. If otter are found to be present within the area of the proposed works, consultation with NRW with regards to the need for an otter licence.

As such, it is considered that construction based disturbance is likely to **no significant effect** on otter.

Physical Restrictions to Species Movement

The construction works adjacent to the stream within the woodland are proposed to be temporary, and are to last approximately twelve weeks. In consideration of the potential for otter to travel through the site at night, limitations on works will be imposed after daylight hours.

Consequently, with the inclusion of mitigation regarding timing of works during daylight hours, it can be concluded that the proposed works would have **no effect** on otter movement.

Species Mortalities and Injuries

Any deep excavations will either be covered overnight (or when unattended), or a ramp will be placed within the excavation to allow any trapped animals to escape.

As above, there is potential for otter to travel through the site at night, and a potential pathway exists for mortalities and/or injuries to occur; with the inclusion of the mitigation outlined above for badger, there is likely to be **no effect** on otter.

5.1.8 Water vole

Pollution Risk

The stream within the woodland has low habitat suitability for water voles due to steep rocky banks and shallow water. In the absence of any mitigation measures runoff from any exposed ground and excavation of earth have potential to create pollution incidents affecting water vole, resulting in a **significant negative effect** at a *local scale*.

The implementation of the pollution prevention mitigation outlined above (Section 5.1.1) with regard to use of relevant guidance with regard to pollution prevention measures for designated sites, it is considered sufficient to conclude there will be **no effect** on water vole.

Disturbance

There is habitat present along the streamside habitat and river habitat to the south of the Application Site with low potential to support water vole. As such, it is considered that construction based disturbance is likely to have **no effect** on water vole due to the low potential habitat on site.

Physical Restrictions to Species Movement

The construction works adjacent to the stream within the woodland are proposed to be temporary, and are to last approximately twelve weeks. There will be limitations on works imposed after daylight hours.

Consequently, with the inclusion of mitigation regarding timing of works during daylight hours, it can be concluded that the proposed works would have **no effect** on water vole movement.

Species Mortalities and Injuries

There are no recent records for water voles within the local area. Due to the rocky nature of the stream banks there is a low potential for water voles to use the stream for burrowing, but potential for water voles to use the stream for commuting. Any deep excavations will either be covered overnight (or when unattended), or a ramp will be placed within the excavation to allow any trapped animals to escape.

As above, there is some potential for water vole to travel through the site, and a potential pathway exists for mortalities and/or injuries to occur; with the inclusion of the mitigation outlined above for badger, there is likely to be **no effect** on water vole.

6 Summary of mitigation and enhancement

The mitigation and enhancement for habitats and species is detailed below. For the purposes of this Ecological Appraisal, prevention or reduction of significant environmental effects is termed mitigation and any work which would improve the site or parts of the site is termed enhancement.

6.1 Designated sites

Pollution prevention measures will be outlined within the Construction Environmental Management Plan (CEMP) to ensure no pollution or sedimentation event will occur that could have the potential to effect designated sites, including the Pen y Nant Local Wildlife Site which the Application Site is within and also the connected aquatic habitats.

6.2 Protected Species

6.2.1 Mitigation

In light of the potential significant effects identified in Section 5, the following recommendations for mitigation are made to ensure compliance with current legislation and to protect existing habitats and species:

- Toolbox talks with contractors and site team regarding protected and notable species prior to the commencement of the works.
- A pre-construction check for badgers should be undertaken by a suitable qualified ecologist prior to works commencing.
- A pre-construction check should be carried out along the stream and river banks, and within areas identified as having potential for use by otters to confirm the likely absence of a holt or laying up site within 30m of the proposed works.
- If works are to be carried out within the bird nesting season (March-August inclusive) then potentially suitable refuge habitat should be checked by a suitably qualified ecologist immediately prior to its removal/to the commencement of works. If nests are found, further work will need to be delayed until young have fledged and left the nest, and the nest is no longer in use.
- If works are to be carried out within the period reptiles and amphibians are likely to be active (March to October inclusive), then potentially suitable refuge habitat should be checked by a suitably qualified ecologist immediately prior to its removal. If any reptiles/amphibians are found, they are to be moved to a suitable alternative habitat, where they will not be disturbed.
- Mitigation measures to avoid impacts to foraging activity will be implemented; no works are to be carried out outside daylight hours.

- No working is to continue after daylight hours to avoid negative effects to wildlife, including badgers, bats and otters.
- If any protected species are encountered during the works, all work is to stop immediately and a suitably qualified ecologist contacted as soon as possible.
- Any open excavations on site are to be covered/protected at night or an appropriate escape for mammals provided.
- Pollution prevention measures are to be included within the contractor Risk Assessment and Method Statement (RAMS) document in order to protect the designated sites and protected species within the vicinity of the works.

6.2.2 Enhancement

On completion of the works the entrance to the site will be replanted with suitable native hedgerow species where space allows.

On completion of the works habitat piles will be created out of tree trunks and large branches which have previously been removed from the area of works. This will allow a place for reptiles to use as refuge.

6.3 Woodland, trees and hedgerows

As detailed in the tree survey report and arboricultural impact assessment (see Appendix C and D for full reports), all trees to be retained should be protected by fencing in accordance with the detail in BS5837:2012. Some limited ground protection measures may be required on the fringes of the proposed access road. The implementation of the tree protection on site should be in compliance with a site specific Tree Protection Plan (TPP) and Arboricultural Method Statement (AMS).

7 Residual Effects

Subject to implementation of the mitigation measures and enhancement proposals discussed above, the proposed development is capable of being accommodated without significant negative impacts on ecologically sensitive features within the survey area.

Appendix A

Legislative Context

A1 Legislative Context

Legislative Context

A framework of international and national legislation exists to protect and conserve wildlife and habitats. This is described in the following sections.

Statutory Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation (Natural Resources Wales).

The protection afforded to SSSIs is used to underpin the designation of areas at a European Level. European Sites comprise:

- Special Areas of Conservation (SAC) designated under the Conservation of Habitats and Species Regulations 2010 (as amended) (known as the Habitats Regulations);
- Special Protection Areas (SPA) designated under the Wildlife and Countryside Act.

Wetlands of International Importance (Ramsar Sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are normally also notified as SSSIs but are only considered European Sites as a matter of UK and Local Government Policy.

The Habitats Regulations transpose the requirements of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into law within England and Wales, while the Wildlife and Countryside Act transposes Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) into the law within England and Wales. Equivalent legislation exists to transpose these directives in the law within Scotland and Northern Ireland.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European Sites are considered. Specifically Regulation 61(1) states:

“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –

(a) is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.”.

The formal consideration of effects on European Sites is therefore undertaken by the determining authority such as the Local Planning Authority.

Local Nature Reserves can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949 (as amended). However this protection is usually conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as Sites of Importance for Nature Conservation.

European Protected Species

The Habitats Regulations convey special protection to a number of species of fauna which are listed in Schedule 2 of the Regulations and are referred to as European Protected Species (EPS):

- All UK resident bat species;
- Common otter (*Lutra lutra*);
- Wild cat (*Felis silvestris*);
- Common dormouse (*Muscardinus avellanarius*);
- All whale and dolphin species;
- Pool frog (*Rana lessonae*);
- Natterjack toad (*Bufo calamita*);
- Great crested newt (*Triturus cristatus*);
- Smooth snake (*Coronella austriaca*);
- Sand lizard (*Lacerta agilis*);
- All marine turtles.
- Sturgeon (*Acipenser sturio*);
- Large blue butterfly (*Maculinea arion*);
- Fisher's estuarine moth (*Gortyna borelii lunata*); and
- Lesser whirlpool ram's-horn snail (*Anisus vorticulus*).

Regulation 41 makes it an offence to:

- Deliberately capture, injure or kill any wild animal of a EPS;
- Deliberately disturb wild animals of such a species;
- Deliberately takes or destroys the eggs of such a species;
- Damages or destroys a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution of the species.

Licences can be granted by the relevant SNCO for developments (sometime referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.

UK Protected Species

The Wildlife and Countryside Act 1981 provide protect to both EPSs and other species including (but not limited to) wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

Water vole receive protection under the Wildlife and Countryside Act 1981 which prohibits the killing, injuring or taking by any method.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

Badger and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

Other Legislation Relating to Species

The Environment (Wales) Act 2016 includes a duty on all public authorities to have regard to the conservation of biodiversity in the exercise of their functions. This duty applies to government bodies, local authorities and statutory undertakers. The Act also requires lists to be published of Habitats and Species considered to be of Principal Importance for the Conservation of Biological Diversity. These are referred as Section 7 habitats and species after the sections of the Act which require the publication of lists in each devolved area.

Hedgerow Regulations 1997

The Hedgerow Regulations 1997 set out a framework for the protection of hedgerows against removal where they are deemed to be important either due to their age, ecological or archaeological features. Approval is required from the local authority prior to the removal of Important Hedgerows.

Appendix B

Target Notes

Target Note	Habitat	Description
TN1	Semi-natural broadleaved woodland	Badger snuffle holes. Rabbit droppings and hole close by too.
TN2	Semi-natural broadleaved woodland	Badger sett
TN3	Semi-natural broadleaved woodland	Resting place under tree for large mammal, possibly otter or badger. Badger snuffle holes close by (1.5metres from resting place).
TN4	Species-rich intact hedgerow	Badger trail through vegetation, and snuffles.
TN5	Species-rich intact hedgerow	Badger trail through vegetation, and snuffles.
TN6	Species-poor intact hedgerow	Cherry laurel hedge along boundary to carpark.

Appendix C

Tree Survey report



Tree Survey

At

**Land off Church Road
Minera, Wrexham**

*Inspected by:-
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17th October, 2016

**Registered Office: Treescene Limited
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I have been instructed by Angharad Owen of Arup to carry out a survey on trees at Land off Church Road, Minera, Wrexham.

Scope of Report

This Tree Survey has been undertaken within the recommendations of British Standards 5837:2012 and current good arboricultural practice.

The survey entailed a visual inspection from ground level of all trees.

Each tree has been numbered and, where instructed, for future identification on site, have been tagged using small durable metal or plastic tags.

Due to variations of existing ground levels through the site, height dimensions are estimated and are given in metres. Accurate heights, measured with the aid of optical instruments can be provided where instructed.

Trunk/stem diameters are measured at 1.5 metres above ground level, or immediately above the root flare for multi-stemmed trees.

Estimate branch spread is taken in metres from the centre of the trunk, at the four cardinal points of a compass, to achieve an accurate representation of crown shape.

An assessment of a tree's age classification is made in terms of its maturity within the site's landscape.

An assessment of a tree's physiological condition is to be made as good, fair, poor, dead.

Data on the structural condition of the tree should be entered, e.g., collapsing, leaning and the presence of any decay or physical defect should be noted.

Preliminary management recommendations include further investigation of suspected defects that require more detailed assessment and potential for wildlife habitat.

An assessment of a tree's future life expectancy is made as <10, 10-20, 20-40 or >40 etc.

Table 1 – Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)		
<u>Category U</u> Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7		
	1 Mainly Arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation
<u>Category A</u> Those of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as Arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation; historical, commemorative or other value (e.g. veteran trees or wood-pasture)
<u>Category B</u> Those of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural benefits
<u>Category C</u> Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

Tree No.	Species	Height(m)	Single/Multi Stemmed	Stem Diameter(m)	Branch Spread(m)				Height of Crown(m)	Age	Physiological Condition	Structural Condition	Prel. Man. Recommendations	Est. Remaining Contribution	Category
					N	E	S	W							
T1	Monterey Cypress (Cupressus macrocarpa)	8	Single	0.46	8	1	8	3	3	Mature	Fair to poor	Tree of variable form that has been heavily reduced at around 8m truncating the main stem at this point. Some thinning and die-back of crown.	Prune to remove major deadwood. Monitor for health.	10-20	C
T2	Monterey Cypress (Cupressus macrocarpa)	19	Single	0.77	8	3	9	4	2	Mature	Fair	Notable specimen of reasonable form	No action required at this time	>40	B
T3	Monterey Cypress (Cupressus macrocarpa)	18	Single	0.69	9	3	8	3	2	Mature	Fair to poor	Tree of variable form with extensive thinning throughout crown. This specimen is partially suppressed by adjacent trees.	Prune to remove major deadwood. Monitor for health.	10-20	C
T4	Monterey Cypress (Cupressus macrocarpa)	19	Single	0.88	8	8	7	3	4	Mature	Poor	Notable specimen of reasonable form with extensive die-back throughout crown. There is virtually no live foliage remaining on this specimen which is clearly in a moribund condition.	Remove	<10	U
T5	Hawthorn (Crataegus monogyna)	4	Multi	0.1	2	1	0	2	1	Young	Fair	Scrubby specimen of variable form	No action required at this time	>40	C

Tree No.	Species	Height(m)	Single/Multi Stemmed	Stem Diameter(m)	Branch Spread(m)				Height of Crown(m)	Age	Physiological Condition	Structural Condition	Prel. Man. Recommendations	Est. Remaining Contribution	Category
					N	E	S	W							
T6	Hawthorn (Crataegus monogyna)	5	Single	0.1	2	1	0	0	1	Young	Fair to poor	Young specimen of variable form	No action required at this time	20-40	C
T7	Hazel (Corylus avellana)	5	Multi	0.2	2	2	2	2	2	Young	Fair to poor	Multi stemmed specimen of variable form	No action required at this time	20-40	C
T8	Ash (Fraxinus excelsior)	8	Single	0.1	2	2	2	2	4	Young	Fair	Young specimen of reasonable form	No action required at this time	>40	C
T9	Hazel (Corylus avellana)	4	Multi	0.2	2	1	1	2	1	Young	Fair to poor	Multi stemmed specimen of variable form	No action required at this time	20-40	C
T10	Hazel (Corylus avellana)	4	Multi	0.15	2	1	1	2	2	Young	Fair to poor	Multi stemmed specimen of variable form	No action required at this time	20-40	C
T11	Hazel (Corylus avellana)	4	Multi	0.1	2	2	1	0	2	Young	Fair to poor	Twin stemmed specimen of variable form	No action required at this time	20-40	C
T12	Hazel (Corylus avellana)	5	Multi	0.25	3	3	3	1	1	Young	Fair to poor	Multi stemmed specimen of variable form	No action required at this time	20-40	C
T13	Hazel (Corylus avellana)	5	Multi	0.15	3	3	1	1	2	Young	Fair to poor	Multi stemmed specimen of variable form	No action required at this time	20-40	C

Tree No.	Species	Height(m)	Single/Multi Stemmed	Stem Diameter(m)	Branch Spread(m)				Height of Crown(m)	Age	Physiological Condition	Structural Condition	Prel. Man. Recommendations	Est. Remaining Contribution	Category
					N	E	S	W							
T14	Hazel (Corylus avellana)	4	Multi	0.2	1	2	2	1	1	Young	Fair to poor	Multi stemmed specimen of variable form with evidence of slight lifting of root-plate	Monitor for stability	10-20	C
G15	Group of Hazel (Corylus avellana) and Hawthorn (Crataegus monogyna)	5	Single and multi	0.15	2	2	2	2	1	Young	Fair to poor	Dense thicket containing young mainly multi stemmed scrubby specimens	No action required at this time	20-40	C
G16	Group of Cherry Laurel (Prunus laurocerasus)	6	Multi	0.3	5	5	5	3	0	Middle aged	Fair to poor	Multi stemmed specimens forming dense scrubby thickets	No action required at this time	20-40	C
T17	Scots Pine (Pinus sylvestris)	9	Single	0.15	2	2	2	2	2	Young	Fair	Young specimen of good form with upright crown	No action required at this time	>40	C
T18	Ash (Fraxinus excelsior)	11	Single	0.18	4	4	4	4	2	Young	Fair	Tree of reasonable form. Notable branch extends to the west at 2m.	Monitor for safety	>40	C

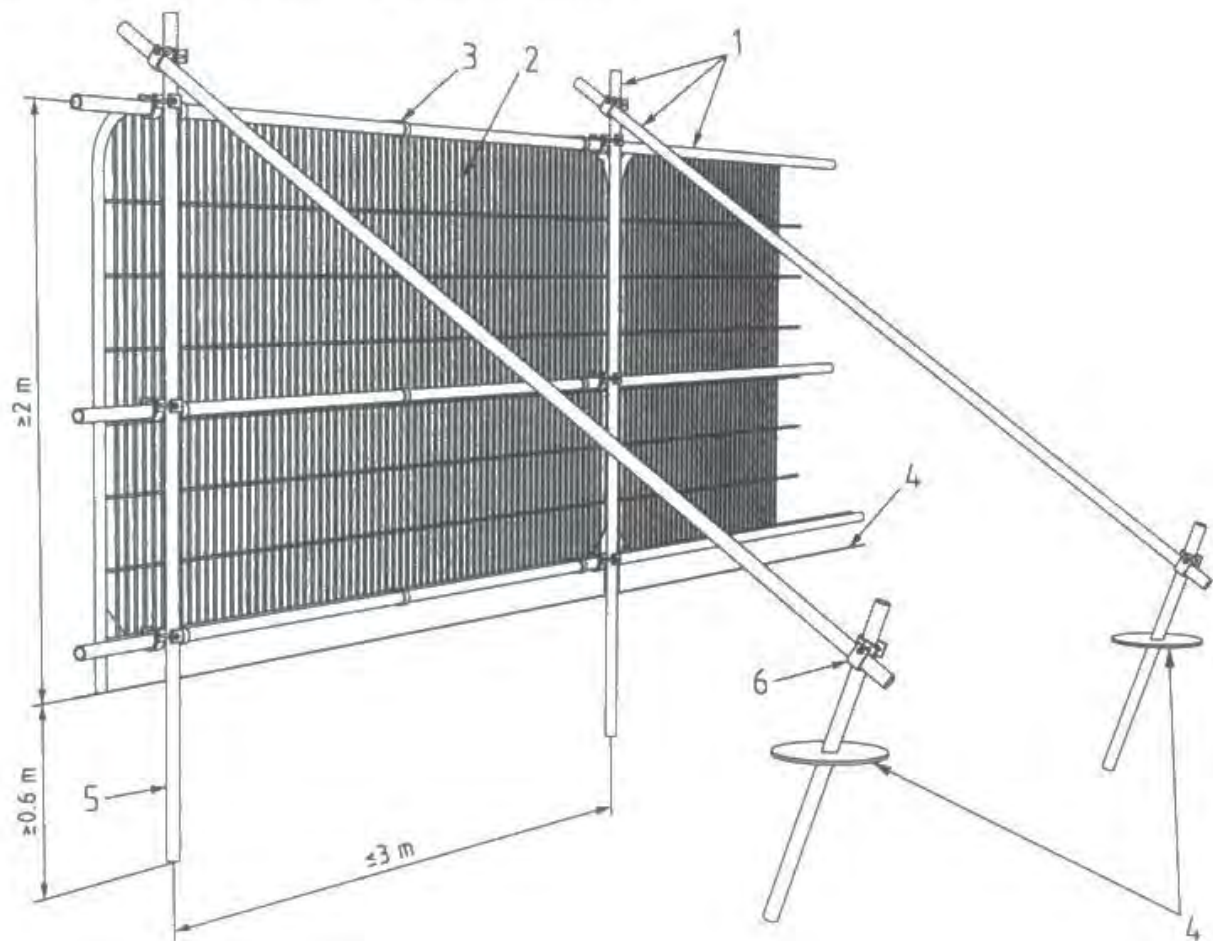
Tree No.	Species	Height(m)	Single/Multi Stemmed	Stem Diameter(m)	Branch Spread(m)				Height of Crown(m)	Age	Physiological Condition	Structural Condition	Prel. Man. Recommendations	Est. Remaining Contribution	Category
					N	E	S	W							
T19	Ash (Fraxinus excelsior)	11	Multi	0.45	4	5	4	5	2	Middle aged	Fair to poor	Twin stemmed specimen of variable form with notably included fork at base of main stem. Evidence that this specimen had previously been reduced at approximately 1.5m leading to multi stemmed re-growth potentially weakly joined to main stem.	Undertake 20% overall crown reduction. Crown raise to 6m over highway. Monitor for safety.	10-20	C
G20	Group of Hawthorn (Crataegus monogyna), Hazel (Corylus avellana) and Ash (Fraxinus excelsior)	6	Multi	0.1	2	2	2	2	1	Young	Fair to poor	Scrubby specimens forming small copse	No action required at this time	20-40	C
G21	Group of Hawthorn (Crataegus monogyna) and Hazel (Corylus avellana)	5	Single and multi	0.1	2	2	2	2	1	Young	Fair to poor	Young specimens established as hedgerow lacking in dense lower branch growth	No action required at this time	20-40	C

Tree No.	Species	Height(m)	Single/Multi Stemmed	Stem Diameter(m)	Branch Spread(m)				Height of Crown(m)	Age	Physiological Condition	Structural Condition	Prel. Man. Recommendations	Est. Remaining Contribution	Category
					N	E	S	W							
T22	Ash (Fraxinus excelsior)	11	Multi	0.35	2	1	3	6	3	Middle aged	Fair to poor	Twin stemmed specimen of variable form. Main stem and mid crown heavily colonised by ivy thus preventing full inspection. This specimen leans slightly to the west.	Sever ivy at base. Monitor for stability.	10-20	C
T23	Ash (Fraxinus excelsior)	8	Single	0.26	0	0	0	6	3	Middle aged	Poor	Tree of poor form established on steep stream-side bank. This specimen leans excessively to the west and will become unstable at a later date.	Remove	<10	U

Recommendations for Tree Protection during Development

Due to the high risk to established trees we would recommend the installation of protective fencing prior to commencement of **any** works on site in accordance with BS 5837:2012 “Trees in relation to Construction”. Trees should be protected using scaffold frame supporting weld mesh panel fencing sited on the edge of the Root Protection Area as defined in BS5837:2012. These fenced areas should not be used for the storage of any plant machinery or materials and personnel should be excluded at all times; these fences should remain in situ until after final landscaping has been carried out, removed by hand with great care to prevent compaction or root damage to established trees. The services of a suitably qualified arborist should be sought **prior** to the commencement of each stage.

Figure 2 Default specification for protective barrier



Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

Appendix D

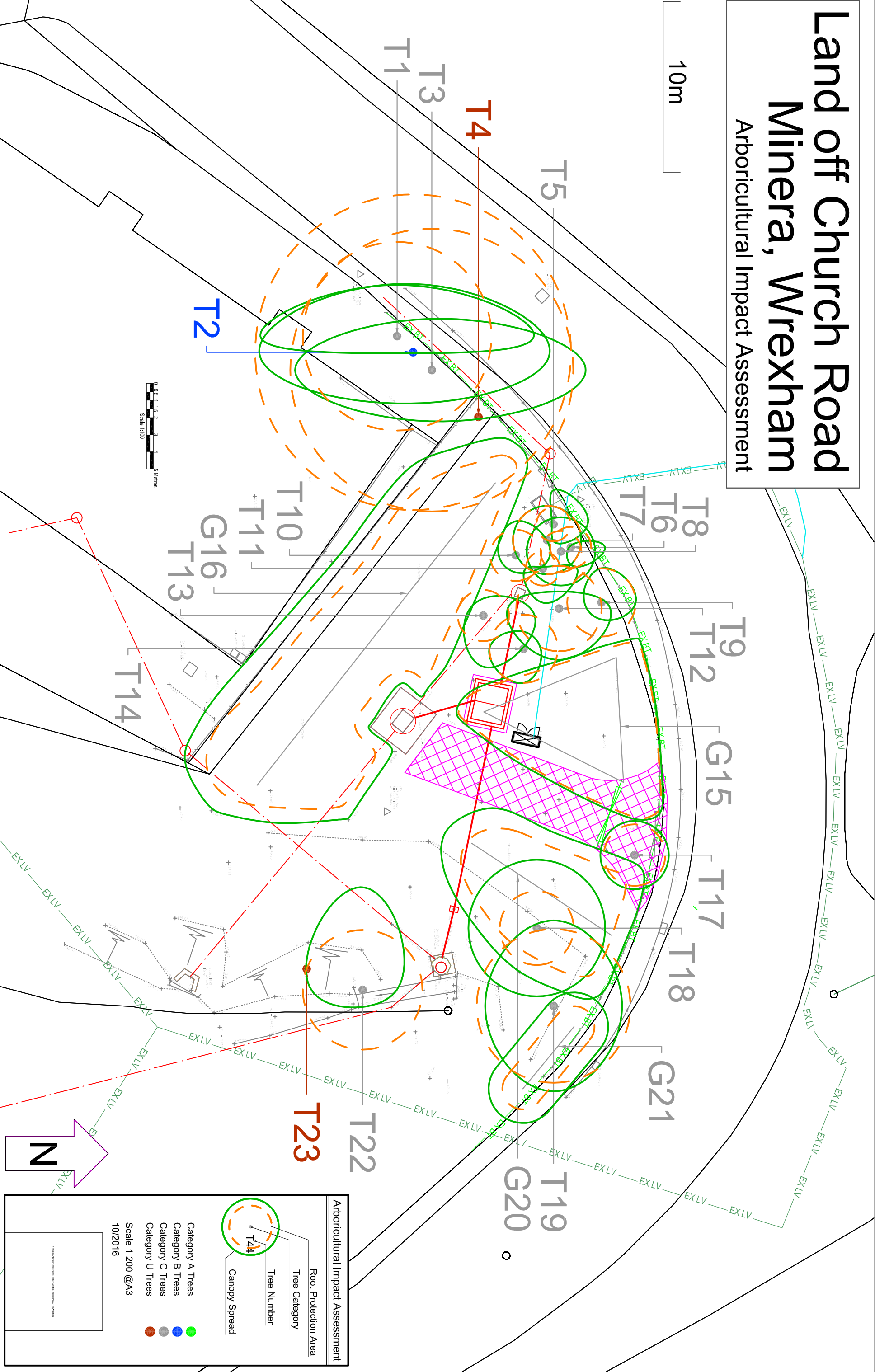
Arboricultural Impact Assessment

Land off Church Road Minera, Wrexham

Arboricultural Impact Assessment

10m

0 0.5 1 1.5 2 3 4 5 Metres
Scale 1:100



Appendix E

Bat Survey File Note

Minera, Coed Porth tree survey - surveyed 21st October 2016

Tree 1

Approximate grid ref SJ 26804 52009.

Young 2 stemmed ash. The larger stem is covered with ivy from approximately 4m in height to the top of the tree. The ivy is small and not able to provide roosting opportunities for bats. . No nests or potential roost features (PRF) found during the survey.

No further surveys needed.



Tree 1 in the foreground.



Tree 2

Approximate grid ref SJ 26803 52008.

Young ash on the bankside. Some small ivy coverage on main trunk approximately 4m high, but it is small ivy and unlikely to provide roosting opportunities. The main trunk leans out to the west. There is a dead limb from the base of the tree but it is small and with no visible cavities suitable for bats. No nests or PRF found during the survey.

No further surveys needed.



Main truck of tree

Dead branch



Main trunk of tree



Tree 3

Approximate grid ref SJ 26811 52016.

A young coppiced ash tree on roadside by fence line. There are 2 main trunks from the base at approximately 1m from the ground. There is a small inclusion at the point the two meet, but it doesn't have a cavity at the moment. Above this the tree becomes multi stemmed. There is a small wound hole on the east side of the tree but it is only big enough for slugs at the moment. No nests or PRF found during the survey.

No further surveys needed.



Inclusion point



Tree 3

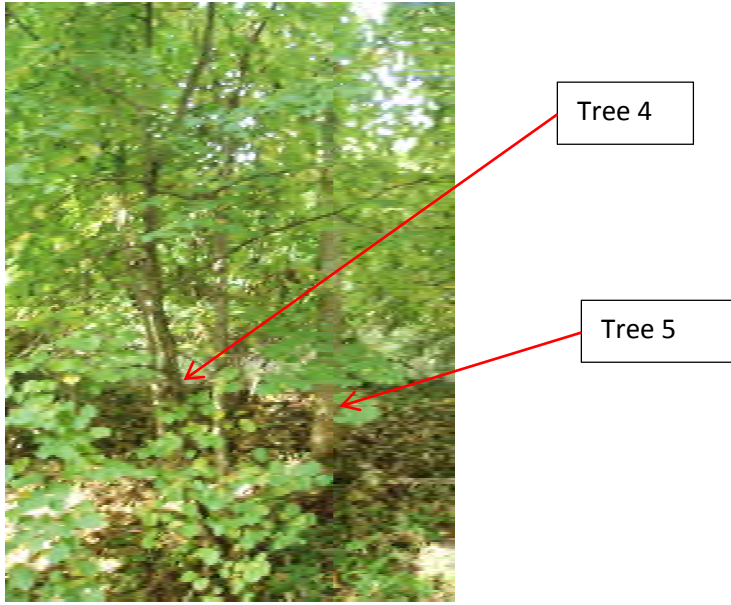
Trees 4, 5, 6 and 7 are in a group together.

Tree 4

Approximate grid ref SJ 26805 52017.

A small 3 stemmed hazel, approximately 8m in height. No nests or PRF found during the survey.

No further surveys needed.



Tree 5

Approximate grid ref SJ 26803 52016.

A small ash, forks into 2 stems at approximately 2m above ground level. No nests or PRF found during the survey.

No further surveys needed.



Tree 6

Approximate grid ref SJ 26802 52013.

A small single trunk ash, approximately 8m high. No nests or PRF found during the survey.

No further surveys needed.



Tree 6

Tree 7

Approximate grid ref SJ 26797 52013.

A small multi stemmed hazel, approximately 8m high. No nests or PRF found during the survey.

No further surveys needed.

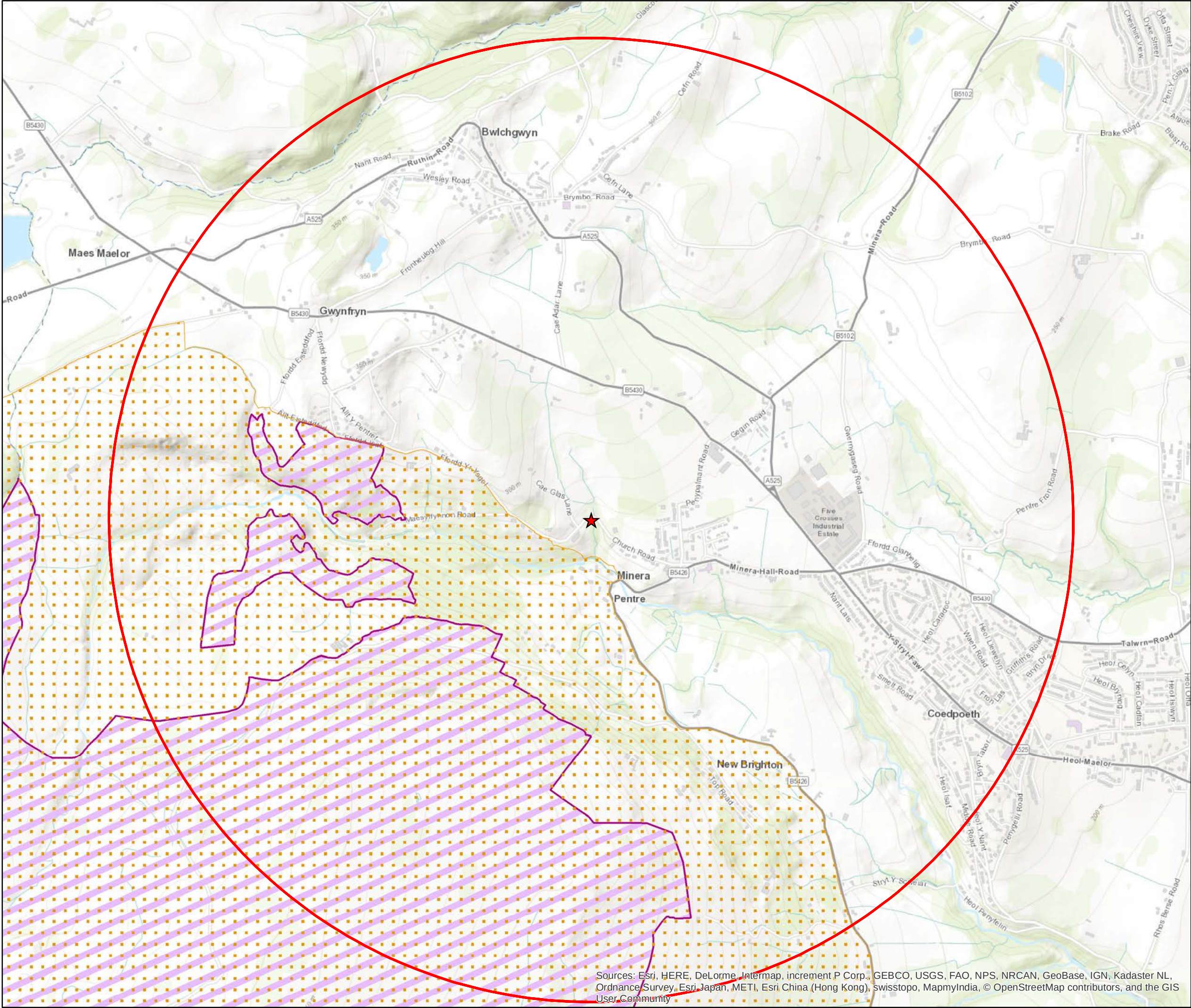


Tree 7

[illegible]

No PRF or birds nest were found during the surveys. If the work is to be undertaken after the bird breeding season has started, it is recommended that the trees are rechecked for bird nests.

It is not known if there are dormice in the area, but no nests were found and all hazel nuts checked had not been eaten by dormice. It is recommended that a desk survey identifies if dormice are found in the area prior to works starting.



Legend

★

Location of Application Site

2km Buffer

Area of Outstanding Natural Beauty (AONB)

Special Areas of Conservation (SAC)

PO	2017-06-27	LL	Preliminary	LL	LL	25/05/2017
Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
Capital Delivery Alliance Cynghrair Cyflawni Cyfalaf Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ						
Project Name.			Minera CSO			
Drawing Title.			Figure 1 Location of proposed works and protected sites			
Drawing Status.			Preliminary			
Originator		LL	Designer		LL	Date.
						08/06/2017
Scale.			Internal Project Number		241138	Rev.
						P0
Drawing Number.			001			

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Legend

Boundary of proposed access track

Target Notes

Species-rich intact hedge

Species-poor intact hedge

Semi-natural broadleaved woodland

Dense scrub

Tall ruderal

Running water

Tarmac

Target Note Description

TN1

Badger snuffle holes. Rabbit hole with rabbit droppings.

TN2

Badger sett - main sett.

TN3

Resting place under tree for large mammal, possibly otter or badger. Badger snuffle holes close by (1.5metres from resting place).

TN4

Badger trail through vegetation, and snuffles.

TN5

Badger trail through vegetation, and snuffles.

TN6

Cherry laurel hedge along boundary to carpark.

TN7

Badger sett - Three entrance holes, with fresh bedding in entrance of one.

AO	2017-05-22	AO	Preliminary	PW	XX	
Rev.	Date	Drawn.	Description	Chkd.	Appd.	Date.
 Capital Delivery Alliance Cynghrair Cyflawni Cyfalaf Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ						
Project Name.			Minera CSO			
Drawing Title.			Figure 2 Phase 1 Habitat Survey			
Suitability.					Suitability Code.	
Preliminary						
Originator		Designer		Date.		
AO		AO		2016-08-22		
Internal Project Number		Scale		Rev.		
241138-06		1:800		D1		
Drawing Number.						
004						