

CHAPTER 10 – ECOLOGY

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List of Acronyms

ACIEEM	Associate Member of the Chartered Institute of Ecology and Environmental Management
ASNW	Ancient Semi Natural Woodland
BIS	Powys Biodiversity Information Service
BTO	British Trust for Ornithology
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
DM2	Development Management Policy 2 (Powys Local Development Plan)
Development	All activities within the red line planning boundary (see Drawing ECL-BQ-000 in Technical Appendix TA1-1)
Development Site	The physical site on which the Development is to be located as defined by the red line planning boundary (see Drawing ECL-BQ-000 in Technical Appendix TA1-1)
EclA	Ecological Impact Assessment
eDNA	Environmental Deoxyribonucleic Acid
ERF	Energy Recovery Facility
ES	Environmental Statement
EPS	European Protected Species
EPSML	European Protected Species Mitigation Licence
GCN	Great Crested Newt
HRA	Habitats Regulations Assessment
HMP	Habitat Management Plan
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan (Powys)
LDP	(Powys) Local Development Plan
MAGIC	Multi Agency Geographic Information for the Countryside
NRW	Natural Resources Wales
OMH	Open Mosaic Habitat of Brownfield Land
PAWS	Plantation on Ancient Woodland Site
PRF	Potential Roost Feature
PC	Process Contribution
TAN 5	Technical Advice Note 5
RAWS	Restored Ancient Woodland Site
SAC	Special Area of Conservation
sHRA	Shadow Habitats Regulations Assessment
SoNaRR	The State of Natural Resources Report
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SP7	Strategic Policy 7 (Powys Local Development Plan)
SPG	Supplementary Planning Guidance (Biodiversity and Geodiversity)
SUDs	Sustainable Urban Drainage
SWMP	Surface Water Management Plan
TAN	Technical Advice Note
TN	Target Note

List of Amendments

Consultation comments received from Natural Resources Wales (NRW) dated 26 October 2020 (reference CAS-124842-Y2D7) and Powys County Council (PCC) dated 6 November 2020 have been considered within this chapter. The updated chapter includes the following amendments:

- 10.2.18: Sentence added regarding separate phase 1 habitat survey report
- 10.2.41: Section added on invasive, non-native species.
- 10.2.52: Reference added to 2020 bat surveys and new technical appendix.
- 10.2.65: Additional detail on climbed tree surveys added.
- 10.2.71-73: Amended to reflect proposed woodland and scrub loss.
- 10.2.76: Inclusion of dormouse as receptor
- 10.3.6: Reference to habitat loss and gain figures added.
- Table 10-2 Dormouse and semi-natural broadleaved woodland added as receptors.
- 10.3.12: Section added on construction phase impacts on woodland.
- 10.3.17: Amended to reflect proposed woodland and scrub loss.
- 10.3.20-21 Section added on construction phase impacts on dormouse.
- Table 10-4: Updated to include construction phase effects on woodland, dormouse, removal of single oak tree and additional information on reptiles.
- Footnote 6 (page 10-31): Note removed.
- 10.3.35: Section added on operational phase impacts on dormouse.
- Table 10-5: Addition of dormouse, additional information on pond creation and GCN friendly road design.
- 10.3.56-57: Addition of section on dormouse.
- 10.3.62: Updated to reflect amendments to sHRA.
- Table 10-9: Updated to include dormouse and broadleaved woodland, removal of single oak tree and additional measures for badger.
- Table 10-10: Additional detail on GCN friendly road design added.
- Table 10-12: Updated to reflect amendments to sHRA.
- Table 10-13: Addition of woodland, dormouse and removal of single oak.
- 10.6.2: Confirmation of agreed scope of air quality assessment added.
- 10.6.3: Additional information on HMP and reference to habitat loss and gain figures added.

10. ECOLOGY

10.1. Introduction

- 10.1.1. This chapter assesses the impacts of the proposed Buttington Energy Recovery Facility (“ERF”) on ecology/biodiversity.
- 10.1.2. The evaluation and assessment within this chapter has been undertaken with reference to the Guidelines for Ecological Impact Assessment in the United Kingdom developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, September 2018).
- 10.1.3. CIEEM considers it important that the structure and content of EclA reports are standardised but acknowledges that different formats are acceptable and EclA reports should be tailored to suit individual circumstances and Ecological Impact Assessments may be presented in a way that fits the overall style and structure of the Environmental Statement. The structure of this chapter has therefore been set out in a non-standard format to ensure consistency across the disciplines whilst following the CIEEM guidelines with respect to content.
- 10.1.4. The ecological impact assessment (“EclA”) has been informed by desk study, survey work and the responses to a scoping report issued to the Planning Inspectorate in August 2018. Scoping responses from nature conservation stakeholders confirmed that the proposed approach to ecological survey and assessment was appropriate.
- 10.1.5. In their scoping response of 3 October 2018, the Planning Inspectorate commented regarding ecology as follows:
‘In the SR, the Applicant identifies a number of current ecological assessments that have been carried out that will inform the Ecology section of the ES, and these seem largely appropriate. The Applicant should ensure that the baseline data for the assessments conducted are robust, and provide the data necessary to assess any likely significant effects arising from the Proposed Development’.
‘It is noted that the Applicant intends to submit a Habitats Regulations Report (HRA) in order to address the requirements of the Conservation of Habitats and Species Regulations 2017’.
- 10.1.6. Appended commentary from Natural Resources Wales (“NRW”) was as follows:
‘NRW advise that the ES should clearly set out any effects on protected species and, where adverse effects are identified, should propose and deliver appropriate mitigation and/or compensation schemes to ensure the Favourable Conservation Status of the affected species is maintained
With regards to section 10.3, NRW are in agreement with the scope of the ecological survey and assessments that have been carried out for the purposes of informing the planning decision making process. The component ecological submission appropriately and proportionately considers protected species.’

10.2. Relevant Legislation

10.2.1. There are several policies and guidance documents that relate to nature conservation and ecology within the planning process that are relevant to the Development. Reference to these provides an indication of the likely requirements and expectations of statutory authorities and others in relation to planning applications and biodiversity within a given area. Relevant legislation and key national, regional, and local planning policies are set out below.

Environment (Wales) Act 2016

10.2.2. The Environment (Wales) Act 2016ⁱ sets out Wales' approach to planning and managing natural resources at a national and local level.

10.2.3. 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 so doing, public authorities must also seek to '*promote the resilience of ecosystems*'. This is referred to as '*The Biodiversity Duty*.'

10.2.4. Public authorities are required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience, and in particular, measures to improve:

- diversity between and within ecosystems;
- the connections between and within ecosystems;
- the scale of ecosystems;
- the condition of ecosystems (including their structure and functioning);
- the adaptability of ecosystems.

10.2.5. Section 7 of the Act places a duty upon public bodies to maintain and enhance biodiversity and promote the resilience of ecosystems so far as consistent with the proper exercise of their functions. The Act requires Welsh Ministers to publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.

10.2.6. Welsh Ministers are also required to 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.

10.2.7. Due regard should also be had to the letter from Welsh Government dated 23 October 2019 to all heads of planning, in respect of securing biodiversity enhancements. The final paragraph states:

"Securing a net benefit for biodiversity within the context of PPW requires a pragmatic response to the specific circumstances of the site. Working through the step wise approach (PPW para 6.4.21 refers), if biodiversity loss cannot be completely avoided (i.e. maintained), and has been minimised, it is useful to think of net benefit as a concept to both compensate for loss and look for and secure enhancement opportunities. A net benefit for biodiversity can be secured through habitat creation and/or long-term management arrangements to enhance existing habitats, to improve biodiversity and the resilience of ecosystems. Securing a net benefit for biodiversity is

not necessarily onerous; through understanding local context, it is possible to identify new opportunities to enhance biodiversity”.

Protected Sites and Species

- 10.2.8. Other key wildlife and conservation legislation relevant to this assessment includes the Conservation of Habitats and Species Regulations 2017ⁱⁱ (particularly regarding the protection of European designated sites and protected species), the Wildlife and Countryside Act 1981ⁱⁱⁱ (as amended) (particularly regarding the protection of breeding birds and reptiles), and the Protection of Badgers Act 1992^{iv}.
- 10.2.9. In relation to protected European sites, the Habitats Regulations require that the competent authority (in this case the Welsh Ministers) before authorising a project likely to have a significant effect on a European site ‘must make an appropriate assessment of the implications for that site in view of that site’s conservation objectives’. This includes Ramsar sites.
- 10.2.10. To enable Welsh Ministers to determine whether an appropriate assessment is required and comply with the relevant duty under the Habitat Regulations, a shadow Habitats Regulations Assessment Report (“sHRA” Report) has been prepared and submitted with the application in respect of the relevant protected sites (which are treated as European protected sites). As noted below, the evidence demonstrates that no significant effects will be caused and consequently no “appropriate assessment” is necessary.
- 10.2.11. Further information regarding species protection afforded by relevant legislation is contained in Technical Appendix 10-1 - Legislation.

Planning Policy Wales (December 2018)

- 10.2.12. Welsh Government policy objectives for conserving and improving the natural environment are set out in Planning Policy Wales (Version 10, December 2018)^v. These are to:
- *‘Support the conservation of biodiversity, in particular the conservation of wildlife and habitats*
 - *Ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats*
 - *Ensure statutorily and non-statutorily designated sites are properly protected and managed*
 - *Safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat*
 - *Secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.’*
- 10.2.13. Regarding The Biodiversity Duty, the policy states that planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions.

'This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity.'

- 10.2.14. In doing so, planning authorities must also:
'take account of and promote the resilience of ecosystems,' in particular, *'diversity between and within ecosystems; the connections between and within ecosystems; the scale of ecosystems; the condition of ecosystems including their structure and functioning; and the adaptability of ecosystems.'*
- 10.2.15. In fulfilling this duty, planning authorities must have regard to: the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016; Natural Resources Wales' ('NRW') Summary of Natural Resources Report ("SoNaRR"); and any Area Statement that covers all or part of the area in which the authority exercises its functions.
- 10.2.16. Regarding statutorily designated sites, Planning Policy Wales states they must be 'protected from damage and deterioration, with their important features conserved and enhanced by appropriate management. The contribution of the designated site to a wider network of resilient ecosystems should be recognised and captured as part of policy and decision making.'
- 10.2.17. Planning authorities are required to treat species protected under European or UK legislation as a material consideration of planning. They are required to consider whether protected species are present and if the development would *'be likely to result in disturbance or harm to the species or its habitat,'* and to ensure that the ranges and populations of these species are sustained.
- 10.2.18. The policy notes that 'ancient woodland and semi-natural woodlands and individual ancient, veteran and heritage trees are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees and woodlands should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits.'
- 10.2.19. Policy requires consultation with NRW if a site is recorded on the inventory of ancient woodland before authorising potentially damaging operations.

Technical Advice Note 5: Nature Conservation and Planning

- 10.2.20. Technical Advice Note ("TAN") 5^{vi} supplements Planning Policy Wales and provides advice about how the land use planning system in Wales *'should contribute to protecting and enhancing biodiversity and geological conservation.'*
- 10.2.21. The TAN instructs local authorities to consider (when deciding planning applications that may affect nature conservation) the following in their decision making:
- how a proposal will contribute to the protection and improvement of the environment (with a view to seeking to avoid irreversible harmful effects on the natural environment).
 - impacts on designated sites of international, national and local importance.

- protecting wildlife and natural features in the wider environment, through attaching appropriate weight to priority habitats and species in Biodiversity Action Plans (and by inference to Environment Act Wales Section 7 habitats and species).
- ensuring that all material considerations are taken into account and decisions informed by adequate information about the potential effects of a development on nature conservation
- ensuring that the range and population of protected species is sustained
- adoption of the mitigation hierarchy.

Powys Local Development Plan^{vii} Policies and Supplementary Planning Guidance ('SPG') on Biodiversity^{viii}

- 10.2.22. Strategic Policy 7 ('SP7') of the Powys Local Development Plan ("LDP")(adopted in October 2018) concerns the 'Safeguarding of Strategic Resources and Assets.' It states:
'To safeguard strategic resources and assets in the County, development proposals must not have an unacceptable adverse impact on the resource or asset and its operation.'
These assets include:
'Land designated at international, European and/or national level for environmental protection.'
- 10.2.23. Development Management Policy 2 ('DM2') states that:
'Proposals shall demonstrate how they protect, positively manage and enhance biodiversity and geodiversity interests including improving the resilience of biodiversity through the enhanced connectivity of habitats within, and beyond the site.'
- 10.2.24. DM2 includes further detailed policies, many of which seek to replicate regulatory protections. DM2 sets out a presumption against development that affects designated sites (international, national, or local), the overarching aims of the Water Framework Directive, and trees, woodland and hedgerow of significant public amenity, natural or cultural heritage value. Where these features are to be impacted or lost as a result of development it must be demonstrated that there is an overriding need for the work, that alternative solutions have been considered, and that mitigation will be applied to minimise impacts.
- 10.2.25. Supplementary Planning Guidance ("SPG") on Biodiversity and Geodiversity was adopted by Powys in October 2018.
- 10.2.26. The SPG sets out how scheme proponents and the Local Planning Authority ("LPA") can protect biodiversity through the planning process. It details the requirements the planning process places on developers and other applicants to demonstrate how they are protecting biodiversity.

10.3. The Existing Environment

Environmental Assessment Boundary

- 10.3.1. Study Areas were chosen to ensure that the potential for development to affect features outside the Development footprint and/or the potential for mobile species within the wider area to be dependent on the site were appropriately considered.
- 10.3.2. A summary and rationale for study area selection is as follows:

Table 10-1 : Study Areas

Feature	Study Area
International / European Designated Sites (Ramsar Sites, Special Protection Areas, Special Areas of Conservation)	<ul style="list-style-type: none"> • 10 km from Buttington ERF • Sites to be considered in the assessment were agreed in advance with PINS via the Scoping Request (see Section 6.3. of the Air Quality Assessment).
Nationally Designated Sites & Ancient Woodland (includes Sites of Special Scientific Interest), Local Wildlife Sites)	<ul style="list-style-type: none"> • Up to 2 km from ERF • Sites to be considered in the assessment were agreed in advance with PINS via the Scoping Request (see Section 6.3.6 of the Air Quality Assessment).
Protected and Notable Species (Species listed on Annex 1 and 2 of the Habitats Directive, afforded special protection under the Wildlife and Countryside Act and / or considered to be of principal importance for the conservation of biodiversity in Wales).	<ul style="list-style-type: none"> • The Development area and surrounding areas of semi-natural habitat (for context) were the Study Area for survey work • Desk study data for protected and notable species was secured for a wider area (2 km around the ERF) for local context
Habitats of Principal Importance for the conservation of biodiversity in Wales (Habitats listed under Section 7 of the Environment Wales Act, 2016)	<ul style="list-style-type: none"> • All habitats within, directly adjacent to and / or connected to the Development area

Baseline Conditions

Desk Study

- 10.3.3. To inform the selection of Study Areas, information was initially obtained on the presence of statutory designated sites within a wide area around the application site by consulting the MAGIC (Multi Agency Geographic Information for the Countryside) website^{ix} (which also provides Ordnance Survey mapping, indicating the presence of ponds and watercourses), and reviewing aerial imagery provided by Bing^x.
- 10.3.4. To gather existing records and information on non-statutory designated sites and protected or otherwise notable species within the local area, biological data were requested from Powys Biodiversity Information Service ("BIS") in June 2018. A review of previous ecological survey work undertaken (in relation to a previous version of the

scheme) by SLR Consulting in 2015^{xi} and 2016^{xii} was also completed to inform the spatial extent of Study Areas.

Protected Sites

- 10.3.5. There are two Special Areas of Conservation (“SAC”) within 10 km of the ERF; the Montgomery Canal SAC, which is designated due to the occurrence of floating water-plantain *Luronium natans*; and Granllyn SAC, which supports the largest population of great crested newts, in Powys. The respective SACs are approximately 1.8 km and 4.35 km from the ERF.
- 10.3.6. There is one RAMSAR site within 10 km; Midland Meres and Mosses - Phase 1, which is 7.4 km away. This site is designated for its range of lowland wetland habitats and successional stages, including quaking bogs.
- 10.3.7. Two Sites of Special Scientific Interest (“SSSI”) are present within 2 km of the ERF. These are Buttington Brickworks SSSI, which was notified for its geological interest and is directly adjacent to the north-eastern face of the existing quarry void. The SSSI will be fully retained, protected and has been excluded from the site boundary.
- 10.3.8. The Montgomery Canal SSSI shares a common boundary with the SAC of the same name. In addition to the internationally important floating water-plantain population (which is a feature of the SAC), the Montgomery Canal is of special scientific interest for its aquatic, emergent and marginal plant communities, individual rare plants and its invertebrate assemblage.
- 10.3.9. A further SSSI, Moel-y-Golfa, is located just over 2 km from the ERF. It was notified on that basis that it supports the largest area of semi-natural woodland remaining in Montgomeryshire. It also has a notable breeding bird community.
- 10.3.10. No additional non-statutory sites of nature conservation interest have been identified through the data search.
- 10.3.11. The positions of protected sites in relation to the ERF are shown on Figure 10.1 (International and European sites) and Figure 10.2 (SSSIs) in Technical Appendix 10.2 Figures and Target Notes.

Ancient Woodland

- 10.3.12. Ancient woodland is a term applied to sites in England and Wales whose documented history shows them to have been continuously wooded since approximately 1600, and which (as a result of this) are considered likely to have been wooded since the last Ice Age. They support mature soils, and complex and diverse ecosystems.

- 10.3.13. The ancient woodland inventory for Wales indicates that there are twelve areas of ancient woodland¹ within 2 km of the application site. The closest of these is adjacent to the western part of the Development site and includes conifer plantation on an ancient woodland site (“PAWS”) and restored ancient woodland.
- 10.3.14. The location of Ancient Woodland in relation to the site is shown on Figure 10.2 in Technical Appendix 10.2.

Extended Phase 1 Habitat Survey

- 10.3.15. To collect information on habitats present within and adjacent to the Development area, and to determine its potential to support protected species, an extended Phase 1 habitat survey was conducted by an experienced botanist and protected species surveyor, Caroline O’Rourke ACIEEM, on 16 July 2018. This was updated on 12 May 2020 to identify any changes to the baseline. The survey work was completed, and habitats mapped based on industry standard guidance (JNCC, 2010)^{xiii}.
- 10.3.16. The Phase 1 surveys were extended, in accordance with IEA (1995)^{xiv}, to include an assessment of the suitability of the habitats present to support protected (and non-native invasive) species.
- 10.3.17. Where there were ecological features that were too small to map (typical examples included signs of protected species (e.g. badger *Meles meles* latrines) or very discrete areas of notable habitat), a description of these was taken and cross referenced to a number on the field map (Target Notes (“TNs”). TNs are presented in full in Technical Appendix 10-2, where they are cross-referred to photographs of the feature concerned.

Habitats

- 10.3.18. Habitats within and adjacent to the land ownership are described below. A separate Phase 1 survey report is not provided to avoid unnecessary duplication of information. The type and extent of the habitats recorded is shown on Figure 10.3. This is included in Appendix 10-2 along with the corresponding target notes and photographs.

Bare Ground

- 10.3.19. Bare ground includes all areas with no significant vegetation cover. Within the quarry base in which the ERF will be located, along all existing tracks within the Development footprint and the majority of the four laydown areas, the ground is compacted and largely bare of vegetation (see Figure 10.3 in Appendix 10-2). Common plant species occur sparsely. These include greater plantain *Plantago major*, creeping cinquefoil *Potentilla reptans*, curled dock *Rumex crispus*, creeping thistle *Cirsium arvense* and dandelion *Taraxacum officinale* agg. Damp areas support a few plants of creeping bent *Agrostis stolonifera* and jointed rush *Juncus articulatus*.

¹ This can be further sub-divided into ancient semi-natural woodland, plantation on ancient woodland sites and restored ancient woodland.

- 10.3.20. Bare ground also occupies large parts of the more recently disturbed quarry sides, particularly in the north-eastern part of the Development footprint in contrast to the quarry floor and laydown areas, these have a loose substrate. Vegetative cover is absent or extremely sparse, and consists of scattered plants of wood sage *Teucrium scorodonia*, colt's foot *Tussilago farfara*, teasel *Dipsacus fullonum* and hoary willowherb *Epilobium parviflorum*.

Ephemeral/short perennial vegetation

- 10.3.21. Ephemeral/short perennial vegetation is the dominant habitat type in previously worked areas of the quarry where the substrate is not compacted. Vegetation cover, composition and stage of succession varies with differences in topography, hydrology, and disturbance levels.
- 10.3.22. The less recently disturbed quarry sides have a relatively consistent topography and support an open vegetation community characterised by frequent but sparsely distributed wood sage, colt's foot and teasel and occasional perforate St John's wort. Common centaury *Centaureum erythraea*, black medic *Medicago lupulina*, bird's foot trefoil *Lotus corniculatus*, and greater plantain occur rarely. This vegetation occurs in a mosaic with bare, loose substrate, patches of pointed spear moss *Calliergonella cuspidatum* and tall ruderal herbs including great willowherb *Epilobium hirsutum* and hoary willowherb *E. parviflorum*.
- 10.3.23. The least disturbed and more topographically varied areas, particularly along the disused tracks around the top of the quarry (e.g. TN 5) support more diverse vegetation. Patches of bare ground, early successional communities dominated by mosses including *Brachythecium rurabulum*, *Calliergonella cuspidatum* and *Hypnum cupressiforme*, open areas with mixtures of annual and perennial species such as squirreltail fescue *Vulpia bromoides*, procumbent pearlwort *Sagina procumbens* common centaury, bird's foot trefoil, wood sage, creeping cinquefoil, teasel, and selfheal, and more established, but still open neutral grassland and stands of tall ruderal habitat are present. Characteristically of this vegetation type there is no obviously dominant species.

Scrub

- 10.3.24. Small stands of dense scrub occur within and adjacent to the Development area. These are generally fragmented in nature, occurring on marginal ground and in association with unmanaged hedges/field boundaries around the edges of the land ownership. Bramble and grey willow are the most frequently encountered species with occasional gorse and elder.
- 10.3.25. Scattered young willow and gorse scrub is also a frequent component of quarry side vegetation. Clumps of bramble are frequent, generally encroaching into unmanaged areas in association with tall ruderal vegetation, particularly around the eastern part of the Development area.

Settlement lagoons

- 10.3.26. Two settlement lagoons are located at the entrance to the main quarry void (Target Notes 2 and 3). Frequent algae indicated nutrient enrichment; however, both contained a moderate diversity of macrophytes including frequent broad-leaved pondweed *Potamogeton natans*, and occasional common water plantain *Alisma plantago-aquatica* and great reedmace *Typha latifolia*. The lagoon at Target Note 2 was heavily shaded by adjacent woodland and connected to a small stream via a narrow ditch.

Ephemeral pools

- 10.3.27. Ephemeral pools were present in several shallow, man-made excavations in the quarry floor (Target Notes 1 and 4). These were largely un-vegetated with a little algae and great reedmace at the time of survey.

Stream

- 10.3.28. A small, shallow stream follows part of the existing access road to the quarry void. The stream is slow flowing with steep earth banks and bordered by woodland with no aquatic or marginal vegetation other than small patches of soft rush *Juncus effusus* on the northern bank.

Ruderal

- 10.3.29. Tall ruderal vegetation occurs commonly to the south and east of the Development, typically associated with the fringes of the operational quarry area, trackways and completed sections of the consented screening bund. It is generally present in discrete stands on areas of disturbed organic substrate. Species present include frequent great willowherb *Epilobium hirsutum*, rosebay willowherb, common nettle *Urtica dioica*, teasel *Dipsacus fullonum* and creeping thistle *Cirsium arvense*, occasional broad-leaved dock *Rumex obtusifolius*, curled dock *R. crispus* and hogweed *Heracleum sphondylium* and, more rarely, great mullein *Verbascum thapsus*.

Woodland

- 10.3.30. Woodland dominated by European larch *Larix decidua* borders the northern edge of the Development area (part of this woodland is the PAWS – see section 10.3.13). This woodland has a closed canopy that casts heavy shade. The understorey is subsequently poorly developed, and is limited to scattered ash *Fraxinus excelsior*, holly *Ilex aquifolium* and elder *Sambucus nigra* saplings with occasional sycamore *Acer pseudoplatanus*, hawthorn *Crataegus monogyna* and pedunculate oak *Quercus robur*.
- 10.3.31. The ground flora is suppressed by a thick layer of needles and is limited to occasional bramble *Rubus fruticosus* agg, wood sage *Teucrium scorondia* and rosebay willowherb *Chamaerion angustifolium*. The plantation grades into a secondary broadleaved woodland of ash and sycamore to the north which is similarly shaded with a sparse

understorey. A few additional ground flora species are present here including dog's mercury *Mercurialis perennis*, common male fern *Dryopteris filix-mas* and broad buckler fern *D. dilatata*. Ivy *Hedera helix* is the dominant species throughout.

- 10.3.32. Woodland to the west of the area of plantation contains several semi-mature oak trees *Quercus robur*, but is mainly composed of sycamore and ash with a moderately dense understorey of grey willow, hazel *Corylus avellana* and dog rose *Rosa canina*. The ground flora here is limited to low growing bramble and occasional ruderal herbs such as rosebay willowherb.
- 10.3.33. Lle (2018)^{xv} data indicates this woodland is a mixture of plantation on an ancient woodland site (the woodland adjacent to the Development area) and (further west) restored ancient woodland. A strong linear habitat feature extends along the line of a dismantled railway between the woodland and the A458 approximately 2.5 km to the north; it is dominated by scrub and developing woodland and is likely to provide a commuting / dispersal corridor through the area for various species.
- 10.3.34. A strip of secondary broadleaved woodland associated with a small stream runs adjacent to the south-western land ownership boundary. This is dominated by alder *Alnus glutinosa*, with occasional crack willow *S. fragilis* and ash and a dense understorey of grey willow *Salix cinerea*, bramble and infrequent European gorse *Ulex europaeus*.
- 10.3.35. Areas of recently felled woodland occur at the western fringes of the conifer plantation and the proposed new access from the A458. These are largely comprised of bare ground/litter with a sparse cover of coarse grasses such as Yorkshire Fog with occasional foxglove *Digitalis purpurea*, wood sage and some ruderal species including common nettle and rosebay willowherb.

Hedgerows

- 10.3.36. Several native hedgerows are present in the eastern part of the land holding. These include remnant field boundaries, which are currently unmanaged and developing into blocks of scrub, and a regularly trimmed roadside hedge along Sale Lane which supports several mature hedgerow trees. The hedgerows are generally fragmented with poor connectivity to the wider landscape, except for the hedge along Sale Lane. Species include frequent hawthorn, blackthorn *Prunus spinosa* and hazel with occasional sycamore, ash, grey willow, oak, elder and holly.

Poor semi-improved grassland

- 10.3.37. Semi-improved neutral grassland occurs in the remnant field system in the eastern part of the land ownership. The field adjacent to Sale Lane (which demarcates the eastern Site boundary) is the location of the consented landscape screening bund which is currently under construction. A narrow strip of remaining grassland is present adjacent to the eastern boundary hedgerow.
- 10.3.38. This vegetation is rank in structure and dominated by coarse grasses including frequent false oat-grass *Arrhenatherum elatius*, Yorkshire fog *Holcus lanatus*, cock's-foot *Dactylis*

glomerata and timothy *Phleum pratense*. Herb diversity is low with occasional common knapweed *Centaurea nigra*, tufted vetch *Vicia cracca*, meadow buttercup *Ranunculus acris*, common ragwort *Senecio jacobea*, red clover *Trifolium pratense*, hogweed and broadleaved dock.

Semi-improved neutral grassland

- 10.3.39. The grassland at Target Note 7 appears to be subject to some level of management and/or rabbit grazing and has a short sward with some ruderal and scrub encroachment from the margins. This grassland is of moderate diversity with frequent sweet vernal grass, Yorkshire fog and red fescue and occasional crested dog's tail and common bent. Herbs include frequent Creeping cinquefoil *Potentilla reptans*, white clover *Trifolium repens*, selfheal *Prunella vulgaris* and meadow buttercup, and occasional bird's foot trefoil *Lotus corniculatus*, smooth tare *Vicia tetrasperma*, common centaury and common knapweed.
- 10.3.40. Small fragments of semi-improved neutral grassland have also developed from ephemeral/short perennial vegetation around the top of the quarry (e.g. Target Note 5). This grassland is characterised by a low cover of grasses including with a diverse mixture of herbs. Grasses include false oat grass, crested dog's-tail and occasional squirreltail fescue. Herbs include abundant common knapweed and bird's-foot trefoil, frequent perforate St John's wort, common and ox-eye daisy and occasional common centaury and creeping cinquefoil.

Invasive species

- 10.3.41. No invasive species were recorded during the 2018 Phase 1 habitat survey or 2020 update.

Great Crested Newts – 2020 Review

- 10.3.42. No records of great crested newt *Triturus cristatus* were returned by BIS for the 2 km perimeter search area around the site. Study of aerial photographs and maps did not result in any ponds being identified within 500 m of the land ownership boundary (other than those within the Site).
- 10.3.43. Environmental DNA ("eDNA") survey for great crested newt was completed at the two settlement lagoons within the site boundary in April 2020 in accordance with Freshwater Habitats Trust (2015) guidance. Samples were analysed by Sure Screen Consulting and returned a positive result for great crested newt from the northern of the two lagoons.
- 10.3.44. Four evening torch surveys were subsequently undertaken between 12th and 29th May to determine the population class size. The lagoons were inspected for great crested newt using a high-powered torch and binoculars by a team of two surveyors.
- 10.3.45. During the four torch surveys a single male great crested newt was recorded in the northern lagoon, indicating a low population class size.

Great Crested Newts – Previous work

- 10.3.46. Both lagoons had previously been subject to eDNA survey (data collected by BSG ecology in 2018 and SLR Consulting in 2015), and returned negative results for GCN.
- 10.3.47. A further pond (a shallow depression) initially identified by BSG Ecology in 2018 was unsuitable for eDNA survey due to its depth and limited extent. The only plant species present was common reedmace. This pond was subject to systematic torch searching in June 2018 which found palmate newts *Lissotriton vulgaris* (which are not subject to the same levels of protection as great crested newt) to be present.

Bats - Desk study

- 10.3.48. Bat records returned by BIS indicate that common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentonii*, lesser horseshoe bat *Rhinolophus hipposideros*, noctule *Nyctalus noctula* and Natterer's bat *Myotis nattereri* have been recorded within the 2 km perimeter search area. No bat records were returned by BIS for the Development footprint, albeit brown long-eared bat has been noted within the western part of the quarry.
- 10.3.49. SLR concluded that the quarry faces had no potential to support roosting bats, but that there were a few trees within the wider landholding with some roost potential. These were all located outside the Development site; one, an oak, was considered to have high roosting potential due to rot holes, cracks / splits in the main trunk and limbs and a covering of ivy. The other trees were considered to have low roost potential.
- 10.3.50. Bat surveys undertaken in July and August 2015 by SLR involved two walked transects. These were predominantly through semi-natural habitats to the south of the Development area. SLR concluded that a minimum of five species occurred locally, and that activity levels were low.

Bats - Walked transect and automated detector surveys

- 10.3.51. The existing quarry void is of very low potential value to bats. However, habitats within the wider Development Site (around the periphery of the quarry; within the planning boundary but outside of the development footprint) are of medium value (an opinion reflected in scoping responses from nature conservation stakeholders to a previous proposal for the site (SLR, 2017). The level of survey effort undertaken was therefore in accordance with industry standard guidance for a medium sensitivity site (Collins, 2016).
- 10.3.52. Walked bat activity surveys and static detector deployments were completed monthly between May and October 2018 inclusive and updated in 2020. Results of the 2020 bat surveys are set out in Technical Appendix 10.4.
- 10.3.53. The route of the transect and the locations of the three static detectors used at the site were designed / selected to sample both the footprint of the ERF and semi-natural

habitats within and adjacent to the Development area. Static detectors were deployed to collect data for a period of five consecutive nights each month. The transect route and the position of the detectors are shown on Figure 10.4 in Appendix 10-2.

- 10.3.54. Walked transect surveys and static detector work completed in 2018 and 2020 proved complementary to that reported by SLR in 2015 in establishing an understanding of bat use of the area.
- 10.3.55. The transect surveys found that bat activity was concentrated in the western part of the land holding close to the woodland edge, and along the hedge-line on the north-eastern boundary. Activity within and over the quarry base was limited to a few commuting pipistrelles and noctules², with a more diverse bat community recorded in the wider area (around the fringes of the pit).
- 10.3.56. A minimum of ten species of bat were recorded within the wider land ownership. These species were: barbastelle bat *Barbastella barbastellus*, common pipistrelle, Leisler's bat *Nyctalus leisleri*, lesser horseshoe bat, brown long-eared bat (presumed), *Myotis* sp., Nathusius' pipistrelle *Pipistrellus nathusii*, noctule, serotine *Eptesicus serotinus* and soprano pipistrelle.
- 10.3.57. Contextual information from the static detectors indicated that roosts of several species were likely to be present in woodland to the north of the site (outside the Development Site (DNS boundary) and potentially in trees within the Development Site (within the DNS planning boundary)³. These conclusions were based on:
- 370 soprano pipistrelle passes within 20 minutes of (between 0 and 20 minutes after) sunset from Detector D1 (located on the edge of woodland to the north of the Development site).
 - 225 common pipistrelle passes within 20 minutes of sunset from Detector D1.
 - 22 noctule passes within 40 minutes of sunset at D1 and a further 41 and 35 passes at D2 and D3 respectively during the same period.
- 10.3.58. These records are all within the known emergence periods of the bat species concerned, strongly suggesting local roosting.

² Noctule is a species with strong flight that moves through the landscape (often at considerable height) without closely following linear features (such as hedgerows or watercourses). There was no evidence that these animals were reliant on the quarry or the airspace above it.

³ Two of which were upgraded from low to medium roost potential during the Phase 1 survey (both are well outside the Development Area).

Bats - Assessment of roosting potential (quarry faces and trees)

- 10.3.59. During the extended Phase 1 survey an assessment was made of the potential of the quarry faces and trees within and immediately adjacent to the Development area to support roosting bats.
- 10.3.60. The quarry faces are of negligible roosting potential, being of mudstone with no cracks, crevices, or other Potential Roost Features ("PRFs") suitable for roosting bats.
- 10.3.61. Two trees were determined to have some potential to support roosting bats, an oak at Ordnance Survey grid reference SJ26941011 and an ash at SJ27001019. These were subsequently subject to a detailed survey in August 2018.
- 10.3.62. Ground level inspections were carried out by Gareth Lang (survey licence S085345/1) in August 2018. Work was undertaken in suitable (dry) weather conditions, using binoculars and an endoscope where necessary to assess trees from the ground. For each tree deemed to have potential to support bats, the tree species, and a description of any PRF(s), including its height and aspect, were recorded. Where possible, PRFs were checked for evidence of use by bats, such as characteristic oil staining, scratch marks and droppings.
- 10.3.63. The ash was classified as having low potential for roosting bats and the oak as having high potential.
- 10.3.64. The oak was subsequently subject to a climbing inspection by bat licenced, qualified tree climbers in July 2019. During the climbing inspection, the PRFs identified in the ground-based assessment were investigated to gain a more accurate baseline of information as to their suitability for bats and examined for evidence of bat use.
- 10.3.65. During the inspection individual PRF on the oak were downgraded to low and moderate potential. In accordance with best practice guidance (Collins, 2016) the tree was inspected a second time on (20 August 2019). No evidence of bat use was recorded during either inspection.

Birds - Desk study

- 10.3.66. BIS returned no bird records for the quarry, and limited information for the wider area. Most of the records that were returned referred to common and widespread species, a few of which are Section 7 (priority) species. These include barn owl *Tyto alba*, which records suggest is locally widespread in farmland in the wider area and may forage over grassland within the land ownership. Barn owl was not recorded during any of the survey work however, and the Development area has no suitable foraging or breeding habitat for the species. Other priority bird species are house sparrow *Passer domesticus* and starling *Sturnus vulgaris*, which have been noted around farms and villages in the area and are likely to breed locally.
- 10.3.67. SLR did not conduct bird surveys of the Development site as part of their work in 2015 and 2016.

Birds - Field survey

- 10.3.68. A breeding bird survey of the Development area and adjacent semi-natural habitats was completed monthly between May and July 2018 inclusive.
- 10.3.69. A transect was walked that ensured all parts of the study area were sampled. The start and end points of the transect, and the direction of travel, were varied between visits to ensure representative coverage. Standard British Trust for Ornithology (“BTO”) species and activity codes were used to indicate bird species and behaviour and transcribed onto field maps.
- 10.3.70. The results of the three surveys were considered in combination. A precautionary approach was taken; species exhibiting territorial behaviour⁴ on one or more of the visits, and in suitable habitat, were considered likely to be holding territory.
- 10.3.71. Survey work completed by BSG Ecology in 2018 found that the Site supports a range of common and widespread species including several red and amber listed species. Several species were recorded as potentially breeding within the Development footprint. These include willow warbler *Phylloscopus trochilus*, linnet *Linaria cannabina*, chiffchaff *Phylloscopus collybita*, wren *Troglodytes troglodytes*, whitethroat *Curruca communis*, blackbird *Turdus merula*, blue tit *Cyanistes caeruleus*, collared dove *Streptopelia decaocto* and long-tailed tit *Aegithalos caudatus*. The majority of territories were associated with the woodland around the Site boundaries and scrub in the former field system south of the main quarry void. A single blue tit territory was recorded within scrub on the side of the main quarry void.
- 10.3.72. The quarry base and faces provide little cover, and the nature of the mudstone is that it does not form ledges and crevices suitable for cliff-nesting species. No evidence of ground or cliff nesting species was recorded. Flocks of Corvids (raven *Corvus corax* and carrion crow *Corvus corone*) were recorded loafing within the quarry and may use the freshwater pools for drinking; these species actively predate the nests and young of ground-nesting birds, reducing the potential for ground-nesting species to occur in future / the baseline to vary between years.
- 10.3.73. The bird community of the wider landholding included various common and widespread scrub and woodland-nesting species including wood pigeon *Columba palumbus*, and blackcap *Sylvia atricapilla*. Nests and/or fledglings of swallow *Hirundo rustica*, whitethroat, blue tit, carrion crow, and long-tailed tit were noted within the survey area, the swallows being associated with operational quarry buildings close to the A458. Linnet was recorded in scrub south of the main quarry void. It is a red listed species but remains common in Powys and in Wales as a whole.
- 10.3.74. Species of note were wood warbler *Phylloscopus sibilatrix* and quail *Coturnix coturnix*, which were recorded during one of the bird surveys and (incidentally) during a bat survey respectively. Wood warbler is a declining species associated with upland oak woodland with a sparse understorey; habitats within and adjacent to site are not suitable to support a breeding pair, and the bird was probably on passage. Quail was heard calling on or

⁴ Territorial behaviour included singing, alarm calling, territorial dispute and distraction displays.

over⁵ farmland well outside the site boundary. It is listed under Schedule 1 of the Wildlife and Countryside Act 1981, and is a scarce breeding bird in Powys, with populations fluctuating between years (Green, 2002).

10.3.75. Indicative territory locations are shown on Figure 10.5 in Appendix 10-2.

Dormouse – desk study and habitat assessment

10.3.76. BIS returned no records of dormouse *Muscardinus avellanarius* within 2km of the Site. Broadleaved woodland and scrub habitats within the landholding offer some suitable habitat for dormouse. Areas of scrub south of the main quarry void have developed from unmanaged hedgerows in some areas of the former field system. These have low potential to support dormice given that they are relatively young and fragmented and surrounded by minor barriers to dispersal (existing access tracks and areas of open habitat) to the south, east, and west and the more substantial barrier of the existing quarry void to the north.

10.3.77. The woodland and scrub along the stream on the western Site boundary has a suitable structure for dormice to nest with a dense understorey of predominantly grey willow and bramble. It also has some connectivity to hedgerows and areas of broadleaved woodland, including small areas of ancient woodland, in the surrounding landscape via the stream corridor but is species poor and likely to be of limited value for foraging. This woodland has moderate potential to support dormice (if present).

Other Protected Species

10.3.78. The scoping responses provided by PINS confirmed that further survey for additional species was not necessary to support the Ecological Impact Assessment for the site, based on the results of the Phase 1 survey and previous work completed by SLR.

10.3.79. The extended Phase 1 survey concluded that it was possible that otter *Lutra lutra* could use the small stream within the land ownership on an occasional basis, but that connectivity to larger watercourses in the area was poor (there are narrow round culverts under the quarry and the watercourse is also culverted under the road and railway to the west). Regular use is therefore very unlikely to occur, and no field signs were recorded.

10.3.80. Suitable terrestrial habitat for reptiles is limited to the more structurally diverse areas of habitat around the top of the quarry void, at the edges of the former field system and around the fringes of the wider Site. The quarry floor offers minimal opportunities for reptiles due to a lack of cover.

10.3.81. [REDACTED] The nature of these records (e.g. setts / other field signs, sightings of animals) was not provided by BIS. SLR did not record evidence of badger setts within the land ownership boundary but did note a paw print on wet ground during a site visit in 2016.

⁵ Quail are known to call in flight. The species was either passing through or holding territory in arable land within the wider area. Calling was not recorded during other bat (the species is often vocal at night or at dawn / dusk) or bird survey work.

- 10.3.82. [REDACTED] (this did not cover the full extent of the woodland). These were a three-entrance (one of which was partially collapsed) outlier or small subsidiary sett with no evidence of recent occupancy by badger, and a two-entrance outlier sett, with more recent signs of use, suggesting it had been occupied in the spring. A path heading east / west along the contour linked the two setts, and latrines were evident (none with fresh dung). Rabbit activity was widespread in the area; rabbits had expanded the subsidiary sett through the creation of additional holes, and their droppings were abundant around it.
- 10.3.83. The respective setts were checked for any changes in status or apparent use on 3 October 2018, 16 March 2020 and 12 May 2020. None were noted.
- 10.3.84. [REDACTED]
- 10.3.85. [REDACTED]
- 10.3.86. Other species such as hedgehog *Erinaceus europaeus* are known from the area from BIS data, and may use habitats within and adjacent to the land holding for foraging and shelter.

Limitations

- 10.3.87. There were no limitations to the work undertaken in 2018. Surveys were completed at optimal times of year, by suitably qualified and experienced surveyors, and in appropriate weather. The scope of the work was acceptable to consultees.
- 10.3.88. Planned updates to the walked bat activity transects in April and May 2020 were not completed due to limited resources during the Covid-19 pandemic. Data was however collected by the static detector survey, which proceeded as planned.
- 10.3.89. Given the extensive baseline information already collected and the complimentary results of bat survey work undertaken in 2015 (by SLR) and in 2018 (by BSG) the lack of an additional walked transect during these two months in 2020 is not considered a significant limitation to the survey method or the conclusions of the assessment.
- 10.3.90. The 2020 GCN population class size assessment was subject to several limitations. Industry standard guidance recommends six surveys using three different methods between mid-March and mid-June, with at least three surveys in the peak period (mid-April to mid-May).
- 10.3.91. It is not possible to complete bottle trapping, egg-searching, or netting due to the bank profile, potential sludge, and water depth in the lagoons, which represent a significant hazard to surveyors. As they also have a function (i.e. as silt traps) after any period of rain the lagoons become cloudy, restricting visibility for torch surveys.
- 10.3.92. In practical terms it is therefore extremely challenging to survey the lagoons in a conventional manner. The access constraints were discussed with the LPA ecologist and an approach consisting of torch surveys only agreed prior to commencing this element of the work.
- 10.3.93. Limited resources during the Covid-19 pandemic meant two surveys, rather than the three required were completed by mid-May, with a fourth survey completed by the end of May. Poor weather conditions in the first half of June resulted in restricted visibility in the lagoons and unsuitable survey conditions. A total of four of the required six surveys were completed.
- 10.3.94. Whilst it is possible that GCN numbers recorded may represent an underestimate given the survey limitations, the survey results combined with contextual information indicate the pond is currently unlikely to support more than low numbers of GCN. This contextual information includes previous work i.e. the negative eDNA results in 2015 and 2018, the low number of positive replicates in the 2020 sample (6), and confirmation from the landowner that annual de-silting operations were not undertaken in 2018 or 2019, allowing the establishment of marginal vegetation. This combined information supports the conclusion that the pond has been recently colonised by GCN and unlikely to support a breeding population.

Likely Future Conditions

- 10.3.95. In the absence of development, the vegetative characteristics of the Development area, and its value to / use by protected species are unlikely to significantly change in the short to medium term.
- 10.3.96. The quarry is licensed to continue operation (clay and shale extraction) until 2042. In the medium to long term, if quarrying operations continue, the amount of early successional habitats such as ephemeral/short perennial and ruderal vegetation and grassland is likely to fluctuate in accordance with working areas changing.
- 10.3.97. The site is allocated for B1, B2 and B8 industrial use (light industrial, general industrial and storage / distribution) in the Powys LDP. It is also noted in the LDP that the site may be suitable for the storage and processing of inert waste.
- 10.3.98. If the site is to be developed for industrial use, this will be likely to accelerate its restoration. In practice this will involve levelling of the quarry base and stabilisation of the faces to make it suitable for redevelopment. As a result of this process it is anticipated that the OMH on site will be wholly or partially lost. Effects on other habitats are unclear and will depend on the specification of individual development proposals.

10.4. Environmental Effects Assessment

- 10.4.1. The evaluation and assessment within this chapter has been undertaken with reference to the Guidelines for Ecological Impact Assessment in the United Kingdom developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, September 2018). The methodology is summarised below and set out in full in Technical Appendix 10-3.
- 10.4.2. The initial step is to determine the importance of ecological features based on a geographical scale and/or legal protection. Features which require mitigation in order to ensure legal compliance are considered to be important features, even if their conservation value is low or not applicable (e.g. badger, which is not a rare species but which receives legal protection on animal welfare grounds). Features of less than local importance are generally considered unlikely to trigger mitigation or conflict with policy.
- 10.4.3. Important features likely to be subject to effects resulting from the Development are then taken forward for detailed assessment.
- 10.4.4. The significance of ecological effects (both beneficial and adverse) is then assessed for each phase of the Development, first in the absence of mitigation and then with identified mitigation measures incorporated (residual effects). The assessment of significant effects considers the baseline conditions to describe how conditions will change because of the project and associated activities and any cumulative effects of the proposal and those arising from other developments.
- 10.4.5. Finally, compensation to offset any residual effects and opportunities for ecological enhancement are identified.

Important ecological features

10.4.6. Important ecological features which could potentially be affected by the Development (for example through direct habitat loss, habitat degradation through pollution effects or physical harm to wildlife) are listed in Table 10-2. The effect of the Buttington EFR on these features are discussed for each Development phase in the following sections. The extent of habitat loss, restoration and creation is illustrated on Figure BT1180-D15 in Technical Appendix 10.2.

Table 10-2: Important Ecological Features

Feature	Geographical Level of Importance	Rationale for Inclusion in Detailed Assessment
Montgomery Canal SAC Granllyn SAC	International	Special Areas of Conservation (SACs) are designated sites under the EC Habitats Directive based on their international importance in supporting European Priority Species and Habitats (listed under Annexes 1 and 2 of the Habitats Directive).
Midland Meres and Mosses RAMSAR (Phase 1)	International	RAMSAR are designated as wetlands of international importance especially as waterfowl habitat under the 'Ramsar Convention' (Iran, 1971).
Montgomery Canal SSSI Moel-y-Golfa SSSI	National	Sites of Special Scientific Interest (SSSIs) are nationally designated sites, which are protected for their biological or geological interest under the Wildlife & Countryside Act (1981) as amended.
Ancient Woodland	National	Ancient woodland (including ASNW, PAWS and RAWS) is considered to be an irreplaceable habitat of which there is a finite resource in the UK.
Open Mosaic Habitat on Previously Developed Land	Local	Open Mosaic Habitat on Previously Developed Land ("OMH") is a habitat of principal importance for the conservation of biodiversity in Wales under Section 7 of the Environment Act 2016. Most of the worked areas within the land holding qualify as OMH based on JNCC (2010) criteria, excluding the compacted bare substrate in the quarry bottom, laydown areas and some of the unvegetated faces (marked as bare ground on Figure 10.3).
Native broadleaved woodland	Local	Mixed broadleaved woodland is a habitat of principal importance for the conservation of biodiversity in Wales under Section 7 of the Environment Act 2016. Small areas of this habitat fall within the planning application boundary.

Table 10-2: Important Ecological Features (cont)

Feature	Geographical Level of Importance	Rationale for Inclusion in Detailed Assessment
Settlement Lagoons	Site	<p>The settlement lagoons support some native plant species, a population of great crested and palmate newts, and provide a year-round drinking opportunity for mammals and birds.</p> <p>Due to the presence of great crested newt (a Habitats Directive Annex II species) the lagoons meet the criteria for a priority (Section 7) habitat (ponds), as set out in Maddock [Ed], 2008.</p>
Stream	Local	<p>The stream is a minor, unnamed tributary watercourse of Pwll Trewern.</p> <p>All streams are classified as priority habitat in the Powys Local Biodiversity Action Plan ("LBAP").</p>
Bats	County	<p>The Development area has limited bat interest.</p> <p>A diverse bat assemblage has been recorded making use of the wider land holding. There are strong indications that noctule and two species of pipistrelle roost within woodland adjacent to the site.</p>
Breeding birds	Site	<p>The Development area was found to support a small number of territories of common species in 2018. Legislative consideration only.</p>
Badger, Hedgehog,	n/a	<p>The main quarry void has very low potential to support these species, [REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>Badger and hedgehog require consideration in legislative and welfare terms, but significant impacts on them or issues with legislative compliance are very unlikely / can be avoided through method statements.</p>
Dormouse	Site	<p>Scrub habitats to the south of the main quarry void are fragmented and have limited potential to support dormouse.</p> <p>Woodland along the western boundary and hedgerows bordering the Site are of moderate potential for dormice, offer better connectivity to the wider landscape and may support the species if present locally. However, the potential for dormice to occur is considered low given the lack of local records.</p>

Table 10-2: Important Ecological Features (cont)

Feature	Geographical Level of Importance	Rationale for Inclusion in Detailed Assessment
Great crested newt	Site	<p>The northern settlement lagoon supports a low population of great crested newts which survey results indicate have colonised in the last two years.</p> <p>The wider landscape is known to support a high density of great crested newt (Granllyn SAC, which supports the largest population in Powys is approximately 4.35 km from the Site).</p>
Reptiles	n/a	<p>The quarry void, existing laydown areas and access tracks have very low potential to support reptiles and are therefore considered of negligible value for this species group.</p> <p>Reptiles are likely to occur within the wider land parcel and will therefore need to be considered in legislative and welfare terms. Significant impacts on them or issues with legislative compliance are very unlikely / can be avoided through method statements.</p>

10.4.7. Features which have been scoped out of further assessment are listed along with the rationale for doing so in Table 10-3.

Table 10-3: Ecological Features Scoped out of Further Assessment

Feature	Geographical Level of Importance	Rationale for Exclusion from Detailed Assessment
Buttington Quarry SSSI	National	The site is a geological SSSI. Impacts on it are not relevant to the ecological assessment. The SSSI is excluded from the Development Site, protection measures during the construction phase are described in the outline Construction and Environmental Management Plan which may be found as Technical Appendix 4-3.
Other habitats	Local	<p>Poor semi-improved and semi-improved neutral grassland, hedgerow, scrub and tall ruderal vegetation are also present within the land ownership but either fall outside the Development area and/or are common and widespread habitats of low conservation value.</p> <p>Felled woodland (access road location) is of negligible conservation value.</p>

Construction Phase effects – Designated Sites

- 10.4.8. No habitat loss or damage to designated sites resulting from the Development is anticipated.
- 10.4.9. Impacts arising from dust and vehicle/plant emissions are anticipated to be restricted to within 100 m of the construction area (see sections 6.4. of the Air Quality Assessment).
- 10.4.10. The nearest designated site is the Montgomery Canal SAC, the closest part of which is approximately 1.8 km to the west of the Site. Given that the two locations are separated by existing built infrastructure, farmland, and the River Severn, direct or indirect impacts on habitats within the SAC and the more distant sites are not anticipated.

Construction Phase effects – Ancient Woodland

- 10.4.11. There is potential for ancient woodland to be affected by dust drift from site preparation works, resulting in changes to soil pH within the woodland. The nearest area of ancient woodland (abutting the Development site to the north) is classified as a PAWS.

Construction Phase effects – native broadleaved woodland

- 10.4.12. Earthworks to accommodate the new settlement lagoon and vehicle access will require the removal of approximately 0.2 ha of broadleaved woodland.

Construction Phase effects – Open Mosaic Habitat

- 10.4.13. While most of the Development will be on compacted non-vegetated ground that does not represent OMH, earthworks to alter the existing landform and planting of new woodland required for screening purposes will require the removal of approximately 1.5 ha of this habitat.

Construction Phase effects – Settlement lagoons

- 10.4.14. The two existing settlement lagoons will be lost under the proposals and replaced with a single, larger attenuation feature as part of the landscape and drainage strategy. In addition, a series of smaller ponds and associated terrestrial habitat suitable for great crested newt and other wildlife will be created outside of the Development footprint, along the boundary of the land holding.

Construction Phase effects– Stream

- 10.4.15. The stream runs directly adjacent to the proposed access road. Site preparation and construction activities have potential both to directly damage the banks and to generate waterborne pollutants such as chemicals (fuel, oil etc.) and silt from movement of heavy plant and landform modification within the existing quarry void, which could result in habitat degradation within the stream should they become mobilised via surface waters.

Construction Phase effects– Bats

- 10.4.16. Light spill from construction activities has potential to impact on bats using habitats adjacent to the Site for roosting, foraging, and commuting.

Construction Phase effects– Breeding Birds

- 10.4.17. There will be loss of approximately 1.4 ha breeding bird habitat (woodland and scrub). This supported a small number of territories of common bird species in 2018) during site preparation works. This loss of nesting habitat will be offset by the 4 ha of new woodland planting incorporated into the landscape plan, which will provide a net increase in suitable nesting habitat post-construction. Other effects (destruction of nests) can be avoided through method statements secured by condition. There will also be on-going legislative protections which must be complied with during construction works.

Construction Phase effects– Badgers and Hedgehogs

- 10.4.18. There is some potential for physical harm to badger and hedgehog which are likely to occur within the application boundary and may use the freshwater ponds for drinking.
- 10.4.19. Both species will therefore need to be considered in legislative and welfare terms, but significant impacts on them or issues with legislative compliance are very unlikely and can be avoided through method statements. There will be on-going legislative protections which must be complied with during construction works.

Construction Phase effects – Dormouse

- 10.4.20. The potential for dormice to be present on Site is low but cannot be discounted. Approximately 1.4 ha of native woodland and scrub will be removed to facilitate the development. This is largely fragmented scrub (1.2 ha) of limited value for the species, with a small area of moderate quality woodland habitat along the stream corridor (0.2 ha). No reduction in habitat connectivity to or from the Site is anticipated given that the existing corridors of woodland, hedgerow and scrub around the Site boundaries will be retained.
- 10.4.21. Removal of woody vegetation during site preparation also carries a risk of killing or injuring individual dormice (if present).

Construction Phase effects – Great Crested Newt

- 10.4.22. The two existing settlement lagoons and surrounding terrestrial habitat will be removed during construction, resulting in direct habitat loss for (what is likely to be a very small population of) great crested newt. Removal of the lagoons and site preparation and construction activity such as vegetation removal, groundworks and movement of heavy plant also carries a risk of killing or injuring individual newts.

Construction Phase effects – Reptiles

10.4.23. Reptiles are likely to occur within the wider land holding and will therefore need to be considered in legislative and welfare terms. However, significant impacts on them or issues with legislative compliance are very unlikely and can be avoided through method statements. There will be on-going legislative protections which must be complied with during construction works.

Construction – Mitigation

10.4.24. Mitigation measures proposed for the construction phase are provided in Table 10-4.

Table 10-4: Construction Phase Mitigation Measures

Feature	Mitigation Proposed	Means of Securing Delivery
Protected Sites	N/a. No construction phase impacts on protected sites are anticipated.	N/a
Ancient Woodland	Detailed CEMP to include standard mitigation measures including damping down and careful positioning of stockpiles (see section 6.4 of the air quality assessment).	Planning Condition requiring CEMP.
Native broadleaved woodland	Approximately 0.2 ha of woodland will be removed to facilitate the development. This will be offset by approximately 4 ha of new native broadleaved woodland planting which has been incorporated into the landscape plan for the site, resulting in an overall gain of 3.8 ha.	Planning Condition requiring Habitat Management Plan (“HMP”)
OMH	<p>The OMH within the site is unexceptional in terms of quality, but site preparation, construction works and new woodland planting required for landscape screening and sediment capture will result in direct loss of approximately 1.5 ha of ephemeral/short perennial and ruderal vegetation, establishing neutral grassland and scattered scrub.</p> <p>During construction, machinery will be used to create areas of disturbance and variation in the topography of the retained OMH resource around the edges of the development. This will encourage flash pooling, early successional plant communities and associated invertebrate species typical of OMH habitats, improving the quality of the existing resource.</p> <p>To ensure no net loss in extent, approximately 2.6 ha of new OMH has been incorporated into the landscape plan. This includes creation of suitable conditions for the re-establishment of OMH following alteration of the landform and new OMH in several locations around the Development.</p>	Planning Condition requiring Habitat Management Plan (“HMP”)

Table 10-4: Construction Phase Mitigation Measures (cont)

Feature	Mitigation Proposed	Means of Securing Delivery
Ponds (settlement lagoons)	<p>The two existing settlement lagoons will be replaced with a single, larger attenuation feature within the site. Whilst this feature will be part of the Sustainable Urban Drainage System (“SUDs”) for the site, opportunities to incorporate biodiversity value are limited within the available space given the storage capacity required.</p> <p>To offset this loss a series of new dedicated wildlife ponds suitable for great crested newts and other species will be created in the south-eastern part of the Site. The ponds will be designed in accordance with Freshwater Habitats Trust Guidelines⁶ and will become valuable habitat as they mature, supporting amphibians, reptiles and invertebrates, as well as providing a water source for mammals.</p> <p>This measure will be in accordance with the recommendations of the Environment Act Wales (2016) and Policy DM2 of the Powys Local Development Plan in delivering biodiversity enhancement, and TAN 5 with regard to priority habitat (creation).</p>	Planning Condition requiring HMP. EPSM licence.
Stream	Detailed CEMP to include a pollution incident response plan, traffic management plan and protocols for adverse weather conditions. See sections 1.4.21 to 1.4.31 of the Water Environment chapter and the Surface Water Management Plan (“SWMP”) in Appendix X/3.	Planning Condition requiring CEMP.
Bats	<p>There will be no external night-time working during the construction phase. External work areas will either not be lit at night or will implement measures such as directional lighting/cowls/louvres to minimise light spill onto adjacent woodland.</p> <p>The oak tree at SJ26941011 will be removed to allow landform change at the edge of the existing quarry void. Whilst no evidence of bats was recorded during the climbed inspections a precautionary approach to removal will be taken (inspection prior to removal). One bat box will be installed on a retained tree outside the construction footprint to compensate for the loss of potential roosting habitat.</p>	Planning Condition requiring CEMP.
Breeding Birds	<p>Any semi-natural vegetation within the Development site footprint that has the potential to support breeding birds will be removed outside the breeding season (the breeding season can be considered to span the period March to August inclusive).</p> <p>If this is not possible, a site check by a professional ecologist to confirm the absence of nesting birds within the development footprint should be undertaken ahead of any habitat clearance work.</p>	Planning Condition requiring method statement in CEMP.

⁶ <https://freshwaterhabitats.org.uk/wp-content/uploads/2013/09/pond-design.pdf>

Table 10-4: Construction Phase Mitigation Measures (cont)

Feature	Mitigation Proposed	Means of Securing Delivery
Badgers / hedgehogs	<p>A site check will be undertaken by an ecologist in advance of re-profiling and clearance works to ensure that there has been no change to the baseline situation (i.e. setts are no closer to the site). If there has been a change in the baseline, appropriate measures to mitigate the likely impact will be defined.</p> <p>Any open excavations / voids within the site will either be covered overnight, or a means of escape provided for badgers, hedgehogs, and other mammals.</p>	Planning Condition requiring method statement in CEMP.
Dormice	<p>The presence of dormice within the site is considered unlikely but cannot be discounted. A precautionary approach to site clearance will therefore be undertaken. Removal of woody habitat will be completed under a method statement to minimise the risk of harm to individual dormice (if present). Measures will include coppicing of woody vegetation in winter when dormice are hibernating at ground level and delay of stump removal until the active season (late spring-autumn).</p> <p>The provision of 4 ha of new native broadleaved woodland planting incorporated into the landscape plan for the site, will resulting in an overall net gain of 2.6 ha. Connectivity will be maintained by retention of existing belts of woody vegetation around the Site boundaries.</p>	Planning Condition requiring method statement in CEMP.
Great crested newts	<p>A European Protected Species Mitigation Licence ('EPSML') and associated method statement will be required for removal of the existing settlement lagoons and surrounding terrestrial habitat. As noted below, the statutory tests under the Habitats Regulations are considered to be met and a EPSML is expected to be granted by NRW.</p> <p>The method statement will set out measures to mitigate the risk of harm to individual newts during construction and operation of the ERF. This is likely to include sensitive timing of work, ecological supervision during pond and terrestrial habitat removal, appropriate fencing to exclude newts from the construction area, creation of new ponds and an appropriate HMP to ensure overall habitat enhancement for newts is achieved.</p>	EPSML, Planning Condition requiring CEMP and HMP.
Reptiles	<p>Vegetation removal will be undertaken following a method statement to reduce the risk of killing or injuring reptiles. This is likely to include similar measures to those set out above for great crested newts and dormice.</p>	Planning Condition requiring CEMP.

Operational Phase effects – Designated Sites and Ancient Woodland

- 10.4.25. Deposition of gaseous emissions from the thermal treatment process has potential to result in habitat degradation within designated and ASNW sites.

- 10.4.26. A shadow Habitat Regulations Assessment (“sHRA”) (BSG Ecology 2020^{xvi}) has been produced which addresses impacts on the Montgomery Canal SAC, Granllyn SAC Midland Meres and Mosses – Phase 1 Ramsar site in further detail. The sHRA will accompany the planning application.
- 10.4.27. An assessment of the effects on all designated sites is set out in Tables 10.9 and 10.10 below.

Operational Phase effects - Habitats

- 10.4.28. Direct loss of habitats will occur during the removal of vegetation from the Development footprint during construction and planting of new woodland for screening purposes, which will be completed following completion of construction activities. No further habitat loss is anticipated during the operational phase.
- 10.4.29. Given the proximity of the stream to the access road, site traffic has potential to result in habitat degradation should oil/fuel spills occur and enter the water environment.

Operational Phase effects – Bats

- 10.4.30. There is potential for site lighting to cause bats to be displaced from foraging and commuting routes, and for light spill onto retained habitats outside the Development site. The most important areas are the woodland edge to the west and hedgerow to the north-east.

Operational Phase effects– Breeding Birds

- 10.4.31. Vegetation removal will be completed during construction which will remove all suitable nesting and foraging habitat for birds within the construction footprint. No further loss of nesting habitat is anticipated during the operational phase.

Operational Phase effects– Badgers and Hedgehogs

- 10.4.32. The two existing settlement lagoons will be removed during the construction phase and replaced with a single, larger attenuation feature and a series of smaller, dedicated wildlife ponds, maintaining the freshwater drinking resource for badger and hedgehog.
- 10.4.33. Vehicle movement along the access road, particularly close to the Site boundaries, carries a risk of killing or injury to individual animals which may cross between areas of retained and newly created habitat.
- 10.4.34. The noise and vibration assessment (see Chapter 14) concluded that operation of the ERF will not result in significant noise or vibration effects on the badger setts.

Operational Phase effects – Dormouse

10.4.35. Removal of woodland and scrub within the construction footprint will be completed during construction. No further habitat loss is anticipated during the operational phase.

Operational Phase effects– Great Crested Newts

10.4.36. Removal of the two existing settlement lagoons and suitable terrestrial habitat will be completed during construction, no further habitat loss is anticipated during the operational phase.

10.4.37. Vehicle movement along the access road, particularly close to the areas of existing woodland and new attenuation pond, carries a risk of killing or injury to individual newts which may cross from the new attenuation pond to the woodland.

Operational Phase effects– Reptiles

10.4.38. Removal of the limited areas of suitable reptile habitat within the construction footprint will be completed during construction. No further habitat loss is anticipated during the operational phase.

Operational Phase Mitigation – All Ecological Features

10.4.39. Mitigation measures proposed for the operational phase are provided in Table 10-5.

Table 10-5: Operational Phase Mitigation Measures

Feature	Mitigation Proposed	Means of Securing Delivery
Designated Sites	None required	N/a
Ancient Woodland	None required	N/a
OMH	A habitat management plan for the new and retained areas of OMH (as shown on Figure BT1180-D15 in Technical Appendix 10.2.) should be implemented for the operational life of the ERF. This will involve relatively small-scale measures such as periodic re-survey potentially leading to scrub removal and localised disturbance of the substrate to encourage the re-establishment of early successional communities. Additionally, areas of OMH should not be cleared, planted with trees or shrubs or used for the lay down of materials or additional parking during the operational phase of the development. These measures will ensure the OMH resource is maintained and enhanced in accordance with national and local planning policy requirements.	Planning Condition

Table10-5: Operational Phase Mitigation Measures (cont)

Feature	Mitigation Proposed	Means of Securing Delivery
Bats	Details of how light levels around the development will be designed to minimise impacts on bats during the operational phase of the Development are set out in the Lighting Plan (see Technical Appendix 4-2). This demonstrates how measures such as selection and shielding of luminaires and use of a motion activated system at sensitive points along the access road will ensure lighting will be directed away from sensitive areas, such that light levels will not exceed 1 lux at woodland edge within the western part of the Development or along the hedgerow to the north east.	Planning Condition requiring implementation of Lighting Plan
Breeding Birds	None required	N/a
Badgers / hedgehogs	Suitable road safety measures e.g. low speed limit should be incorporated into the road design at key points where mammals are likely to cross to minimise the risk of road mortality.	N/a
Dormice	A habitat management plan for the new woodland planting ((as shown on Figure BT1180-D15 in Technical Appendix 10.2.) should be implemented for the operational life of the ERF. This will involve woodland management to establish and maintain high quality habitat for dormice, such as small scale, long rotation coppicing.	Planning Condition
Great crested newts	The EPSML will require a management plan for the ponds and terrestrial habitat for the operational life of the ERF. Suitable road design in the vicinity of the new attenuation feature e.g. low speed limit and wildlife friendly kerbs should be incorporated into the road design within 250 m of the new attenuation feature and wildlife ponds to minimise the risk of road mortality or great crested newts becoming trapped in drainage infrastructure.	Planning Condition & EPSML
Reptiles	None required	N/a

Decommissioning Phase effects– All Ecological Features

- 10.4.40. Decommissioning effects are likely to be limited to impacts on the species and habitats that have become established within and around the plant during its operational life.
- 10.4.41. The level of detailed consideration given to each ecological feature at decommissioning stage is likely to reflect the requirements of legislation and policy at that time. However, it is likely that impacts on OMH, ponds, reptiles, amphibians and invertebrates will need to be considered as a minimum. The requirement to consider the effects of e.g. dust on ancient woodland will need to be determined based on the method of deconstruction proposed, and the potential for significant dust to occur. However, it seems certain that significant effects on ecological features can be largely avoided and / or reduced to a point they will not be significant in EIA terms.

- 10.4.42. Mitigation will need to be informed by a suite of surveys to update the baseline position and inform measures to ensure legislative compliance.

Decommissioning Phase Mitigation – All Ecological Features

- 10.4.43. Measures are likely to be needed to avoid impacts on habitats and species and ensure legislative compliance during the decommissioning phase. The OMH and ponds are likely to be of local or greater conservation importance and will need to be retained. Impacts on protected species (based on current species groups afforded protection) are likely to be limited, and are very unlikely to be significant in EIA terms if appropriate mitigation based on industry standard guidance is implemented for control of dust, impacts on hydrology etc.
- 10.4.44. It is recommended that the production of a decommissioning phase method statement is a condition of planning. This will need to be informed by appropriate survey work covering all species and habitats afforded legal and policy protection that could be significantly impacted by the works.

The Development Overall

- 10.4.45. This section considers the likely impacts of the Development if all construction and operational phase mitigation is adopted.
- 10.4.46. The main impacts of the development are direct loss of priority OMH and pond habitats; degradation of aquatic habitats resulting from pollution; and risk of harm to or displacement of protected species.
- 10.4.47. The proposed creation and enhancement of OMH habitat should be fully effective and result in local conservation gain, as the existing OMH is of low quality. Consideration should be given in the HMP as to how to achieve diversity of substrate (natural and artificial, nutrient rich and nutrient poor, compacted and loose material), the importance of a mosaic of dry and wet ground conditions, topographical variation, and how to maximise structural diversity. The result should be a far more valuable resource for invertebrates and a more diverse plant assemblage than is currently present. Small-scale monitoring will be required to inform any changes to long term management that may be needed. The value of the habitat as OMH should also be periodically reassessed based on invertebrate and botanical survey, to demonstrate the quality of the resource.
- 10.4.48. The landscape proposals include the creation of approximately 4 ha of new native broadleaved woodland. This will fully offset the loss of woodland and scrub habitats and deliver a net gain of 2.6 ha. As the new woodland matures it will provide high quality habitat for a variety of species.
- 10.4.49. The creation of new wildlife ponds will also be fully effective in mitigating the loss of existing waterbodies. The HMP to be secured pursuant to planning condition, will set out detailed design requirements of the ponds relating to depth and structural diversity (predominantly shallow with soft edges), and future maintenance requirements. The new

ponds will be of value to a range of species groups, particularly aquatic invertebrates reliant on water during their life cycle, amphibians including great crested and palmate newts (which have been recorded in pools in the workings), reptiles, birds and mammals (that may use the pond for both foraging and drinking).

- 10.4.50. The overall effect on great crested newts is likely to be beneficial. The existing ponds support a low population and are suboptimal habitat for the species due to heavy shade and/or siltation due to their function as settlement lagoons for the quarry.
- 10.4.51. The creation of new, dedicated ponds and associated terrestrial habitat will result in higher quality habitat for great crested newts (450m² surface area plus new terrestrial habitat). The position of these ponds, towards the south-eastern boundary of the Site has been confirmed in consultation with Border Hardcore, taking both the Development and the wider planning allocation into account to minimise the potential impact of future development.
- 10.4.52. The EPSML and associated method statement required for removal of the lagoons will set out appropriate measures to ensure legislative compliance with respect to great crested newts during construction and operation of the ERF. Favourable conservation status will not be affected at any geographical level. Whilst the tests under the Habitat Regulations directly apply at the licensing stage, the ability for these tests to be satisfied and likelihood of a licence being granted by NRW are also relevant at the planning stage. It is considered that the tests under the Habitat Regulations will be satisfied and would fully expect an EPSML to be granted by NRW.
- 10.4.53. The first test is a planning consideration, and concerns imperative reasons of overriding public interest, including those of a social or economic nature, and beneficial consequences of primary importance to the environment. The Planning Statement that accompanies this application addresses the need for the facility and its compliance with Welsh legislation and policy guidance with regard to these matters.
- 10.4.54. The second test concerns satisfactory alternatives. The function of the two ponds that will be lost is to receive run off from quarrying operations and trap silt. They will become redundant if the scheme is consented. They are situated in the quarry void in an area which makes it unfeasible to retain them within the design. They have only recently become colonised by (one or more) great crested newts (in all likelihood due to temporary relaxation of management by the quarry operator), and their turbidity, steep-sided profiles and limited submergent and emergent vegetation are likely to limit the productivity and size of newt populations. If the ponds are de-silted in winter, in line with their normal management, they will become unfavourable again. The development can deliver a solution in terms of pond creation that is far more favourable for great crested newts.
- 10.4.55. The third test concerns ensuring the proposals will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range. The population is currently very small. This assessment is based on the maximum count of one animal using the ponds gained through torching, two previous negative eDNA results (including one in 2018) suggesting recent colonisation, and their general suitability / capacity to support animals. The proposed new newt ponds, which will be subject to a management plan and monitoring (as a

condition of the licence), will considerably enhance the potential of the site to support GCN in the medium and long term, and will increase the resilience of the species to decline / extinction at the local level.

- 10.4.56. Dormice are considered unlikely to be present in the Development Area given the low quality of most of the habitat within the Site and the lack of local records. However, the species may be present in suitable habitats locally and their presence cannot be discounted. However, given that the area of suitable habitat to be affected is limited (0.2 ha) and the remainder is both fragmented and poorly connected to the wider landscape, the risk of encountering dormice during site clearance is low.
- 10.4.57. Reasonable avoidance measures incorporated into the CEMP will minimise the risk of harm to individual animals (if present) and is considered proportionate to the level of risk associated with site clearance. In addition, the proposed 4 ha of new native woodland planting will result in an overall gain in habitat quantity and quality for dormice and habitat connectivity will be maintained. On this basis the proposals will not be detrimental to the maintenance of the favourable conservation status of dormice in their natural range.
- 10.4.58. The effect on the bat assemblage of the area is likely to be neutral. Key areas of habitat all lie outside the footprint of the development. The lighting strategy covering both the construction and operational phases of development will ensure that there is no significant light spill onto these habitats. Favourable conservation status will not be affected at any geographical level.
- 10.4.59. The construction phase control measures proposed are likely to fully address potential issues of legislative compliance regarding breeding birds, badgers, and reptiles, and to ensure the local conservation status of hedgehog is not affected by the proposals. Habitat creation associated with the development is also likely to benefit these species / species groups.

The Development in Combination with Other Developments

- 10.4.60. Development in the wider area that could result in similar impacts, and act in combination with the proposals to result in a cumulative significant impact on protected sites, species or habitats is extremely limited. A new school has been consented at Salop Road on the eastern side of Welshpool; the main ecological issues were construction phase impacts on the Montgomeryshire Canal SAC and SSSI (which it was accepted by nature conservation stakeholders could be readily controlled through measures identified in a CEMP), and legislative compliance with regard to breeding birds and dormouse during construction.
- 10.4.61. Other local projects include small-scale residential developments (typically of less than 30 units), domestic extensions and changes of use, and agricultural diversification / change of use projects.
- 10.4.62. Impacts on designated sites have not been an issue for these developments. Impacts on protected species and habitats typically refer to legislative compliance, with solutions identified on a project-by-project basis.

- 10.4.63. The air quality assessment includes an in-combination air quality assessment of the ERF and an Intensive Livestock Unit (ILU) (planning reference P/2018/0474).
- 10.4.64. The results of the assessment are limited by the data available, but interrogation of the isopleths presented in the AS Modelling and Data Limited Report indicate that Moel Y Golfa is beyond the lowest contour (0.01µg/m³ or 1% of the Critical Level of 1µg/m³). This has led to the conclusion that Process Contributions (PCs) from the ILU are not significant.
- 10.4.65. The air quality assessment notes that the process contribution from the ERF is 0.0151µg/m³, or 1.51% of the Critical Level (1µg/m³). Whilst this is above 1% of the Critical Level (and therefore cannot be screened out as insignificant), it represents a very small increase. Furthermore, the assessment is noted as being precautionary as the modelling assumes that the ERF is operating 24 hours a day, 7 days a week and emitting ammonia at a concentration of 10mg/Nm³. Evidence from a comparable, operational site is used to demonstrate why this should be viewed as a precautionary estimate (emission concentrations for ammonia obtained in September 2019, and January 2020 were 0.50mg/Nm³ and 0.35mg/Nm³ respectively, twenty times lower than the value used in the modelling study) and that the actual process contribution is likely to fall below the 1% threshold.
- 10.4.66. Given the above it is considered very unlikely that a significant in combination impact on any ecological feature will occur.

Interactive Effects

- 10.4.67. Consideration must be given to the interactive effects associated with the Development in terms of the relationship between the various Key Environmental Aspects (KEAs) considered. Likely interactive effects are discussed in Table 10-6.

Table 10-6: Interactive Effects on Ecology

KEA Interaction	Interactive Effects
Ecology and Air Quality	<p>During the construction phase dust will be generated which may impact on habitats and designated sites within the zone of influence. The impact of dust on ecological features has been considered in Chapter 6 in Section 6.4.</p> <p>During the operation phase emissions from the stack may impact on designated ecological sites and habitats within the zone of influence. This impact has been assessed in tables 10-9 & 10-10</p>
Ecology and hydrology	<p>During the construction phase run off containing suspended solids and potentially other pollutants arising from use of plant and site traffic will be generated which may impact on habitats connected with the local water environment. This impact has been assessed in tables 10-9 & 10-10</p>

Table 10-7: Interactive Effects on Ecology

KEA Interaction	Interactive Effects
Ecology and landscape	The site landscape strategy has been designed to avoid areas of existing priority habitat (particularly OMH) as far as possible, whilst delivering the appropriate visual screening and sediment capture functions. The impact of landform modification and new planting on OMH during construction has been considered in this Chapter 10
Ecology and lighting	The site lighting strategy has been designed to avoid light spill on new and retained habitats whilst complying with safety requirements. The impact of lighting on bats has been considered in this Chapter and assessed in tables 10-9 & 10-10
Ecology and noise	The noise mitigation strategy includes application of best practice in accordance with BS5228 and choice of piling to reduce noise and vibration effects. The impact of noise and vibration on badger has been considered in this Chapter. This impact has been assessed in tables 10-9 & 10-10.

10.5. Environmental Effects Analysis

- 10.5.1. Potentially significant effects on ecological features resulting from the construction, operation and decommissioning of the proposed development are considered in this section. Effects of the development alone and in combination with other proposals are assessed.
- 10.5.2. While industry standard CIEEM (2018) guidance requires ecologists to use their knowledge and experience to undertake assessments (and does not support a matrix-based approach to assessment), it does provide an indication on the factors (criteria) considered in the process of determining significance of impacts.
- 10.5.3. For consistency with other sections of this Environmental Statement, these, along with a description of what they refer to, are set out in Table 10-7 below.

Table 10-8: Environmental Effects Assessment Evaluation Criteria

Criteria & description	Impact descriptor
<p>Magnitude of Impact (Mg)</p> <p>Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.</p>	<ul style="list-style-type: none"> • High (H) – major loss or alteration such that the post development character/composition/attributes of the receptor will be fundamentally changed. • Medium (M) – loss or alteration such that the post development character/composition/attributes of the receptor will be partially changed. • Low (L) – minor shift away from baseline conditions. Loss/alteration will be discernible, but post development character/composition/attributes of receptor will be similar to the baseline. • Negligible (Neg) – very slight change from baseline conditions. Change barely distinguishable, approximating the ‘no change’ condition. • Nil – no anticipated changes from baseline
<p>Geographic Extent of Impact (GE)</p> <p>The extent is the spatial or geographical area over which the impact/effect may occur under a suitably representative range of conditions.</p>	<ul style="list-style-type: none"> • Within ERF Boundary – 0km • Up to 2km from ERF • Up to 10km from ERF • Over 10km from ERF
<p>Frequency of Impact (F)</p> <p>The number of times an activity occurs will influence the resulting effect. The timing of an activity or change may also result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.</p>	<ul style="list-style-type: none"> • Single event (S) • Annual activity (A) • Monthly occurrence (M) • Continuous activity (C) • Unknown (U)
<p>Duration of Impact (D)</p> <p>The duration and timing of an activity in relation to the lifecycles of species or communities will influence effects. Resulting impacts and effects may be described as short, medium or long-term and permanent or temporary. These need to be defined in months/years.⁷</p>	<ul style="list-style-type: none"> • Short-term (days or weeks) (ST) • Medium (36 month construction period) (36m) • Long-term (years) (Y) • Permanent (P) • Unknown (U)

⁷ For further clarity, the Duration of Impact for this chapter is considered differently to the other chapters. All other chapters consider the duration of the activity that causes the impact, not the duration of the impact. However, CIEEM guidance requires assessment of the duration of the effect/impact on the feature that results from the activity, not the duration of the activity is what is important in assessing impacts effects. E.g. If an activity results in the desertion of a bat maternity roost / the failure of bats to breed successfully, the effect on the population will outlast the duration of the activity that caused it. If an animal or animals are killed as a result of an activity it is the effect on the population and the duration of its recovery that is important.

Table10-7: Environmental Effects Assessment Evaluation Criteria (cont)

Criteria & description	Impact descriptor
<p>Reversibility of Impact (R)</p> <p>An irreversible effect is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation. In some cases, the same activity can cause both reversible and irreversible effects.</p>	<ul style="list-style-type: none"> • Reversible (R) • Irreversible (I)
<p>Ecological, Cultural and Socio-economic Context of Impact (ESC)</p>	<ul style="list-style-type: none"> • Relatively pristine area not adversely affected by human activity (P) • Evidence of human activity (E) • High level of human activity (H)

- 10.5.4. Significant effects are qualified with reference to an appropriate geographic scale. The scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important (i.e. because it may only affect that feature in part).
- 10.5.5. The CIEEM guidance encourages the expression of the severity of ecological effects with reference to a geographic frame of reference. The following frame of reference has been used in this case:
- International (European).
 - United Kingdom.
 - Wales.
 - County (Powys).
 - Local (Montgomeryshire).
 - Site (the Development site and adjacent areas).
- 10.5.6. However, other disciplines within this Environmental Statement use a relative scale of severity with categories based on; Major (Substantial/Severe), Moderate, Minor (Slight) or Negligible.
- 10.5.7. Table 10-8 provides a means of relating the geographic scale of impact to the four standard categories of severity and is provided in order to allow the ecological impact assessment to be integrated into the wider EIA without compromising the CIEEM approach (CIEEM, 2018).

Table 10-9: Relationship between ecological impact assessment and wider EIA assessment of significance (based on Box et al., 2017).

Geographic scale of impact (as per CIEEM 2016 guidance)	Severity
International, European, national, or regional	Major
Regional, metropolitan, county, vice-county or other local authority-wide area.	Moderate
Local	Minor
Site or below	Negligible

10.5.8. Once the geographic scale and severity of the effect has been assessed, professional judgement is then used to assess the significance of that effect, considering factors such as the likelihood of affecting the distribution, abundance (and ultimately the conservation status) of protected species, or affecting the connectivity or quality of protected habitats, or of breaches in wildlife legislation or contravention of planning policy.

10.5.9. A detailed environmental effects analysis of the construction, operational and decommissioning phase is provided in Table 10-9.

Table 10-10: Environmental Effects Analysis – Construction

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Site construction and enabling works	Impacts on statutory protected sites (direct habitat loss or degradation through air pollution).	Nil	0km	C	36m	R	H
	Conclusion: No direct or indirect impacts anticipated given the physical distance (≥ 1.8 km) between the Development and designated sites. Not Significant.						
	Mitigation: None required.						
	Dust deposition on PAWS and restored ancient woodland	Neg	0km	C	36m	R	H
	Conclusion: Impacts arising from dust and vehicle/plant emissions anticipated to be restricted to within 100 m of the construction area. This includes a small area (0.05 ha) of PAWS directly adjacent to the Site. Not Significant.						
	Mitigation Standard air quality measures to be included in detailed CEMP.						

Table10-9: Environmental Effects Analysis – Construction

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Vegetation removal, groundworks and new woodland planting	Loss of Open Mosaic Habitat on previously developed land.	M	0km	S	P	R	H
	<p>Conclusion: Whist the example of this habitat on Site qualifies as a priority (Section 7) habitat, is not notable in terms of its species composition / quality, and is relatively homogenous, reflecting compaction and a lack of variety in topography across much of the area in which it occurs.</p> <p>Adverse impact at the Local scale. Not Significant</p>						
	<p>Mitigation: Enhancement of retained OMH and re-establishment/creation of approximately 2.6 ha of new, higher quality OMH. Long term management of retained and created habitats in accordance with an HMP.</p>						
Vegetation removal and groundworks	Loss of native woodland	M	0km	S	P	R	H
	<p>Conclusion: Whist native woodland is a priority (Section 7) habitat, the area to be lost is relatively limited and generally species poor (0.2 ha).</p> <p>Adverse impact at the Site scale. Not Significant</p>						
	<p>Mitigation: Provision of 4 ha of new broadleaved woodland planting. Long term management of retained and created habitats in accordance with an HMP.</p>						
Vegetation removal and groundworks	Loss of existing settlement lagoons	H	0km	S	P	R	H
	<p>Conclusion: The lagoons meet the criteria for a priority (Section 7) habitat (ponds) due to the presence of great crested newt only and are otherwise unremarkable, being heavily silted and/or shaded. They support some native plant species, a population of palmate newts, and provide a year-round drinking opportunity for mammals and birds.</p> <p>Loss of the lagoons would be an adverse impact at the Development site scale. Not Significant</p>						
	<p>Mitigation: Creation of a series of high quality, dedicated wildlife ponds around the periphery of the Site (designed to Freshwater Habitats Trust guidance). The ponds will be suitable for great crested newts and other wildlife to offset the loss and provide valuable habitat for amphibians, reptiles and invertebrates, and a water source for mammals and birds.</p>						

Table 10-9: Environmental Effects Analysis – Construction (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Ground works and movement of vehicles and heavy plant	Degradation of aquatic habitat through run-off/pollution events.	M	<2 km	C	36m	R	E
	Conclusion: Potential for damage/degradation to an LBAP habitat resulting from adjacent road construction and pollution events associated with reprofiling and plant/vehicle movement. Adverse impact at the Local scale. Not Significant						
	Mitigation: Detailed CEMP to include a pollution incident response plan, traffic management plan and protocols for adverse weather conditions. Temporary fencing installed along the banks of the sections of open watercourse.						
External lighting overnight	Displacement of bats due to lighting.	M	0km	C ¹	36m	R	H
	Note 1: activity is only continuous at night during active season						
	Conclusion: Light spill onto habitats directly adjacent to and outside the Development site used for foraging and commuting by bats (particularly woodland edge) may result in displacement of light sensitive species compounded by impacts on food availability (as invertebrates are drawn to lights). Adverse impact at the Local scale. Not Significant						
	Mitigation: Avoidance of night working during the active season.						
Felling of single oak tree of moderate roost potential	Killing/injury of bats. Loss of roosting resource.	H	0km	S	P	I	H
	Conclusion: No evidence of roosting bats was recorded from the oak at SJ26941011. However, bats move between tree roosts frequently and removal of the tree presents a risk of harm to individual bats should they be present during felling. Removal of potential roost features on the tree will also result in a reduction in the available roosting resource for bats using the Site. Adverse impact at the site scale. Not Significant						
	Mitigation: Climbed inspection of potential roost features immediately prior to felling to ensure no bats are present. Installation of one bat box on a retained tree to offset loss of potential roosting features.						
Vegetation removal	Loss of active nests of breeding birds	Neg	0km	S	P	I	H
	Conclusion: Removal of woodland and scrub may affect low numbers of nests if present. Negligible impact at any scale – legislative consideration only. Not Significant.						
	Mitigation: Woodland and scrub removal within the development footprint to be undertaken in winter. If not possible, ecologist to search area prior to clearance and put in place mitigation as required.						

Table 10-9: Environmental Effects Analysis – Construction (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Vegetation removal and groundworks Storage of equipment on site overnight.	Killing and injury of badgers and hedgehog. Loss of drinking areas (ponds) that support populations.	Neg	Okm	S	P	I	H
	<p>Conclusion: Any deep excavations left open overnight present a hazard to badgers and hedgehogs which may fall in while foraging/moving across the site. There is also some potential for injury on equipment such as wire or chemicals left in areas accessible to these species overnight. Removal of the existing settlement lagoons will result in a loss of drinking resource within the Site.</p> <p>The noise and vibration assessment (Chapter 14) concludes that there will be no significant noise or vibration effects on the existing badger setts during construction.</p> <p>Negligible impact at any scale – legislative and welfare consideration only. Not significant.</p>						
	<p>Mitigation Walkover survey to determine any new badger activity and appropriate mitigation (if any) to be undertaken prior to site clearance. All deep excavations to be covered overnight or provided with a means of escape (such as a plank leant against the side). Any equipment with potential for injury to be stored in a locked unit overnight.</p>						
Removal of woodland and scrub	Killing and injury of dormice. Loss of habitat which may support dormice (if present).	H	Okm	S	P	I	H
	<p>Conclusion: Dormice are unlikely to be present in the majority of woody habitat within the Development Area but their presence cannot be discounted. Removal of woody habitat carries a risk of killing/injury to individual dormice (if present) and represents direct loss of low (1.2 ha) and moderate (0.2 ha) quality habitat.</p> <p>Adverse impact at the site scale. Not Significant</p>						
	<p>Mitigation Working method statement to minimise potential for killing and injury. Measure likely to include sensitively timed two-stage removal of woody habitat. Any populations present are likely to benefit from creation of extensive new woodland planting and long-term management under the HMP, resulting in an increase in both quality and quantity of available habitat.</p>						

Table 10-9: Environmental Effects Analysis – Construction (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Removal of lagoons, vegetation clearance, ground works and movement of vehicles and heavy plant	Killing and injury of great crested newt. Direct habitat loss.	H	0km	S	P	I	H
	<p>Conclusion: Vegetation clearance, removal of the existing lagoons and groundworks has potential to kill/injure small numbers of great crested newts and will result in direct habitat loss.</p> <p>Adverse impact at the site scale. Not Significant</p>						
	<p>Mitigation EPSML setting out measures to mitigate the risk of harm to individual newts during construction. This is likely to include sensitive timing of work, ecological supervision during pond and terrestrial habitat removal, appropriate fencing to exclude newts from the construction area, creation of new ponds and an appropriate HMP to ensure overall habitat enhancement for newts is achieved.</p>						
Removal of lagoons, vegetation clearance, ground works and movement of vehicles and heavy plant	Killing and injury of reptiles	L	0km	S	P	I	H
	<p>Conclusion: Vegetation removal and groundworks has potential to kill/injure reptiles if present. However, as suitable habitat is limited to small areas at the periphery of the Development footprint and consists of low-growing, open vegetation the risk of encountering reptiles during site preparation and construction is low.</p> <p>Negligible impact at any scale – legislative and welfare consideration only. I.e., there will be on-going legislative protections which must be complied with during construction works.</p> <p>Not Significant.</p>						
	<p>Mitigation Working method statement to minimise potential for killing and injury (likely to be similar measures to those for GCN). Any populations present likely to benefit from creation of quality OMH and new ponds.</p>						

Table 10-11: Environmental Effects Analysis – Operation

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Operation of the ERF and associated vehicle movement.	Habitat degradation within designated sites & ASNW/PAWS resulting from air pollution.	Neg	<10 km	C	Y	R	P
	Conclusion: The air quality modelling undertaken by EDL assessment considers the impacts of aerial deposition of maximum predicted nutrient nitrogen deposition rates on designated sites (The maximum ground level concentrations of oxides of nitrogen (“NO _x ”), sulphur dioxide (“SO ₂ ”), ammonia (“NH ₃ ”) and hydrogen fluoride (“HF”) were compared with the critical levels set for the protection of sensitive habitats and found to be not significant).						
	The predicted nutrient nitrogen deposition rates resulting from the Process Contribution (“PC”) of the ERF on the upper critical load of all designated and ASNW sites is <1% for all designated sites and all but one ASNW site (for which the PC is 1.39%). However, as baseline air quality levels for all sites are elevated in the absence of the Development, with this being attributed to agricultural sources, road traffic, shipping, European sources and industrial sources, the Development is not considered likely to have a significant effect on the qualifying features of any designated site or area of ancient woodland (Source attribution data (http://www.apis.ac.uk/ , accessed 22 May 2020)).						
	Negligible impact at any scale. Not Significant						
	Mitigation: None required over and above that integrated into the ERF design.						
Vehicle Movement	Degradation of aquatic habitat through run-off/pollution events.	M	<2 km	C	Y	R	E
	Conclusion: Potential for degradation of an LBAP habitat resulting from pollution events and mobilisation of suspended solids from reprofiled quarry walls.						
	Adverse impact at the Local scale. Not Significant						
	Mitigation: A SWMP has been prepared to address the management of surface water runoff throughout the life of the development.						
Natural Successional Process (no specific activity)	Establishment of habitats created and enhanced during construction	M	0km	C	Y	R	E
	Conclusion Habitats will mature over the operational life of the ERF and be subject to occasional management under a HMP, improving the overall value of the Site for biodiversity.						
	Beneficial impact at the Site scale. Not Significant						
	Mitigation None required.						

Table10-10: Environmental Effects Analysis – Operation (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Site lighting	Displacement of bats due to lighting. Impacts on food availability (as invertebrates drawn to lights)	M	0km	C ¹	Y	R	H
	Note 1: activity is only continuous at night during active season						
	Conclusion Light spill onto habitats directly adjacent to and outside the Development used for foraging and commuting by bats (particularly woodland edge) may result in displacement of light sensitive species and impact on food availability (as invertebrates drawn to lights).						
	Adverse impact at the Local scale. Not Significant						
Vehicle movement	Mitigation Bespoke lighting scheme to maintain <1 lux spill on retained habitats including motion activated lighting along access road at key points with highest bat activity recorded (woodland edge).						
	Road mortality of badger/hedgehog.	M	0km	S	P	I	H
	Conclusion: Use of access roads at night carries a risk of road mortality for badger and hedgehog, although this is a low risk likely to be limited to areas where roads are directly adjacent to retained and newly created habitat at the Site boundaries. The noise and vibration assessment (Chapter 14) concludes that there will be no significant noise or vibration effects on the existing badger setts during operation.						
	Negligible impact at any scale – legislative and welfare consideration only. Not significant.						
Vehicle movement	Mitigation: Implement low speed limit at night.						
	Road mortality of great crested newt	M	0km	S	P	I	H
	Conclusion: Vehicle movement along the access road at night, particularly close to the new attenuation feature, carries a risk of killing or injury to individual newts which may cross to and from the woodland. Gully pots also carry a risk of harm to great crested newts which may fall in and become trapped.						
	Adverse impact at the Site scale. Not Significant.						
Vehicle movement	Mitigation: Suitable road design in the vicinity of the new attenuation feature e.g. low speed limit at night and installation of wildlife friendly kerbs ⁸ within 250 m of the new attenuation feature and wildlife ponds to minimise the risk of road mortality or great crested newts becoming trapped in drainage infrastructure.						

⁸ <https://www.hy-tex.co.uk/product/aco-wildlife/> or similar.

Table10-10: Environmental Effects Analysis – Operation (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Natural Successional Process (no specific activity)	Other ecological features (birds, reptiles etc.)	L	Okm	C	Y	R	H
	<p>Conclusion: Habitats created during construction including high quality OMH, ponds and woodland (required for visual screening) will mature over operational life, improving the value of the Site for a variety of species over the operational life of the ERF.</p> <p>Beneficial impact at the Site scale. Not Significant.</p> <p>Mitigation: None required.</p>						

Table 10-12: Environmental Effects Analysis – Decommissioning

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Site Decommissioning	All features	U	Okm	U	U	R	H
	<p>Conclusion: Measures are likely to be needed to avoid impacts on habitats and species and ensure legislative compliance during the decommissioning phase. The OMH and ponds are likely to be of local or greater conservation importance and will need to be considered. Impacts on protected species (based on current species groups afforded protection) are likely to be limited.</p> <p>Effects on features likely to be avoided / or reduced to a point where they are Not Significant beyond the site level through retention of key habitats and standard control measures to avoid impacts on protected species.</p>						
	<p>Mitigation: It is recommended that the production of a decommissioning phase method statement is a condition of planning. This will need to be informed by appropriate survey work covering all species and habitats afforded legal and policy protection that could be significantly impacted by the works.</p>						

Table 10-13: Environmental Effects Analysis – In-combination

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
	Cumulative loss or degradation of local habitat resource leading to overall species population declines.	Neg	<2km	S	Y	R	E
	<p>Conclusion: Impacts on designated sites have not been an issue for these developments. Impacts on protected species and habitats typically refer to legislative compliance during demolition, renovation or construction, and are small-scale, with solutions identified on a project-by-project basis.</p>						
Permitted or Proposed Development in the Area	<p>The in-combination assessment of ammonia levels of the ERF and ILU on Moel-y-Golfa SSSI concluded that whilst the process contribution from the ERF is 0.0151µg/m³, or 1.51% of the Critical Level (1µg/m³) it represents a very small increase. Furthermore, the air quality assessment is precautionary as the modelling assumes that the ERF is operating 24 hours a day, 7 days a week and emitting ammonia at the ELV concentration of 10mg/Nm³. However, evidence from a similar facility demonstrates that the actual emission concentrations for ammonia were twenty times lower and on this basis the actual process contribution at Moel Y Golfa is likely to fall below the 1% threshold (0.000754µg/m³ or 0.075% of the Critical Level), and therefore is not significant. It follows that it is very unlikely that a significant in combination impact on any ecological feature will occur.</p> <p>Mitigation: No additional mitigation required.</p>						

10.6. Residual Environmental Effects

- 10.6.1. This section considers the residuals environmental effect of the Project, i.e. those effects which remain after the application of mitigation.
- 10.6.2. Residual adverse environmental effects for the Project are summarised in Table 10-13. Both the CIEEM geographic scale of effects and the equivalent EIA-based severity (as set out in Table 10-8) is provided for clarity and coherency with other sections of this document.
- 10.6.3. The proposed mitigation accords with the Environment Wales Act (2016), in which Welsh Ministers are encouraged to maintain and enhance priority species and habitats, and to encourage others to do the same. The OMH and pond have the potential to become habitats of principal importance for the conservation of biodiversity in Wales (Section 7 habitats) as they develop. Policy DM2 of the Powys Local Development Plan encourages proposals to demonstrate how they protect, positively manage and enhance biodiversity including improving the resilience of biodiversity; these measures are coherent with DM2. The project is therefore considered to deliver the biodiversity enhancement

required under Welsh legislation and planning policy at both the national and regional levels.

Table 10-14: Summary of Residual Adverse Environmental Effects

Development Phase	Residual Adverse Environmental Effect	Significance	Likely Effect on the Environment
Construction	Habitat degradation within designated sites & ASNW/PAWS resulting from dust and vehicle/plant emissions.	Negligible Not Significant	None anticipated.
	Habitat loss (OMH, woodland & settlement lagoons)	Adverse Site/Minor Not significant	Temporary loss of habitats will be fully mitigated through creation of new, high quality habitats and enhancement of retained OMH resulting in an improvement on baseline conditions once established.
	Degradation of stream through pollution/direct habitat damage.	Negligible Not significant	Pollution risk will be fully mitigated by implementation of the CEMP and SWMP.
	Displacement of bats through site lighting	Negligible Not significant	None anticipated. No night working avoids impact.
	Killing/injury of bats and loss of roosting resource through felling of moderate potential oak tree	Negligible Not significant	Climbed inspection prior to felling will detect any bats present and allow for retention of tree until EPSML can be obtained. Installation of bat box will maintain baseline roosting resource.
	Killing/injury of GCN	Negligible Not significant	Implementation of EPSML method statement will minimise risk of harm to individual newts.
	Killing/injury of dormice	Negligible Not significant	Implementation of non-licensed method statement within CEMP will minimise risk of harm to individual dormice (if present).
	Killing/injury of Other species (birds/badger/hedgehog/reptiles)	Negligible Not significant	Measures within CEMP will minimise risk of harm to individual animals.

Table 10-1315: Summary of Residual Adverse Environmental Effects (cont)

Development Phase	Residual Adverse Environmental Effect	Significance	Likely Effect on the Environment
Operation	Habitat degradation within designated sites & ASNW/PAWS resulting from air pollution.	Negligible Not Significant	None anticipated.
	Degradation of Stream habitat through pollution events/run off	Negligible Not significant	Pollution risk will be fully mitigated by implementation of the SWMP.
	Displacement of bats through site lighting	Negligible Not significant	None anticipated. Lighting strategy will maintain <1lux at key foraging and commuting areas.
	Road mortality of GCN and other wildlife	Negligible Not significant	Risk will be minimised by implementation of low site speed limit at night and installation of wildlife kerbs ⁹ within 250m of the new attenuation feature and wildlife ponds.
Decommissioning	Impacts on various habitats and species, particularly ponds, OMH and GCN.	Negligible Not significant	Risk will be minimised by a decommissioning phase method statement informed by appropriate survey work.

10.7. Summary

- 10.7.1. Ecological features and the likely effects of the Development on them have been evaluated and assessed in line with current best practice guidance for ecology.
- 10.7.2. Several designated conservation sites are within the Zone of Influence (“ZOI”). These are Montgomery Canal Special Area of Conservation (“SAC”) and Site of Special Scientific Interest (“SSSI”), Granllyn SAC, Moel-y-Golfa SSSI and Midland Meres and Mosses (Phase 1) Ramsar Site. Eleven areas of Ancient Semi-Natural Woodland (“ASNW”) also occur within the ZOI. The ecological sites to be considered in the air quality assessment were all agreed in advance with PINS via the Scoping Request
- 10.7.3. A shadow Habitats Regulations Assessment (“sHRA”) has been prepared which addresses impacts of the Development on the SACs and Ramsar. This along with the air quality chapter concluded that there will be no significant impacts on European designated sites.
- 10.7.4. Air quality modelling undertaken by ECL shows that operation of the ERF will result in a slight increase in air pollution levels but can be considered not significant at all ecological receptors. There will be no exceedances of the critical levels set for the protection of ecosystems at either European Protected sites or all other ecological sites. In most cases, long term process contributions (“PCs”) are less than 1% of the critical level and only just over a maximum of 2.66% for one ancient woodland site.

⁹ ACO wildlife kerb (<https://www.hy-tex.co.uk/product/aco-wildlife/>) or similar product.

- 10.7.5. Nutrient nitrogen deposition critical loads will not be exceeded at the that majority of local nature sites and will not cause any significant pollution at one of the ancient woodland sites. Process Contributions are a maximum of 2.78% of the lower critical load and 1.39% of the upper. At Moel-y-Golfa and the Montgomery Canal, the PCs are a maximum of 2.96% of the lower critical load. However, the magnitude of change for Moel-y-Golfa is so small with respect to the background levels that significant impacts are not expected. Baseline air quality levels for all sites are elevated in the absence of the Development, with this being attributed to agricultural sources, road traffic, shipping, European sources and industrial sources; the Development is not considered likely to have a significant effect on the qualifying features of any SSSI or area of ancient woodland. For the Montgomery Canal, the lower critical load specified is not applicable, and as the process contribution is less than 1% of the upper critical load the impact can be considered not significant. Process Contributions on both RAMSAR sites considered are less than 1% consequently are not significant.
- 10.7.6. For acid deposition, the process contributions are all less than 100% at the local nature sites (a maximum of 3.98%), and less than 1% at the SSSIs, SACs and RAMSAR sites which are relevant for acid deposition.
- 10.7.7. Most of the Development footprint is of low ecological value with limited scope to support protected species. This comprises the existing quarry void, access tracks and laydown areas which are dominated by compacted bare or sparsely vegetated ground, along with recently felled woodland at the proposed new access off the A458.
- 10.7.8. The remainder includes ephemeral/short perennial and tall ruderal vegetation, scattered scrub and areas of semi-improved neutral grassland which together meet the criteria for Open Mosaic Habitat on previously developed land (“OMH”), a Section 7 priority habitat. Two existing settlement lagoons also represent priority habitat (ponds) due to the presence of a small population of great crested newt (“GCN”). Broadleaved woodland along the stream corridor is also a Section 7 priority habitat.
- 10.7.9. Habitats immediately adjacent to, but outside the Development footprint include a small stream, broadleaved and coniferous woodland, including an area of Plantation on an Ancient Woodland Site (“PAWS”). Habitats associated with the remnant agricultural field system are also present within the wider land holding, including hedgerow, scrub, and scattered trees, poor semi-improved and neutral grassland, and tall ruderal vegetation.
- 10.7.10. Targeted ecological surveys have identified that habitats within the Development area and within the wider land holding support or have the potential to support, fauna that could be affected by the proposals. These include GCN, bats, nesting birds, dormice, badger, hedgehog, reptiles, and common amphibians.
- 10.7.11. The main impacts of the development are direct loss of priority (but relatively low quality) OMH, woodland and pond habitats; degradation of aquatic habitats resulting from pollution; and risk of harm to or displacement of protected species.
- 10.7.12. A range of mitigation and enhancement measures have been designed into the development proposals. These include the creation of approximately 2.6 ha of new, high quality OMH habitat along with a series of dedicated wildlife ponds and 4 ha of new

native woodland planting which will ensure no net loss of habitats and an overall increase in habitat quality once established.

- 10.7.13. A habitat management plan will identify long-term management and monitoring provision for the mitigation, compensation and enhancement measures outlined in this chapter and shown on Figure BT1180-D15 in Technical Appendix 10.2. The plan will be in accordance with BS 42020 and will cover the lifetime of the development.
- 10.7.14. Precautionary measures in respect of the protection of habitats and species will be incorporated into a CEMP to ensure minimisation of effects during construction and operation. A European Protected Species Mitigation Licence (“EPSML”) will be secured to ensure legal compliance with respect to GCN.
- 10.7.15. The measures proposed will minimise the effects of the Development on ecological features of importance and ensure legal compliance in respect of protected species. The development is consistent with relevant biodiversity planning policy and is considered to contribute to the aims of the Environment (Wales) Act in maintaining and enhancing biodiversity and promoting the resilience of ecosystems, particularly OMH and ponds. Local habitat connectivity will be maintained and there will be an overall increase in the quality of priority habitats.

10.8. References

General Overarching Guidance

- CIEEM. (2018). Guidelines for ecological impact assessment in the UK and Ireland: third edition. CIEEM, Winchester.
- CIEEM. (2016). Guidelines for ecological impact assessment in the UK and Ireland: second edition. CIEEM, Winchester.
- Collins, J [Ed]. (2016). Bat surveys for professional ecologists: good practice guidelines. Bat Conservation Trust, London.
- Freshwater Habitats Trust. (2015). Guidance on eDNA survey. Published online at: <https://freshwaterhabitats.org.uk/wp-content/uploads/2015/03/eDNA-method-protocol.pdf>
- Green, J. (2002). Birds in Wales 1992-2000. Welsh Ornithological Society, Cardigan,
- Maddock, A [Ed]. (2008). UK Biodiversity Action Plan; Priority Habitat Descriptions. JNCC, London.

Specific References

- i Environment (Wales) Act 2016
- ii The Conservation of Habitats and Species Regulations
- iii The Wildlife & Countryside Act 1981 (as amended)
- iv Protection of Badgers Act 1992
- v Planning Policy Wales
- vi Technical advice note (TAN) 5: nature conservation and planning
- vii Powys Local Development Plan 2018
- viii Powys Supplementary Planning Guidance on biodiversity
- ix www.magic.gov.uk [accessed May 2018].
- x www.bing.com/maps [accessed May 2018].

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- ^{xi} SLR 2015
- ^{xii} SLR Consulting. (2017). Buttington ERF plant ecology chapter. SLR Consulting, Shrewsbury.
- ^{xiii} Phase 1 handbook
- ^{xiv} Institute of Environmental Assessment. (1995). Guidelines for Baseline Ecological Assessment. E & FN Spon, London.
- ^{xiv} <http://lle.gov.wales/catalogue?C=2004&lang=en>
- ^{xiv} BSG Ecology. (2018). Shadow Habitats Regulations Assessment report. Report to Broad Energy, Shrewsbury.

Technical Appendix 10-1 Legislation

Buttington ERF

Technical Appendix 10.1:
Legislation

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Contents

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1 Key policy and wildlife statute

This Technical Appendix briefly summarises the legislation, policy and related issues that are relevant to the main text of the Biodiversity ES chapter. The following text does not constitute legal or planning advice.

Planning Policy Wales 10

1.1 PPW 10 seeks to sustain and create places in which...

- the role which landscapes, the historic environment, habitats and biodiversity, the characteristics of coastal, rural or urban environments play in contributing to Distinctive and Natural places are identified, understood, valued, protected and enhanced;
- further fragmentation of habitats is avoided, wherever possible, and green networks, corridors and connecting habitat within developed areas is protected, and enhanced;
- sites designated for their landscape or nature conservation importance are fully considered and their special characteristics and features protected and enhanced, whilst the network of sites should be recognised as being at the heart of improving the resilience of ecosystems;

1.2 Paragraph 6.4.4 states that

“It is important that biodiversity and resilience considerations are taken into account at an early stage in both development plan preparation and when proposing or considering development proposals. [.....] All reasonable steps must be taken to maintain and enhance biodiversity and promote the resilience of ecosystems and these should be balanced with the wider economic and social needs of business and local communities. Where adverse effects on the environment cannot be avoided or mitigated, it will be necessary to refuse planning permission.”

1.3 Paragraph 6.4.5 states that

“Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity. In doing so planning authorities must also take account of and promote the resilience of ecosystems.....”

TAN 5 Nature Conservation and Planning (Wales only)

1.4 Technical Advice Note (TAN) 5 supplements Planning Policy Wales and provides advice about how the land use planning system in Wales ‘should contribute to protecting and enhancing biodiversity and geological conservation.’

1.5 The TAN provides guidance to local planning authorities on: ‘the key principles of positive planning for nature conservation; nature conservation and Local Development Plans; nature conservation in development management procedures; development affecting protected internationally and nationally designated sites and habitats; and, development affecting protected and priority habitats and species.’

1.6 In section 2.4 when deciding planning applications that may affect nature conservation, ‘local authorities should:

- contribute to the protection and improvement of the environment...seeking to avoid irreversible harmful effects on the natural environment;
- ensure that appropriate weight is attached to designated sites of international, national and local importance;
- protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;

- ensure that all material considerations are taken into account and decisions are informed by adequate information about the potential effects of a development on nature conservation;
- ensure that the range and population of protected species is sustained;
- adopt a stepwise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered.'

1.7 At section 3.3.2 regarding Local Development Plans policies the guidance states that a policy should be included in respect of the application of the precautionary principle.

1.8 Section 4 includes specific and detailed guidance, expanding on the principles set out in 2.4, in respect of the development control process including pre-application discussions, preparing planning applications, requests for further information and ecology in respect of Environmental Impact Assessment (EIA). The broad principles of development control requirements are set out as follows:

- 'adopting the five-point approach to decision-making – information, avoidance, mitigation, compensation and new benefits;
- ensuring that planning applications are submitted with adequate information, using early negotiation, checklists, requiring ecological surveys and appropriate consultation;
- securing necessary measures to protect, enhance, mitigate and compensate through planning conditions and obligation;
- carrying out effective planning enforcement; and
- identifying ways to build nature conservation into the design of new development.'

Environment (Wales) Act 2016

1.9 The Environment (Wales) Act 2016 passed into law in March 2016. Part 1 of the Act sets out Wales' approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

1.10 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 so doing, 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 in relation to Wales, and applies to those authorities that fell within the previous duty.

1.11 Public authorities will be required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience. This is expanded on in sub-section (2):

1.12 In complying with subsection (1), a public authority must take account of the resilience of ecosystems, in particular the following aspects—

- diversity between and within ecosystems;
- the connections between and within ecosystems;
- the scale of ecosystems;
- the condition of ecosystems (including their structure and functioning);
- the adaptability of ecosystems.

- 1.13 Section 7 concerns biodiversity lists and the duty to take steps to maintain and enhance biodiversity. It replaces the duty in section 42 of the NERC Act 2006. The Welsh Ministers will publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales.
- 1.14 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.

European protected species (Animals)

- 1.15 The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.
- 1.16 “European protected species” (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:
- a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
 - b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
 - c. deliberately disturb wild animals of any such species
 - d. deliberately take or destroy the eggs of such an animal, or
 - e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place
- 1.17 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—
- a. to impair their ability—
 - i. to survive, to breed or reproduce, or to rear or nurture their young, or
 - ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - b. to affect significantly the local distribution or abundance of the species to which they belong.
- 1.18 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:
- a. The proposal is necessary ‘to preserve 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’
 - b. ‘There is no satisfactory alternative’
 - c. The proposals ‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Definition of breeding sites and resting places

- 1.19 Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.¹ Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that ‘The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.’ Further the guidance states: ‘It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.’

Competent authorities

- 1.20 Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a “competent authority” includes “any Minister of the Crown..., government department, statutory undertaker, public body of any description or person holding a public office.
- 1.21 In accordance with Regulation 9, “a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met.

Reptiles

- 1.22 All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as “European Protected species” under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) and are fully protected under the Wildlife and Countryside Act 1981 (as amended).
- 1.23 All six native species of reptile are included as ‘species of principal importance’ for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.
- 1.24 Current Natural England Guidelines for Developers² states that ‘where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.’ Further the guidance states: ‘Normally prohibited activities may not be illegal if ‘the act was the incidental result of a lawful operation and could not reasonably have been avoided’. Natural England ‘would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.’

¹ Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.

² English Nature, 2004. *Reptiles: guidelines for developers*. English Nature, Peterborough. <https://webarchive.nationalarchives.gov.uk/20150303064706/http://publications.naturalengland.org.uk/publication/76006>

- 1.25 The Natural England Guidelines for Developers state that ‘planning must incorporate two aims where reptiles are present:
- To protect reptiles from any harm that might arise during development work;
 - To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.’

Birds

- 1.26 All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.
- 1.27 The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, ‘Birds Directive’³) (Regulation 10 (3)) requires that the objective is the ‘preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive...’ Regulation 10 (7) states: ‘In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements’.
- 1.28 In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: ‘So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).’

Badger

- 1.29 Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as “a structure or place, which displays signs indicating current use by a badger”.
- 1.30 ODPM Circular 06/2005⁴ provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that “The likelihood of disturbing a badger sett, or adversely affecting badgers’ foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions.”
- 1.31 Natural England provides Standing Advice⁵, which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

³ 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.

⁴ ODPM Circular 06/2005. *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

⁵ <http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx>

Wild mammals in general

- 1.32 The Wild Mammals (Protection) Act 1996 (as amended) makes provision for the protection of wild mammals from certain cruel acts, making it an offence for any person to intentionally cause suffering to any wild mammal. In the context of development sites, for example, this may apply to rabbits in their burrows.

Hedgerows

- 1.33 Article 10 of the Habitats Directive⁶ requires that 'Member States shall endeavour...to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure...or their function as stepping stones...are essential for the migration, dispersal and genetic exchange of wild species'. Examples given in the Directive include traditional field boundary systems (such as hedgerows).
- 1.34 The aim of the Hedgerow Regulations 1997⁷, according to guidance produced by the Department of the Environment⁸, is "to protect important hedgerows in the countryside by controlling their removal through a system of notification. In summary, the guidance states that the system is concerned with the removal of hedgerows, either in whole or in part, and covers any act which results in the destruction of a hedgerow. The procedure in the Regulations is triggered only when land managers or utility operators want to remove a hedgerow. The system is in favour of protecting and retaining 'important' hedgerows.
- 1.35 The Hedgerow Regulations set out criteria that must be used by the local planning authority in determining which hedgerows are 'important'. The criteria relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective.

Invasive non-native species

- 1.36 An invasive non-native species is any non-native animal or plant that has the ability to spread causing damage to the environment.
- 1.37 Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to release, or to allow to escape into the wild, any animal which is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state or is listed under Schedule 9 of the Act.
- 1.38 It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

⁶ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

⁷ Statutory Instrument 1997 No. 1160 – The Hedgerow Regulations 1997. HMSO: London

⁸ The Hedgerow Regulations 1997: a guide to the law and good practice, HMSO: London

Technical Appendix 10-2 Figures and Target Notes

Buttington ERF

Technical Appendix 10.2:
Figures and Target Notes

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Client	ECL
Project	Buttington ERF
Version	DRAFT
Project number	P20-048 - Technical Appendix 10.2 Figures and Target Notes

	Name	Position	Date
Originated	Caroline O'Rourke	Senior Ecologist	23 July 2020
Reviewed	Owain Gabb	Director	29 July 2020
Approved for issue to client	Owain Gabb	Director	29 July 2020
Issued to client	Caroline O'Rourke	Senior Ecologist	29 July 2020

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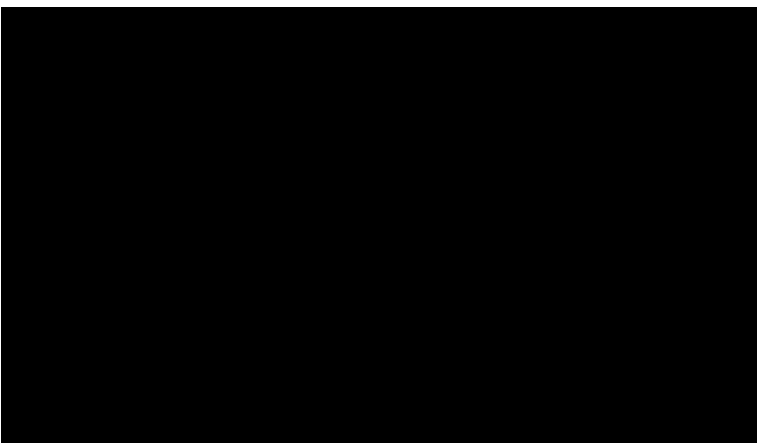
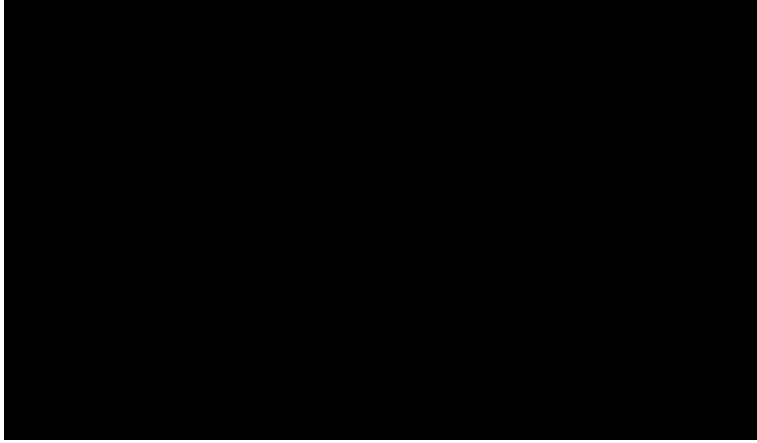
1 Phase 1 habitat survey target notes

Target note	Description	Photographs
1	<p>Main quarry base consisting of compacted stone. Largely unvegetated with a limited number of sparsely distributed stress tolerant species. Two ephemeral pools have formed in shallow, man-made excavations in the quarry floor. These are largely unvegetated with a little great reedmace and broadleaved pondweed. Quarry sides at the eastern extent are largely unvegetated.</p>	 <p>The photographs illustrate the quarry environment. The top image shows a gravel path leading through a quarry. The middle image shows a shallow pool of water with green aquatic plants. The bottom image shows a wide view of the quarry base with steep, unvegetated sides.</p>

<p>2</p>	<p>Settlement lagoon alongside main access track. Heavily shaded by adjacent Alder/willow woodland. Moderate algae cover indicating some level of nutrient enrichment but moderate diversity of macrophytes present including great reedmace, broadleaved pondweed, common duckweed and common water plantain. Connected to a small stream to the west via a narrow ditch.</p>	
<p>3</p>	<p>Settlement lagoon similar to TN 2 but less shaded and with greater cover of broadleaved pondweed and additional species including lesser spearwort. Bordered by bare substrate with scattered gorse and alder saplings.</p>	
<p>4</p>	<p>Damp depression/ephemeral pool holding <5cm water in a shallow depression between the adjacent willow scrub and an earth bund with ruderal vegetation. Some common water plantain, hard rush, jointed rush and great reedmace present.</p>	

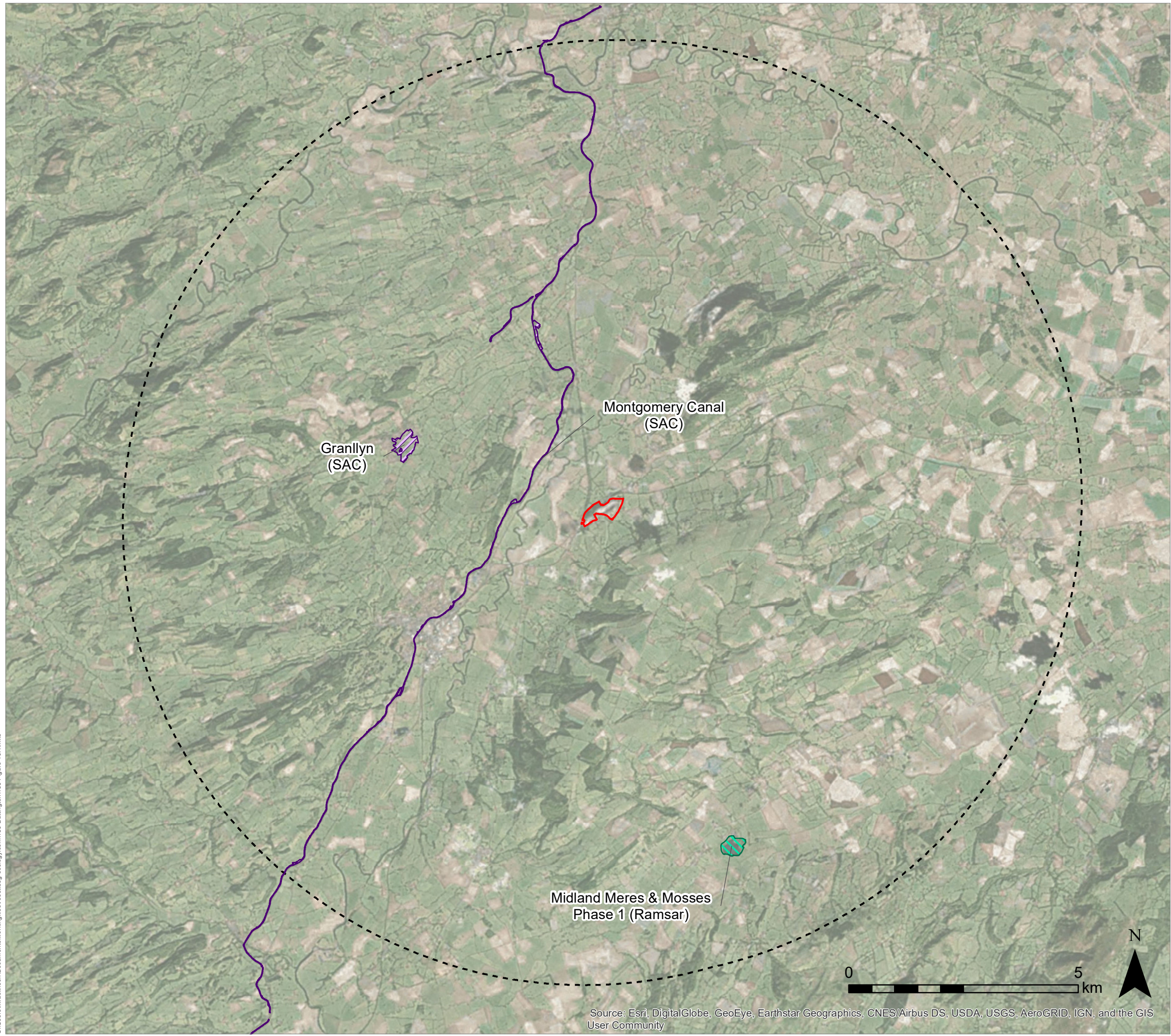
<p>5</p>	<p>Mosaic of ephemeral/short perennial vegetation, tall ruderals, bare ground and more established grassland with false oat grass, cock's-foot and Yorkshire-fog. Vegetation is herb rich with abundant knapweed, perforate St John's wort, bird's-foot trefoil, teasel, centaury and ox-eye daisy.</p>	 <p>The top photograph shows a wide view of a grassy field with a dirt path on the right. The field is filled with various wildflowers, including purple ones. The background shows a valley with trees and hills. The bottom photograph is a closer view of the field, showing a mix of green and brown vegetation with several purple flowers in the foreground.</p>
<p>6</p>	<p>Ephemeral/short perennial vegetation alongside main access track. Species composition similar to TN5 but low growing and less established with abundant pointed spear moss and creeping cinquefoil. Grades into ruderal vegetation and bramble/grey willow scrub towards the site boundary.</p>	 <p>The photograph shows a gravel access track on the right side. The vegetation is low-growing and consists of a mix of green and brown plants. Some purple flowers are visible in the foreground. The background shows a dirt path and some trees.</p>

<p>7</p>	<p>Semi-improved neutral grassland forming part of a remnant field system. Some management evident along with rabbit grazing resulting in a short sward.</p> <p>Moderate diversity with sweet vernal grass, Yorkshire fog and red fescue, crested dog's tail and common creeping cinquefoil, White clover, selfheal, meadow buttercup, bird's foot trefoil, smooth tare, common centaury and common knapweed.</p> <p>Some ruderal and scrub encroachment from the margins which are formed by outgrown native hedgerows.</p>	
<p>8</p>	<p>Relatively recently disturbed quarry sides with consistent/homogeneous topography. Loose substrate with sparsely distributed wood sage, colt's foot, teasel, perforate St John's wort. Common centaury, black medic, bird's foot trefoil and greater plantain in an open, dry mosaic with bare ground, patches of pointed spear moss, willowherbs and scattered scrub.</p>	





<p>9</p>	<p>Outlier or small subsidiary badger sett. Three entrances, one partially collapsed. No signs of recent use (debris in entrances) but guard hair in spoil at one location. Currently in use & expanded by rabbits (droppings and multiple rabbit holes present). Well-worn mammal path leading east/west along the contour to a latrine with several dung pits, one with old badger dung.</p>	
<p>10</p>	<p>Outlier badger sett with two entrance holes. No signs of recent use but possibly occupied earlier in the year based on the level of debris/leaf litter. Badger guard hair found at one entrance. Surrounding habitat of larch plantation with closed canopy and poorly developed, heavily shaded understorey and ground flora suppressed by a thick layer of needles.</p>	

2 **Figures**

(overleaf)



LEGEND

-  Site boundary
-  10 km buffer around the site boundary
-  Special Area of Conservation (SAC)
-  Ramsar site

Granllyn
(SAC)

Montgomery Canal
(SAC)

Midland Meres & Mosses
Phase 1 (Ramsar)

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PROJECT TITLE
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DRAWING TITLE
Figure 10.1: European and Internationally Designated Sites within 10 km of the site boundary

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DRAWN: KW APPROVED: OG VERSION: 1.0

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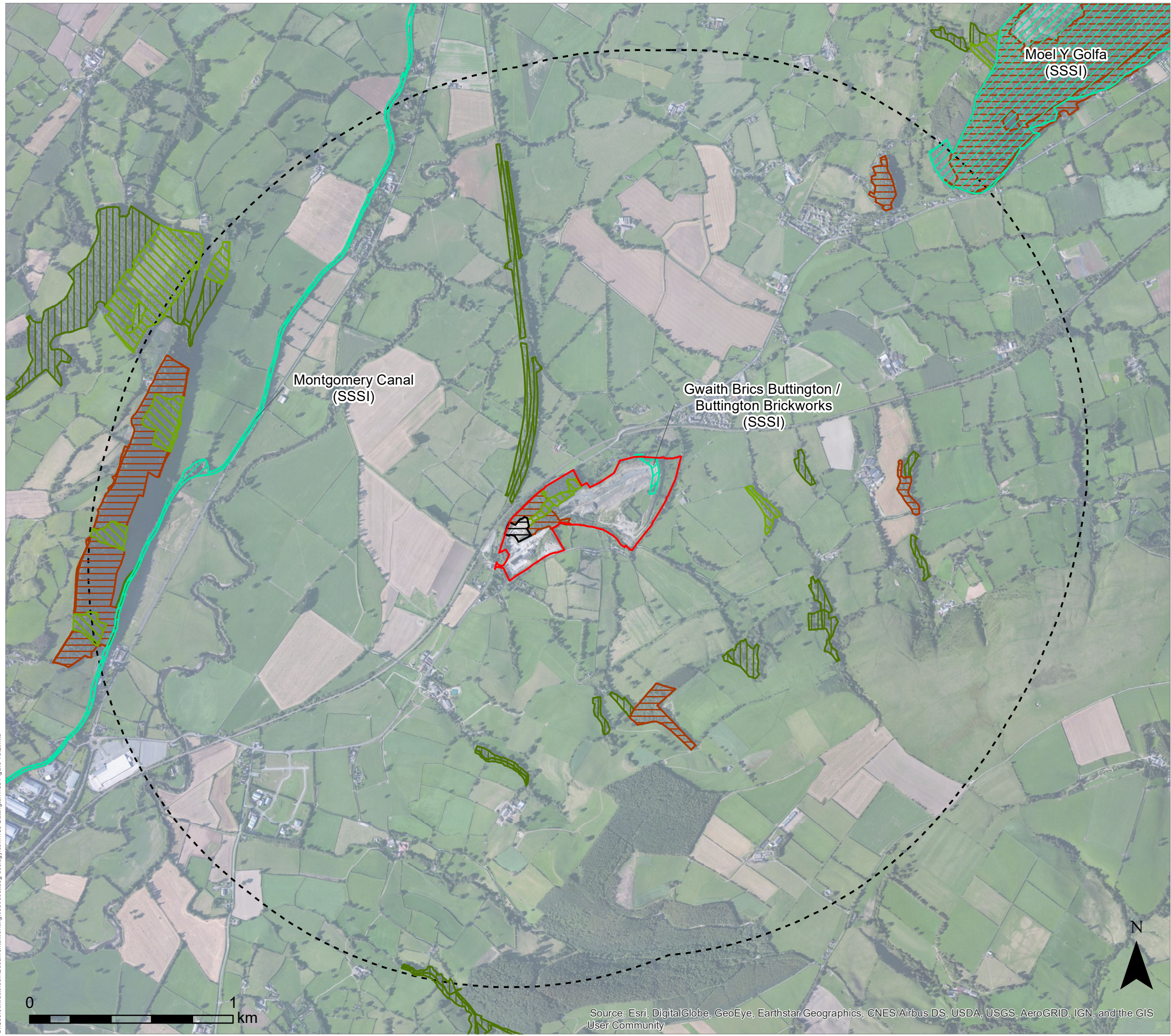
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LEGEND

- Site boundary
- 2 km buffer around the site boundary
- Site of Special Scientific Interest (SSSI)

Ancient Woodland

- Ancient Semi Natural Woodland
- Plantation on Ancient Woodland
- Restored Ancient Woodland
- Ancient Woodland Site of Unknown Category

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DRAWING TITLE
Figure 10.2: Nationally Designated Sites and Ancient Woodland within 2 km of the site boundary

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- Legend
- Broadleaved woodland - semi-natural
 - Coniferous woodland - plantation
 - Scrub - dense/continuous
 - Woodland - recently felled
 - Neutral grassland - semi-improved
 - Tall ruderal
 - Standing water
 - Ephemeral/short perennial vegetation
 - Buildings
 - Bare ground
 - Running water
 - Intact hedge - species-rich
 - Hedge with trees - species-rich
 - Hedge with trees - species-poor
 - Scattered scrub
 - Broadleaved tree
 - Target note

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DRAWING TITLE
Figure 10.3: Phase 1 Habitats

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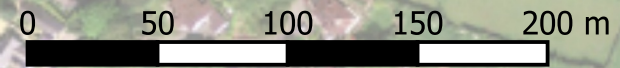
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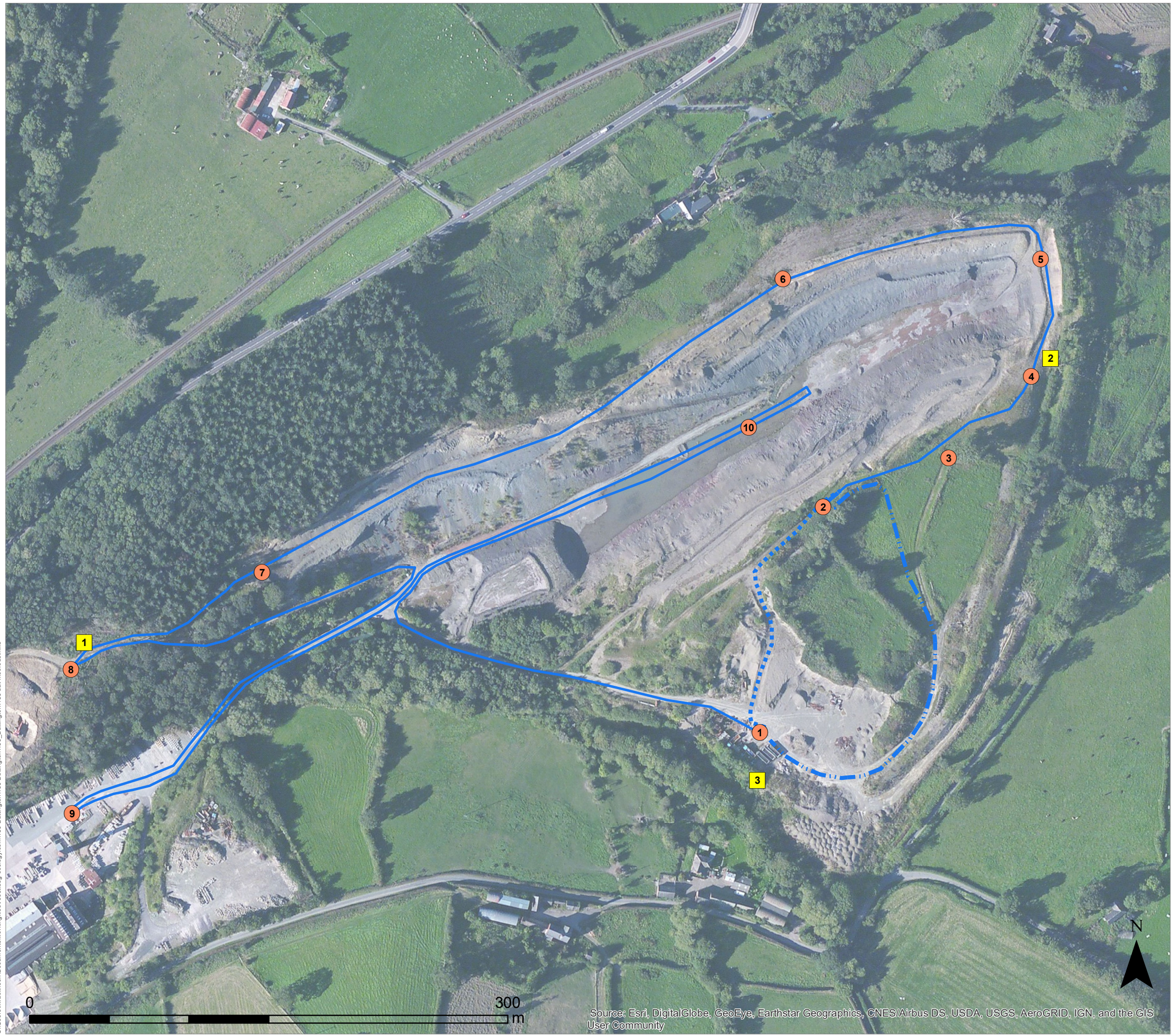
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- LEGEND**
- Route of transect lap walked
- Both
 - ⋯ Lap 1
 - - - Lap 2
 - Stop point
 - Static detector location

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DRAWING TITLE
Figure 10.4: Bat Transect Route and Static Detector Locations

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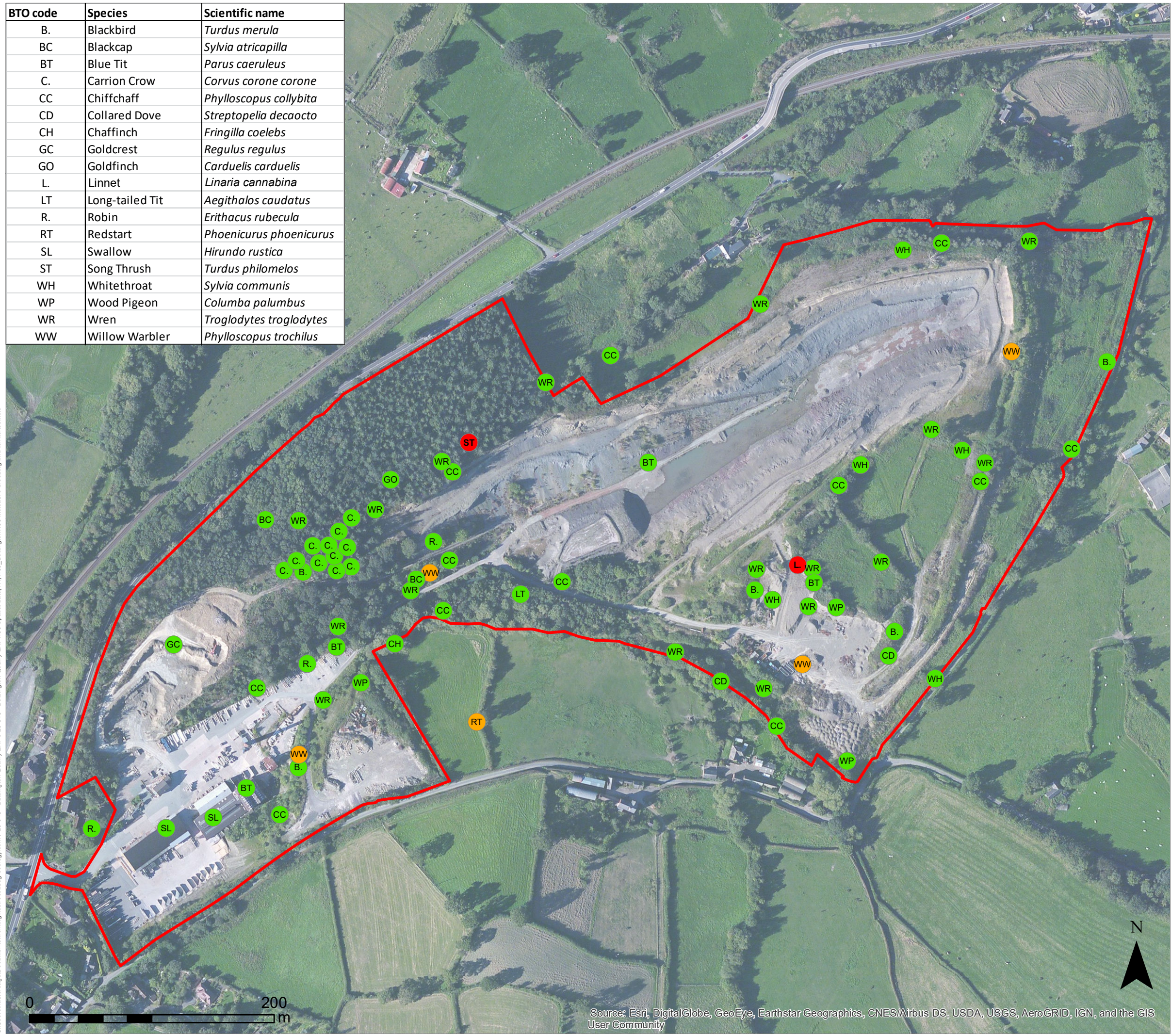
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BTO code	Species	Scientific name
B.	Blackbird	<i>Turdus merula</i>
BC	Blackcap	<i>Sylvia atricapilla</i>
BT	Blue Tit	<i>Parus caeruleus</i>
C.	Carrion Crow	<i>Corvus corone corone</i>
CC	Chiffchaff	<i>Phylloscopus collybita</i>
CD	Collared Dove	<i>Streptopelia decaocto</i>
CH	Chaffinch	<i>Fringilla coelebs</i>
GC	Goldcrest	<i>Regulus regulus</i>
GO	Goldfinch	<i>Carduelis carduelis</i>
L.	Linnet	<i>Linaria cannabina</i>
LT	Long-tailed Tit	<i>Aegithalos caudatus</i>
R.	Robin	<i>Erithacus rubecula</i>
RT	Redstart	<i>Phoenicurus phoenicurus</i>
SL	Swallow	<i>Hirundo rustica</i>
ST	Song Thrush	<i>Turdus philomelos</i>
WH	Whitethroat	<i>Sylvia communis</i>
WP	Wood Pigeon	<i>Columba palumbus</i>
WR	Wren	<i>Troglodytes troglodytes</i>
WW	Willow Warbler	<i>Phylloscopus trochilus</i>



LEGEND

Site boundary

BoCC Status

- Green list
- Amber list
- Red list



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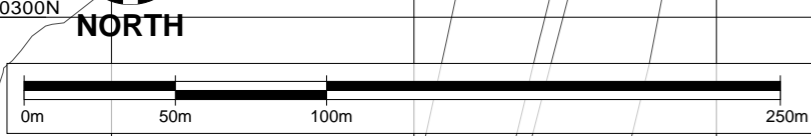
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Figure 10.5: Breeding Birds:
Indicative Territory Locations

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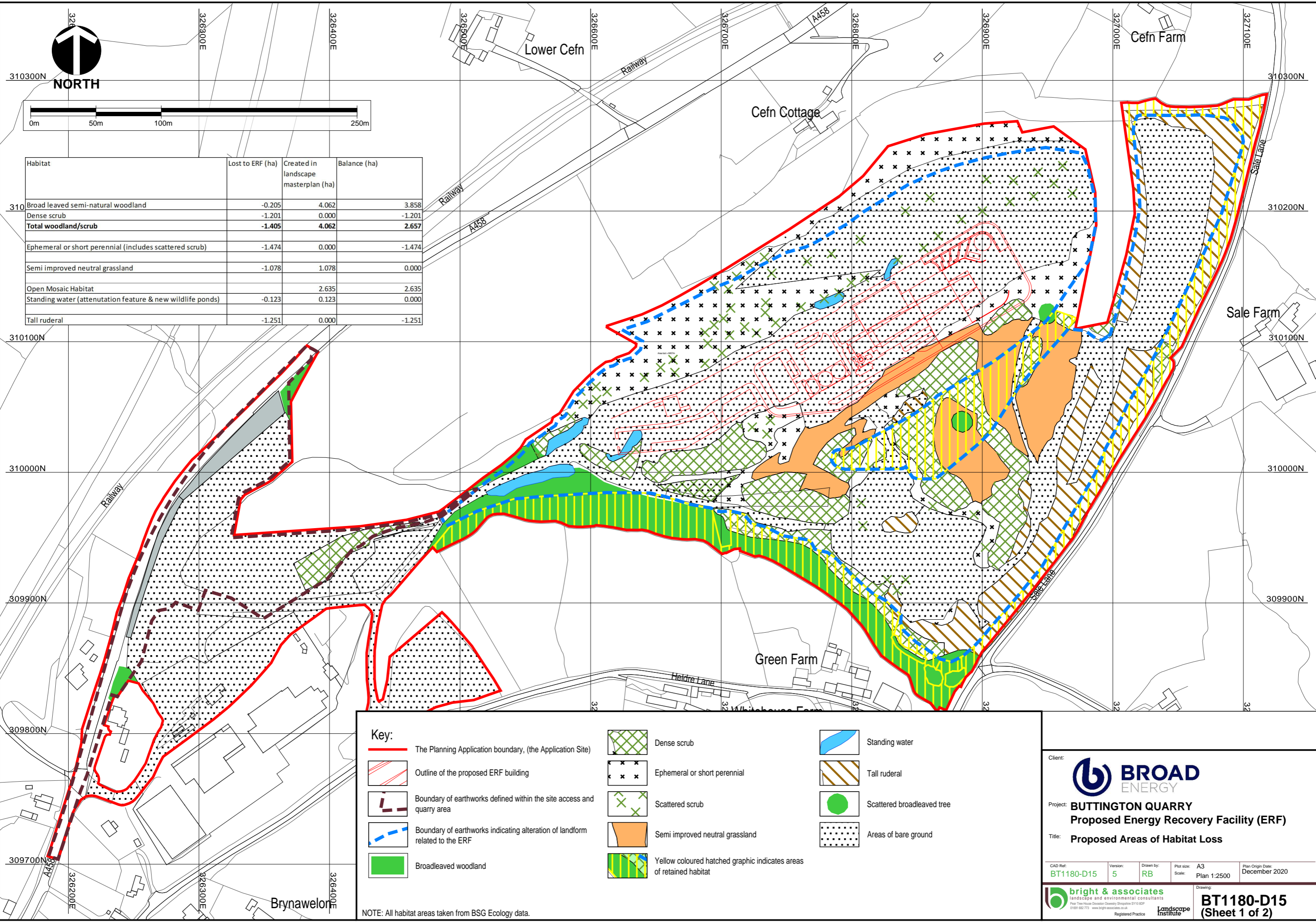
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Sources: BSG Ecology survey data

C:\Users\hatherage\Documents\working\files\roost\BTO\Buttington Quarry ERF\P20-048 - Buttington Quarry ERF\P20-048 - Buttington Quarry ERF\456 Indicative breeding bird territories.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Habitat	Lost to ERF (ha)	Created in landscape masterplan (ha)	Balance (ha)
310 Broad leaved semi-natural woodland	-0.205	4.062	3.858
Dense scrub	-1.201	0.000	-1.201
Total woodland/scrub	-1.405	4.062	2.657
Ephemeral or short perennial (includes scattered scrub)	-1.474	0.000	-1.474
Semi improved neutral grassland	-1.078	1.078	0.000
Open Mosaic Habitat		2.635	2.635
Standing water (attenuation feature & new wildlife ponds)	-0.123	0.123	0.000
Tall ruderal	-1.251	0.000	-1.251



Key:

- The Planning Application boundary, (the Application Site)
- Outline of the proposed ERF building
- Boundary of earthworks defined within the site access and quarry area
- Boundary of earthworks indicating alteration of landform related to the ERF
- Broadleaved woodland
- Dense scrub
- Ephemeral or short perennial
- Scattered scrub
- Semi improved neutral grassland
- Yellow coloured hatched graphic indicates areas of retained habitat
- Standing water
- Tall ruderal
- Scattered broadleaved tree
- Areas of bare ground

NOTE: All habitat areas taken from BSG Ecology data.

Client: **BROAD ENERGY**

Project: **BUTTINGTON QUARRY Proposed Energy Recovery Facility (ERF)**

Title: **Proposed Areas of Habitat Loss**

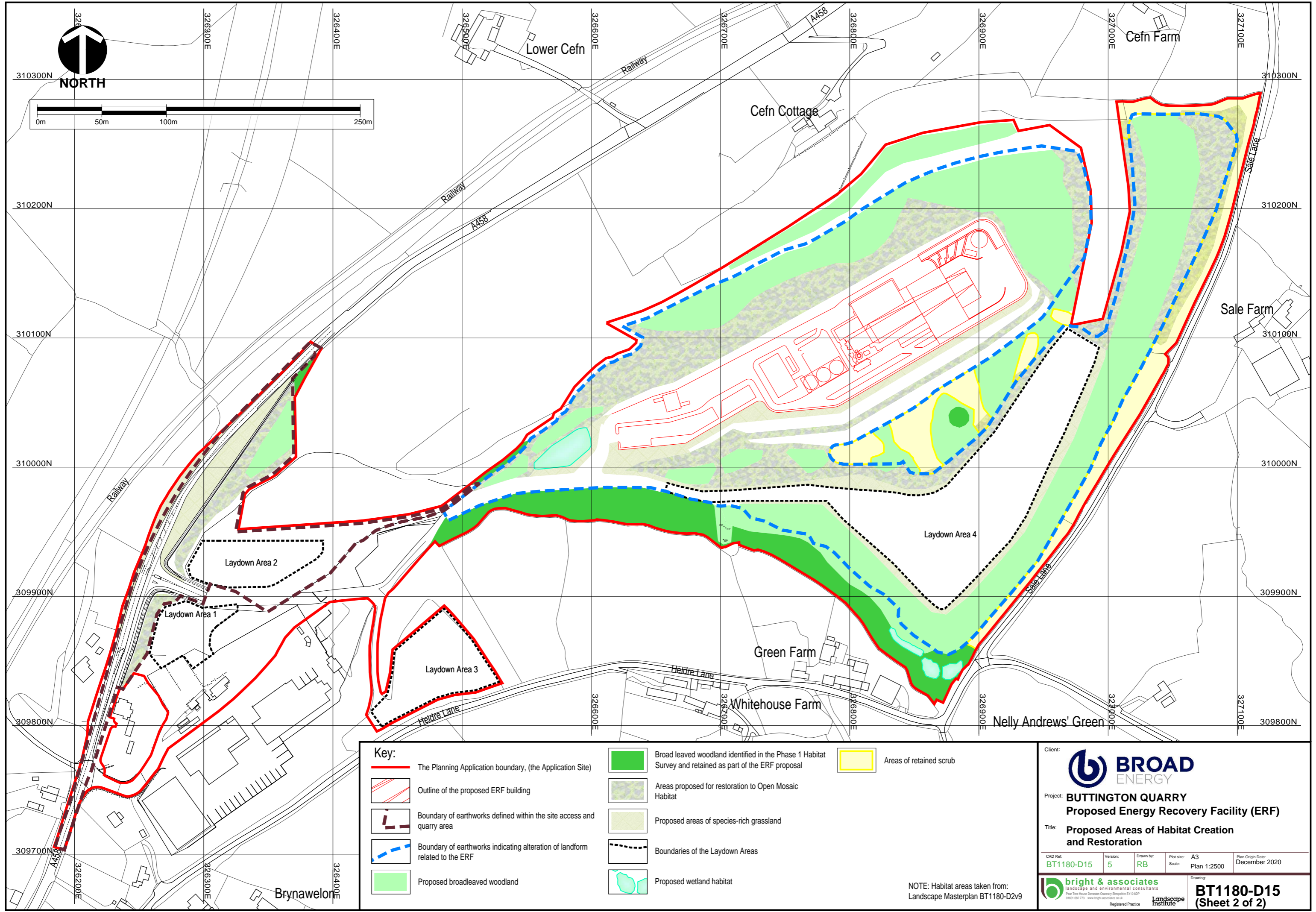
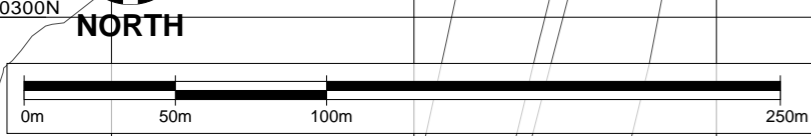
CAD Ref: **BT1180-D15** | Version: **5** | Drawn by: **RB** | Plot size: **A3** | Plan Origin Date: **December 2020**

Scale: **Plan 1:2500**

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BT1180-D15 (Sheet 1 of 2)



Key:	
	The Planning Application boundary, (the Application Site)
	Outline of the proposed ERF building
	Boundary of earthworks defined within the site access and quarry area
	Boundary of earthworks indicating alteration of landform related to the ERF
	Proposed broadleaved woodland
	Broad leaved woodland identified in the Phase 1 Habitat Survey and retained as part of the ERF proposal
	Areas proposed for restoration to Open Mosaic Habitat
	Proposed areas of species-rich grassland
	Boundaries of the Laydown Areas
	Proposed wetland habitat
	Areas of retained scrub

NOTE: Habitat areas taken from:
Landscape Masterplan BT1180-D2v9

Client: **BROAD ENERGY**

Project: **BUTTINGTON QUARRY Proposed Energy Recovery Facility (ERF)**

Title: **Proposed Areas of Habitat Creation and Restoration**

CAD Ref: BT1180-D15	Version: 5	Drawn by: RB	Plot size: A3	Plan Origin Date: December 2020
Scale: Plan 1:2500				

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BT1180-D15 (Sheet 2 of 2)

Technical Appendix 10-3 Methodology

Buttington ERF

Technical Appendix 10.3:
EclA Assessment Methodology

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Client	ECL
Project	Buttington ERF
Version	DRAFT
Project number	P20-048 - Technical Appendix 10.3 - Assessment Methodology

	Name	Position	Date
Originated	Caroline O'Rourke	Senior Ecologist	23 July 2020
Reviewed	Owain Gabb	Director	29 July 2020
Approved for issue to client	Owain Gabb	Director	29 July 2020
Issued to client	Caroline O'Rourke	Senior Ecologist	29 July 2020

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1 Ecological impact assessment methodology

Ecological assessment

- 1.1 The evaluation and assessment within Chapter 10 has been undertaken with reference to the Guidelines for Ecological Impact Assessment in the United Kingdom developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, September 2018).
- 1.2 This guidance aims to:
- promote good practice
 - promote a scientifically rigorous and transparent approach to Ecological Impact Assessment (EclA)
 - provide a common framework to EclA in order to promote better communication and closer cooperation between ecologists involved in EclA
 - provide decision-makers with relevant information about the likely ecological effects of a project.

Important ecological features

- 1.3 A first step in EclA is determination of which ecological features (habitats, species, ecosystems and their functions/processes) are important. Important features should then be subject to detailed assessment if they are likely to be affected by the Proposed Development. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project effects, such that there is no risk to their viability.
- 1.4 Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

Evaluation: determining importance

- 1.5 The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case:
- International (European).
 - United Kingdom.
 - Wales.
 - County (Powys).
 - Local (Montgomeryshire).
 - Site (the Development site and adjacent areas).
- 1.6 Taking into account the CIEEM guidance, features of less than local importance are generally considered unlikely to trigger the need for mitigation (unless there is a legal compliance issue) or to conflict with policy.

- 1.7 Features which require mitigation in order to ensure legal compliance are considered to be important features, even if their conservation value is low or not applicable (e.g. badger, which is not a rare species but which receives legal protection on animal welfare grounds).

Features to be excluded from further assessment

- 1.8 The assessment focuses on those ecological features likely to be subject to significant effects (adverse or beneficial).
- 1.9 It is typically possible to scope out some ecological features from detailed assessment. Those features unlikely to be affected by the proposals and/or which are of low ecological value can typically be excluded/scoped out of detailed assessment.

Assessment of effects

- 1.10 The assessment of significance process involves:
- identifying and characterising significant effects.
 - incorporating measures to avoid and mitigate (reduce) these significant effects.
 - assessing the significance of any residual effects after mitigation.
 - identifying appropriate compensation measures to offset significant residual effects.
 - identifying opportunities for ecological enhancement.
- 1.11 Industry standard guidance (CIEEM, 2018) notes that it is only essential to assess and report significant residual effects (those that remain after mitigation measures have been taken into account). However, guidance also notes that it is good practice for the EclA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation (CIEEM, 2018). This process of assessment without mitigation helps to identify necessary and relevant mitigation measures that are proportionate to the nature and scale of anticipated effects.
- 1.12 Industry standard guidance (CIEEM, 2018) also notes that the assessment only needs to describe those characteristics of impacts that are relevant to understanding ecological effects and determining their significance. It should consider, as appropriate: direct, indirect, secondary and cumulative effects and whether these are short, medium, long-term, permanent, temporary, reversible and / or irreversible. In this chapter, positive effects are referred to as beneficial; negative effects as adverse. The assessment of significant effects then takes into account the baseline conditions to describe:
- how the baseline conditions will change as a result of the project and associated activities.
 - cumulative effects of the proposal and those arising from other developments
- 1.13 While industry standard CIEEM (2018) guidance requires ecologists to use their knowledge and experience to undertake assessments (and does not support a matrix-based approach to assessment), it does provide an indication on the factors (criteria) considered in the process of determining significance of impacts.
- 1.14 For consistency with other sections of the Environmental Statement, these, along with a description of what they refer to, are set out in Table 1 below.

Table 1 : Environmental Effects Assessment Evaluation Criteria

Criteria	Description
Magnitude of Impact (Mg)	Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
Geographic Extent of Impact (GE)	The extent is the spatial or geographical area over which the impact/effect may occur under a suitably representative range of conditions.
Frequency of Impact (F)	The number of times an activity occurs will influence the resulting effect. The timing of an activity or change may also result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.
Duration of Impact (D)	Duration is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. Impacts and effects may be described as short, medium or long-term and permanent or temporary. These need to be defined in months/years.
Reversibility of Impact (R)	An irreversible effect is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation. In some cases, the same activity can cause both reversible and irreversible effects.
Ecological and Socio-economic Context of Impact (ESC)	EclA can provide ecological information to support the assessment of ecosystem services. It is important to recognise cases where ecosystem service provision might be affected as a result of a project's ecological effects. However, assessment of ecosystem services relies on separate specialist assessments of social and economic value.

Significant effects

- 1.15 CIEEM guidance sets out information in paragraphs 5.24 through to 5.29 about the concept of ecological significance and how it relates to the ability to deliver biodiversity conservation objectives for a given feature.
- 1.16 Significant effects are qualified with reference to an appropriate geographic scale. The scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important (i.e. because it may only affect that feature in part).
- 1.17 The nature of the identified significant effect on each assessed feature is characterized; this is considered, along with available research, professional judgement regarding the sensitivity of the feature affected, and professional judgement regarding how the site, habitat, or population's structure and continued function is likely to be affected. Where it is concluded that an effect would be likely to reduce the ecological importance of a feature, it is described as significant. The degree of

significance of the effect takes into account the geographic context of the feature’s importance and the degree to which its interest is judged to be affected. The CIEEM guidance encourages the expression of the severity of ecological effects with reference to a geographic frame of reference, as described above. However, other disciplines within this Environmental Statement use a relative scale of severity with four categories (Major, Moderate, Minor or Negligible).

1.18 Table 2 provides a means of relating the geographic scale of impact to the four standard categories of severity, and is provided in order to allow the ecological impact assessment to be integrated into the wider EIA without compromising the CIEEM approach (CIEEM, 2018).

Table 2: Relationship between ecological impact assessment and wider EIA assessment of significance (based on Box *et al.*, 2017).

Geographic scale of impact (as per CIEEM 2016 guidance)	
Severity	
International, European, national or regional	Major
Regional, metropolitan, county, vice-county or other local authority-wide area.	Moderate
Local	Minor
Site or below	Negligible

1.19 Once the geographic scale and severity of the effect has been assessed, professional judgement is then used to assess the significance of that effect, taking into account factors such as the likelihood of affecting the distribution, abundance (and ultimately the conservation status) of protected species, or affecting the connectivity or quality of protected habitats, or of breaches in wildlife legislation or contravention of planning policy.

Mitigation

1.20 Where significant effects are identified, the principles of the mitigation hierarchy are applied. These are set out in Paragraph 1.19 of the CIEEM (2018) guidance as follows:

- **Avoidance.** Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
- **Mitigation.** Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

- **Compensation.** Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- **Enhancement.** Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

1.21 Where mitigation and compensation is proposed, this should be proportionate to the geographical scale at which an effect is significant, *'For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved'* (CIEEM, 2018. Paragraph 5.28).

2 Personnel

- 2.1 Short summaries of the experience of key project personnel are below.
- 2.2 The extended Phase 1 habitat survey was completed by Caroline O'Rourke, Senior Consultant Ecologist. Caroline has worked in ecological consultancy since 2009. She has expertise in Phase 1 habitat and hedgerow survey, holds a Level 4 Field (botanical) Identification Skills Certificate (FISC) from the Botanical Society of Britain and Ireland, and licences to survey dormouse and great crested newt in England and Wales. Caroline also has considerable experience of bat, badger, otter and water vole survey.
- 2.3 The bat and great crested newt eDNA survey work were co-ordinated by Rachel Taylor, Principal Consultant Ecologist. Rachel holds NRW bat and great crested newt survey licences (Refs 78540 and 76037) and has led the ecological input to various large renewables, construction, and heritage sector projects in Wales. Her recent work includes acting as the named ecologist on a great crested newt mitigation licence in connection with the development of a new High School in Brecon, Powys, and for a new rail facility (station and test track) at Llanwern, Newport.
- 2.4 Bird surveys were completed by James Garside, Consultant Ecologist. James is an accomplished field ornithologist who has undertaken bird surveys in connection with large wind farms, residential and infrastructure schemes. His experience also includes working for NRW at the Newport Wetlands Reserve, where he undertook wetland bird surveys, and voluntary survey on behalf of the British Trust for Ornithology (Breeding Bird Surveys and Chat Surveys).
- 2.5 The 2020 GCN and bat surveys were undertaken by Stuart Thomas. Stuart is an experienced consultant ecologist and ornithologist, holds level 1 & 2 bat survey licences and great crested newt survey licences from both NE and NRW and is a full member of CIEEM.

**Technical Appendix 10-4
2020 Bat Survey Report**

Buttington Quarry
Bat Survey Report 2020

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Client	Environmental Compliance Ltd
Project	Buttington Quarry Bat Survey Report 2020
Version	FINAL
Project number	P20-048 Buttington Quarry Bat Survey 2020

	Name	Position	Date
Originated	Charlotte Alsop	Consultant Ecologist	16 October 2020
Reviewed	Owain Gabb	Director	20 October 2020
Approved for issue to client	Owain Gabb	Director	21 October 2020
Issued to client	Caroline O'Rourke	Senior Ecologist	26 October 2020

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2	Methods.....	4
3	Results and Interpretation	6
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1 Background and Context

- 1.1 Broad Energy (Wales) intends to submit a planning application to Welsh Ministers for an Energy Recovery Facility (ERF) and ancillary infrastructure to be located at Buttington Quarry, Buttington, Welshpool, Powys, SY21 8SZ (the Site).
- 1.2 Bat survey work was completed at the Site in 2018. This involved automated detector and transect survey work, and was used to inform the baseline for scoping and the Ecological Impact Assessment for the proposed ERF.
- 1.3 This short technical report provides an overview of the methods and results of additional bat survey completed in 2020, and provides an update to the previous work. The approach to the survey work in 2020, which included automated detector and transect survey work, is consistent with that undertaken previously and is based on current industry standard guidance (Collins, 2016).
- 1.4 The purpose of this report is to provide additional up to date information that can be used to confirm the bat community associated with the Site.

2 Methods

2.1 Methods for the field survey carried out in 2020 are provided below. These are consistent with methods undertaken in 2018 and are based on current industry standard guidance (Collins, 2016).

Automated survey

2.2 Automated detector surveys were conducted using Wildlife Acoustics Song Meter 2 (SM2) bat detectors. Industry standard guidance (Collins, 2016) recommends that for areas of moderate suitability for bats, at least two automated detector locations per transect (see below) are surveyed each month.

2.3 In order to sample the various habitats present on and adjacent to the Site, three detectors were deployed each month from April to October 2020 inclusive. The location of each detector (D1, D2 and D3) is shown in **Figure 1**.

2.4 Static detectors were deployed to collect data for a period of five consecutive nights each month from April to October 2020; we therefore aimed to collect a total of 105 nights of data. The detectors were set to record from half an hour before sunset to half an hour after sunrise, the period during which bats are usually active away from their roosts. The duration of recording per night varied throughout the survey period according to day / night length. This variation was accounted for using correction factors at the data analysis stage.

Transect survey

2.5 In addition to the automated survey, a walked transect survey was carried out during each month from June to October 2020 inclusive.

2.6 All transect surveys were undertaken by Stuart Thomas MCIEEM (see paragraph 2.18) accompanied by an assistant (for health and safety purposes when night working). Each transect survey started at sunset, and took a minimum of two hours to complete. The timing of the surveys therefore covered the bat emergence / re-entry period and the period of most intense foraging activity when invertebrate prey is most abundant (Altringham, 2003).

2.7 Each survey followed a pre-determined route (see **Figure 1**), which was designed to sample the different habitats present on and adjacent to the Site. Transect surveys were supplemented by spot counts at ten stop points along the transect route. The duration of each spot count was five minutes, and allowed the surveyor to hear / observe and count bat passes more effectively without being distracted by navigation and noise from footfall.

2.8 Surveyors used two bat detectors on each survey to supplement visual observations and to record calls for subsequent identification: a Wildlife Acoustics EMT, and either a Wildlife Acoustics EM3 or Titley Scientific Anabat SD2 bat detector. Identification of recorded bat calls was carried out using AnalookW software (by Titley Scientific). The species analysis follows the call parameters described in Russ (2012).

2.9 Surveyors noted any bat activity heard or seen on an annotated plan. Field notes included a record of the time of each bat encounter, allowing results to be cross-referenced with the recorded data.

2.10 All walked transects avoided heavy rain, strong winds and temperatures below 10°C as recommended in industry standard guidelines (Collins, 2016).

Limitations to methods

2.11 During the April and June deployments the detector at D1 failed to record data, and during the July deployment the detector at D2 failed to record data. On these occasions, the detectors were re-

deployed for further nights to increase the number of recorded nights to five and this is not considered a limitation.

- 2.12 During the May deployment, the detector at D3 failed to record data. This detector was re-deployed with the intention of increasing the number of recorded nights to five. However, only one night of data was successfully recorded and a second re-deployment was not possible, as it was June when the detector was collected. This resulted in 101 nights of bat data being collected over the survey season, instead of the 105 hours planned. Bat activity is calculated as a rate (bat passes per hour), and therefore the shorter survey period has been accounted for and comparison of bat activity levels can be made (albeit comparison of May data from D3 to other detector results was undertaken with caution). It is considered that the dataset is sufficient to provide a comprehensive assessment of bat activity at the Site, and this is not considered a limitation.
- 2.13 Walked transects were not completed in April and May due to complications accessing the site caused by Covid restrictions. However, automated detectors were deployed during April and May 2020 meaning that bat activity data was still collected during those months. It is not believed that the lack of transect data from April and May 2020 presents any significant constraint to the characterisation of use of the Site by bats.

Project personnel

- 2.14 The team involved in the completion of the work has been:
- 2.15 Owain Gabb MSc, MCIEEM: Owain is a Director at BSG Ecology, and is the reviewer of this report. Owain has worked as a professional ecologist since 1999; he has been involved in many ecological assessments, and reviews a wide range of ecological reports.
- 2.16 Charlotte Alsop BSc MRes, Qualifying member of CIEEM: Charlotte is a Consultant Ecologist at BSG Ecology and has over four years' experience conducting bat surveys. Charlotte undertook bat survey work and is the author of this report.
- 2.17 Kirsty Rogers MSc, ACIEEM: Kirsty is a Senior Ecologist at BSG Ecology and has worked as professional ecologist since 2013. Kirsty holds a Level 1 bat survey licence from Natural Resources Wales (NRW) (licence number SO99094/1). Kirsty undertook bat survey work for this project.
- 2.18 Stuart Thomas BSc, MCIEEM: Stuart has over twenty years' of professional experience as an ecologist, and holds a Level 1 bat survey licence from NRW (licence number SO88121/1). Stuart undertook bat survey work for this project.
- 2.19 A summary of each BSG staff member's experience and competence as professional ecologist is provided at <http://www.bsg-ecology.com/index.php/people/>. A detailed summary of Stuart's experience can be supplied on request.

3 Results and Interpretation

Automated survey

- 3.1 Seven species of bat were recorded within the Site during the automated surveys. These species were: barbastelle bat *Barbastella barbastellus*, common pipistrelle *Pipistrellus pipistrellus*, lesser horseshoe bat *Rhinolophus hipposideros*, long-eared bat *Plecotus* sp., *Myotis* sp., noctule *Nyctalus noctula* and soprano pipistrelle *Pipistrellus pygmaeus*.
- 3.2 In addition, nine hundred and twenty-four bat calls were recorded for which parameters overlapped between species. These could therefore not be confirmed to the species level and are displayed as two species, separated by a forward slash (e.g. common / soprano pipistrelle) in the table below. There were also five hundred and forty-nine passes that could not be identified (labelled as "Unidentified bat sp." in the tables below). These passes were pipistrelle social calls, but had no primary echolocation call (flight call) associated with them. Therefore, although these calls can be confidently identified as bat calls, it is not possible to attribute them to a particular species.
- 3.3 Two species were recorded in 2018 which were not recorded in 2020. These were Nathusius' pipistrelle *Pipistrellus nathusii* (1 pass recorded in 2018), and serotine *Eptesicus serotinus* (17 passes recorded in 2018). No species were recorded in 2020 which were not also recorded in 2018.
- 3.4 The calls recorded during the automated surveys in 2020 are summarised in Table 1. The highest levels of bat activity were recorded at D1 (13,607 P, 41.1 P/h), and the lowest levels of bat activity were recorded at D3. This is consistent with the relative activity levels recorded between detectors at the Site in 2018.

Table 1 – Bat activity (P/h) per species recorded on automated detectors (D1-D3). Note: total bat passes (P) is also included.

Species	Detector			Total (P)	Total (P/h)
	1	2	3		
Barbastelle bat	0.1	0.1	<0.1	61	0.1
Common / Nathusius' pipistrelle	0.1	0.2	<0.1	129	0.1
Common / soprano pipistrelle	1.6	0.3	0.2	694	0.7
Common pipistrelle	11.4	7.2	0.8	6,386	6.6
Lesser horseshoe bat	0.2	0.5	<0.1	237	0.2
Long-eared bat sp.	0.2	0.2	0.1	150	0.2
Myotis / long-eared bat sp.	0.1	<0.1	<0.1	47	0.0
Myotis sp.	1.8	0.2	0.1	701	0.7
Noctule	0.8	1.7	1.0	1,126	1.2
Noctule / Leisler's bat	0.1	0.1	<0.1	54	0.1
Soprano pipistrelle	23.2	9.7	1.1	11,228	11.7
Unidentified bat sp.	1.5	0.2	0.0	549	0.6
Total (P)	13,607	6,761	994	21,362	
Total (P/h)	41.1	20.4	3.3		22.2

- 3.5 The most frequently recorded species was soprano pipistrelle (11,228 P, 11.7 P/h), and common pipistrelle was the second most frequently recorded species (6,386 P, 6.6 P/h). Noctule was recorded at an activity level of 1.2 P/h, and all other species were recorded at activity levels < 1 P/h. These numbers represent average activity levels recorded across all three detectors at the Site. The pattern of relative activity levels between species is consistent with the results of the 2018 automated survey.
- 3.6 Forty-one soprano pipistrelle passes were recorded before sunset, and a further 1,463 soprano pipistrelle passes were recorded within twenty minutes of sunset. All but one of these passes was recorded at D1 or D2 (862 P and 600 P respectively). A further two hundred and forty-seven soprano pipistrelle passes were recorded within 20 minutes of sunrise at D1 (169 P) and D2 (78 P).
- 3.7 The timing of these early and late¹ soprano pipistrelle passes is well within the emergence and re-entry time for this species, indicating the likely presence of roosts in close proximity to D1, likely in the woodland to the north of the Site. The highest numbers of early and late passes were recorded in August (752 P) and in September (464 P), and may relate to bats dispersing from summer maternity colonies and moving to mating roosts.
- 3.8 Fifteen noctule bat passes were recorded before sunset, and a further one hundred and twenty-five noctule bat passes were recorded within twenty minutes of sunset. The majority of these passes were recorded at D2 (51 P) and D3 (54 P). A further ten noctule bat passes were recorded within 20 minutes of sunrise at D1 (3 P), D2 (5 P) and D3 (2 P).
- 3.9 The timing of these early and late noctule bat passes is well within the emergence and re-entry time for this species, indicating that there is likely to be a roost nearby. The majority of the early and late passes were recorded in August (62 P) and may relate to bats dispersing from summer maternity colonies and moving to mating roosts.
- 3.10 Six common pipistrelle passes were recorded before sunset, and a further four hundred and eighty-five common pipistrelle pass were recorded within 20 minutes of sunset. The majority of these passes were recorded at D1 (381 P), and the rest were recorded at D2 (110 P). A further fifteen common pipistrelle bat passes were recorded within 20 minutes of sunrise at D1 (4 P) and D2 (11 P).
- 3.11 The timing of these early and late common pipistrelle passes is well within the emergence and re-entry time for this species, indicating that there is likely to be a roost nearby. The majority of the early and late passes were recorded in August (204 P) and may relate to bats dispersing from summer maternity colonies.
- 3.12 Early and late passes were also recorded for soprano pipistrelle, common pipistrelle and noctule during the automated surveys in 2018, with D1 recording the majority of early and late passes in both years. These results strongly indicate local roosting, likely in woodland to the north of the Site.

Transect survey

- 3.13 A summary of weather conditions for each activity transect survey is included in Appendix 1.
- 3.14 Five species of bat were confirmed within the Site during the walked transects. These species were: common pipistrelle *Pipistrellus pipistrellus*, long-eared bat *Plecotus* sp., *Myotis* sp., noctule *Nyctalus noctula*, and soprano pipistrelle *Pipistrellus pygmaeus*.
- 3.15 In addition, twenty-four bat calls were recorded for which parameters overlapped between species. These could therefore not be confirmed to the species level and are displayed as two species, separated by a forward slash (e.g. common / soprano pipistrelle) in the tables that follow. There were also eight passes that could not be identified (labelled as "Unidentified bat sp." in the tables below). These passes were pipistrelle social calls, but had no primary echolocation call (flight call)

¹ An 'early pass' is defined as a pass recorded before sunset or within 20 minutes after sunset, and a 'late' pass is defined as a pass recorded after sunrise or within 20 minutes before sunrise.

associated with them. Therefore, although these calls can be confidently identified as bat calls, it is not possible to attribute them to a particular species.

3.16 The calls recorded during the transect surveys each month are summarised in Table 2 below.

Table 2 – Bat activity (bat passes per hour (P/h) per species for each monthly transect
Note: total number of passes (P) for each species is also included

Species	Transect					Total (P)	Total (P/h)
	1	2	3	4	5		
Common / Soprano pipistrelle	1.6	0.8	2.6	0.9	0.0	21	1.2
Common pipistrelle	11.8	8.3	1.1	9.1	0.3	110	6.2
Long-eared bat sp.	0.0	0.6	1.1	0.3	0.3	8	0.5
<i>Myotis</i> / long-eared bat sp.	0.3	0.0	0.0	0.0	0.0	1	0.1
<i>Myotis</i> species	0.3	0.3	0.0	0.3	0.0	3	0.2
Noctule	0.5	1.9	2.0	0.9	1.2	23	1.3
Noctule / Leisler's bat	0.0	0.0	0.3	0.3	0.0	2	0.1
Soprano pipistrelle	15.3	16.1	17.4	8.2	8.0	231	13.1
Unidentified bat sp.	0.0	0.0	2.3	0.0	0.0	8	0.5
Total (P)	111	101	94	68	33	407	
Total (P/h)	29.9	28.1	26.9	19.9	9.8		23.1

- 3.17 The walked transect surveys indicated that pipistrelle activity was most concentrated around the woodland edge in the western part of the Site, and along the hedgerows and treeline that run between the quarry pit and adjoining fields along the north-eastern boundary of the Site.
- 3.18 Noctule bat and long-eared bat sp. passes were more evenly spread throughout the Site and passes by *Myotis* sp. were only recorded in the southern part of the Site.
- 3.19 A handful of passes were recorded in the base of the quarry, belonging to common pipistrelle (2 passes), long-eared bat sp. (1 pass) and noctule bats (2 passes).
- 3.20 Overall, the pattern of bat activity recorded across the Site during the transect surveys in 2020 is very similar to that recorded in 2018. In 2018, bats were most concentrated in the western area of the Site along the woodland edge, and a considerable number of bat passes were recorded along the north-eastern boundary of the Site. Lower activity levels were recorded across the rest of the Site including in the base of the quarry.

4 References

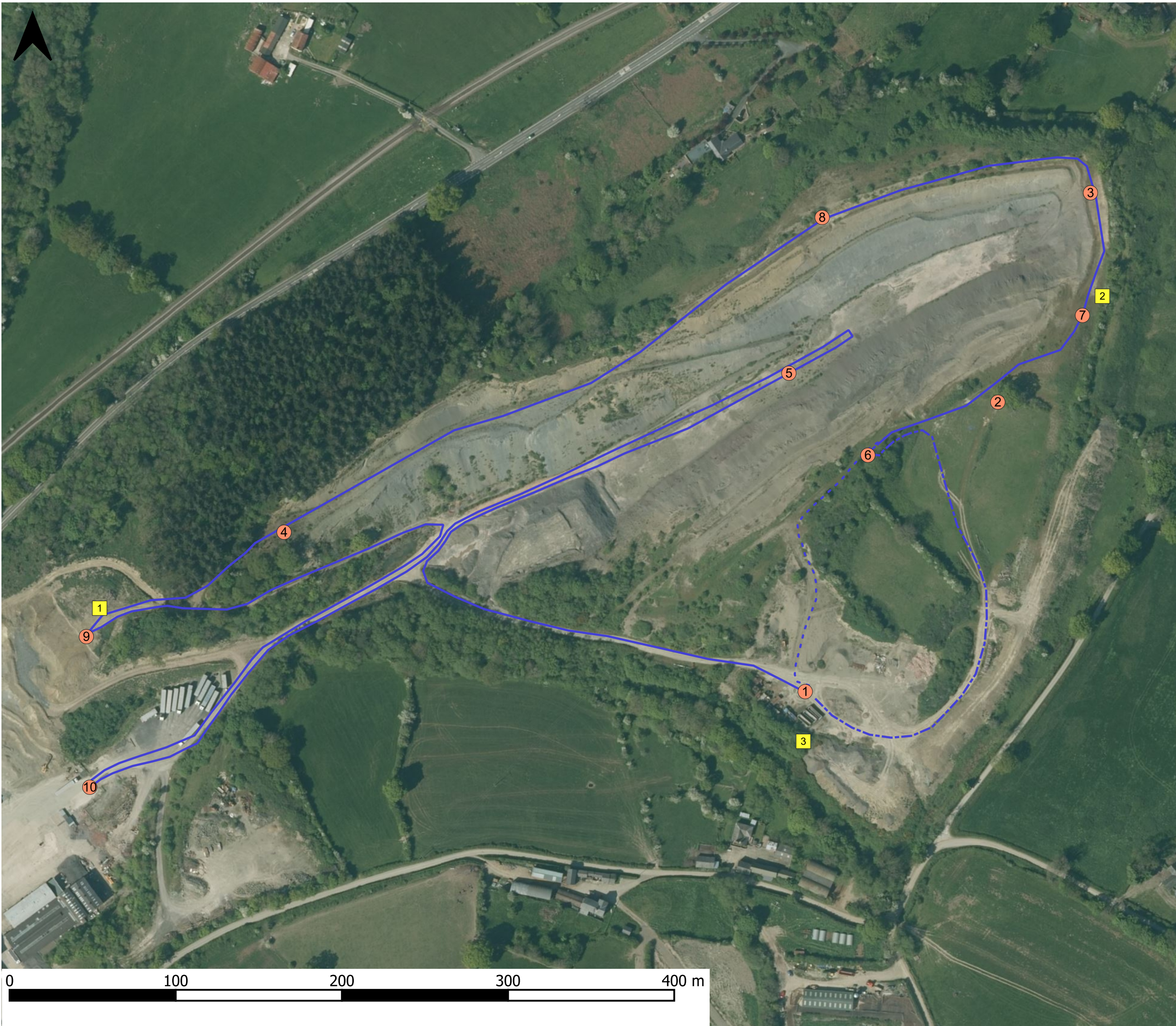
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5 **Figures**

(overleaf)



- Legend
- Route of transect route walked
 - Both
 - - - Lap 1
 - - - Lap 2
 - Stop points
 - Static detector locations

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PROJECT TITLE
 Buttington EfW EIA and Survey Updates 2020

DRAWING TITLE
 Figure 1: Bat transect route and static detector locations

DATE: 15.10.2020 CHECKED: OG SCALE: 1:3,600
 DRAWN: CA APPROVED: OG VERSION: 1.0

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No dimensions are to be scaled from this drawing.
 All dimensions are to be checked on site.
 Area measurements for indicative purposes only.

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Sources: BSG Ecology survey data

6 Appendices

Appendix 1: Weather conditions for each activity transect

Table 3 – Dates, times and weather conditions recorded during the bat activity transect surveys².

Date	Sunset time	Time		Temperature (°C)		Wind Beaufort Scale (1 - 8)		Cloud cover (0 - 8)		Precipitation	
		Start	Finish	Start	Finish	Start	Finish	Start	Finish	Start	Finish
29/06/2020	21:41	21:33	01:16	13	11	3-4	3	8	8	Light drizzle	None
27/07/2020	21:12	21:05	00:41	15	14	1-2	2-3	8	8	Light drizzle	None
21/08/2020	20:24	20:10	23:40	15	16	1-2	2-3	8	8	None	None
29/09/2020	18:51	18:40	22:05	12	9.5	1-2	1	4	5	None	None
08/10/2020	18:32	18:25	21:48	10	8	1-2	1	2	0	None	None

² Wind strength is given in the Beaufort scale. This is an empirical measure that relates wind speed to observed conditions at sea or on land. Cloud cover is measured in oktas, ranging from 0 oktas (completely clear sky) through to 8 oktas (completely overcast).