



Natural Resources Wales

ABBHEY CONSOLS MINE

Preliminary Ecological Appraisal





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EXECUTIVE SUMMARY

Natural Resources Wales (NRW) commissioned WSP to complete a Preliminary Ecological Appraisal (PEA) of Abbey Consols Mine (also known as Bronberllan or Florida Mine). Abbey Consols Mine has been selected to undergo remediation works to improve the water quality of the Afon Teifi under the Water Framework Directive (WFD).

The area surveyed comprised Abbey Consols Mine, including the motor racing track which passes through it, and pastoral fields grazed by livestock along the Afon Teifi and the associated riparian zone (Central Grid Reference: SN 7430066115). The surveyed area is approximately 5.9 hectares in size.

A desk study was undertaken and identified four statutory nature conservation sites within 2km of the centre of the site; the Afon Teifi Special Area of Conservation (SAC), Coed Mynachlog-Fawr Site of Special Scientific Interest (SSSI), Elenydd-Mallaen SSSI and Rhos Gargoed SSSI.

An Extended Phase 1 habitat survey of the site was carried out on the 24th May 2018 to inform the PEA. The purpose of the site visit was to assess the ecological value of the site, recording any protected or otherwise important habitats and any evidence/potential for notable or protected species.

The field survey recorded signs of badger *Meles meles* and otter *Lutra lutra* on site, along with suitable habitat for supporting bats, birds, reptiles, invertebrates, fish and lower plants.

Certain species, habitats and nature conservation sites receive legislative and policy protection which is detailed fully within Appendix A. At this early stage, limited information is known, in regard to the scale of works proposed however, the current recommendations are based upon the disturbance and temporary loss of habitat during the remediation works including the retention and protection of semi-mature and mature trees throughout the site however, when the detailed design is available, the need for species surveys may need to be reassessed.

In summary, the following surveys are recommended to inform mitigation and/or licensing procedures in order for the remediation works to comply with relevant legislation and policy:

- Hibernation and swarming surveys for bats if works to mine shaft required;
- Badger surveys, including wildlife camera deployment;
- Otter surveys;
- Fish surveys if works will result in degradation and/ or disturbance to the river habitat;
- Bryophyte and lichen surveys; and
- Precautionary Methods of Working and Ecological Supervision of Works.

Recommendations for ecological enhancements are provided in Section 4.6 and will include:

- Reopening the Abbey Consols adit entrance;
- Provision of bird and bat boxes;
- Provision of invertebrate hotels, habitat piles;
- Avoid herbicide/pesticide use;
- Natural regeneration using topsoil from the site;
- Good horticultural practice; and
- A low intensity management program.

INTRODUCTION

1.1 BACKGROUND

PROJECT BACKGROUND

- 1.1.1. Metal mine sites in Britain present significant sources of water pollution. Across Wales abandoned mines are the number one reason for water bodies failing to achieve 'Good Status' under the Water Framework Directive (WFD). One of the rivers adversely affected by abandoned metal mines is the Afon Teifi, which is designated as a Special Area of Conservation (SAC) and Special Site of Scientific Interest (SSSI).
- 1.1.2. Investigations carried out to date confirmed that Abbey Consols is a major source of zinc and lead to the Afon Teifi, which is failing to achieve WFD standards for metals in at least 40km of river, including four separate WFD water bodies.
- 1.1.3. Abbey Consols Mine (also known as Bronberllan or Florida Mine) is located near the village of Pontrhydfendigaid, 9km northeast of Tregaron, Ceredigion. The site possesses one point source discharge from an adit that has collapsed in on itself which is directed to the north east corner of the site. This bounds an area of fine and coarse mine spoil within the central portion of the Site, which includes a more localised area of fine tailings/slimes. The location of the site is shown in Figure 1.
- 1.1.4. Abbey Consols has been selected to undergo remediation works to improve water quality in the Afon Teifi. At this early stage limited information is known regarding the scale of works proposed, however they are likely to include a Surface Water Management System to reduce polluted runoff from the waste tips and a treatment system for the adit discharge. The site location and site boundary are shown in Figure 2.

ECOLOGICAL BACKGROUND

- 1.1.5. The area surveyed comprises Abbey Consols Mine, including the motor racing track which passes through it, and pastoral fields grazed by livestock along the Afon Teifi and the associated riparian zone (Central Grid Reference: SN 7430066115). The surveyed area is approximately 5.9 hectares in size.
- 1.1.6. The site is surrounded by agricultural land and sparse woodland copses. The Afon Teifi to the south connects the Site to the wider environment and to larger areas of woodland (via the linear riparian habitat which flanks the Afon Teifi). The fields on site are used by livestock and the grassland is grazed short.
- 1.1.7. There are ecological constraints already identified at the site in the form of metallophyte lichens and bryophytes which have been reported in; Survey of the Lower Plant Interest at Abbey Consols zinc mine, Ceredigion and Mitigation for Remediation Works (Chambers and Forster Brown, 2016) and Survey for *Ditrichum plumbicola* Lead Moss on three disused mines in eastern Ceredigion (Bosanquet, 2016).

1.2 SCOPE OF REPORT

- 1.2.1. Natural Resources Wales (NRW) commissioned WSP to complete a Preliminary Ecological Appraisal (PEA) of the site in accordance with "CIEEM Guidelines for Preliminary Ecological Appraisal" in May 2018. The brief was:
 - To provide baseline ecological information about the site and the surrounding area with particular reference to whether legally protected and/or notable sites, species or habitats are present or likely to be present;
 - To provide recommendations to enable compliance with relevant nature conservation legislation and planning policy; and
 - If necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and/or further ecological surveys.

1.3 RELEVANT LEGISLATION AND POLICY

- 1.3.1. The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in Wales. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details are presented in Appendix A.
 - The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations);
 - The Wildlife and Countryside Act 1981 (as amended) (WCA);
 - Countryside Rights of Way Act 2000;

- The Protection of Badgers Act 1992;
- The Wild Mammals (Protection) Act 1996;
- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
- UK Biodiversity Action Plan (UKBAP)¹;
- Environment Act 1995;
- Environment (Wales) Act 2016;
- Well-being of Future Generations (Wales) Act 2015;
- Technical Advice Note 5; Nature Conservation and Planning 2009;
- Planning Policy Wales (Welsh Government), Chapter 5 Conserving and Improving Natural Heritage and the Coast Edition 9, 2016;
- Ceredigion Local Development Plan 2007-2022; and
- The Local Biodiversity Action Plan for Ceredigion 2002.

¹ The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

2 METHODS

2.1 OVERVIEW

- 2.1.1. This appraisal has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2013 and 2015), and Joint Nature Conservation Committee (JNCC, 2010); and guidance contained in the British Standard - Code of Practice for Biodiversity and Development BS42020:2013 (British Standards Institute (2013)).
- 2.1.2. This PEA is based on the following data sources:
- An ecological desk study;
 - An Extended Phase 1 habitat survey; and
 - A protected/notable species assessment.

2.2 DESK STUDY

- 2.2.1. The desk study was undertaken on the 20th May 2018 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within a 2km radius of the site. This approach is consistent with current good practice guidance published by the CIEEM, 2013 and 2015. To provide the baseline data for the ecological desk study, the following information was requested from West Wales Biological Record Centre (WWBIC):
- Records of legally protected and notable species within 2km of the site; and
 - Bat records within a 2km radius of the site.
- 2.2.2. Freely downloadable datasets (available from NRW) were consulted for information regarding the presence of statutory designated habitats² within 2km of the Site. This search was extended to 10km for Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) of European importance and internationally designated Ramsar sites.
- 2.2.3. Information provided by NRW confirmed that no non-statutory designated sites are located within 2km of the site.
- 2.2.4. Freely downloadable datasets (available from NRW) were consulted for information regarding Habitats of Principal Importance (HPI)³ within 1km.
- 2.2.5. The findings of the desk study have been incorporated within Section 3 and Appendix B of this report, and are shown on Figure 3.

2.3 HABITAT SURVEY

- 2.3.1. An Extended Phase 1 habitat survey of the site was carried out on the 24th May 2018 in dry, overcast conditions. The survey covered the entire site including boundary features as shown on Figure 1. Where accessible, an overview of habitats surrounding the site was gathered. The Phase 1 habitat survey was carried out by a full member of CIEEM, with extensive experience within the last nine years of completing PEAs of a variety of greenfield and brownfield sites and a graduate member of CIEEM with experience of habitat surveys and mapping.
- 2.3.2. Habitats were described and mapped following the standard Extended Phase 1 habitat survey methodology (JNCC, 2010). Extended Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species are recorded and habitats are classified according to their vegetation types. Where appropriate consideration was given to whether habitats qualify, or could qualify, as a Habitat of Principal Importance following habitat descriptions published by the Joint Nature Conservation Committee (JNCC, 2008).

² Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

³ Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances these are primarily based on aerial photograph analysis rather than field survey.

- 2.3.3. A list of plant species was compiled (Appendix C), with relative plant species abundance estimated using the DAFOR scale⁴. The scientific names for plant species follow those in the New Flora of the British Isles (Stace, 2010) and are also listed in Appendix C.
- 2.3.4. Habitats were marked on a mobile mapping computer and were subsequently digitised using a Geographical Information System (GIS).
- 2.3.5. Target notes were made to provide information on specific features of ecological interest (e.g. a badger *Meles meles* sett) or habitat features too small to be mapped. These are included in Appendix D. Any invasive plant species listed on Schedule 9 of the WCA 1981 (as amended) which were evident during the Extended Phase 1 habitat survey were also target noted.

2.4 PROTECTED SPECIES ASSESSMENT

- 2.4.1. The potential for the site to support legally protected and notable species was assessed using the desk study results and combined with field observations during the Extended Phase 1 habitat survey. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement. This was supplemented by standard sources of guidance on habitat suitability assessment for key faunal groups including: birds (Gilbert et al, 1998 and Bibby et al, 2000); reptiles (Froglife, 1999 and Gent and Gibson, 2003); bats (Collins, 2016 and Mitchell-Jones, 2004); badger (Harris et al, 1991 and Roper, 2010); otter (Chanin, 2003); and invertebrates (Drake et al, 2007 and Kirby, P, 2001).

2.5 NOTES AND LIMITATIONS

- 2.5.1. Every effort has been made to provide a comprehensive description of the site; however, the following specific limitations apply to this assessment:
 - Ecological survey data is typically valid for two years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management.
 - Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.
 - The Extended Phase 1 habitat survey was carried out over the period of a single day, as such only a selection of all species that occur within the site will have been recorded. However, through use of desk study information to supplement site survey data, it is considered that an accurate assessment of the potential for the site to support protected species or those of conservation concern was possible.
 - The Extended Phase 1 habitat map (Figure 4) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a PEA, the maps are not intended to provide exact locations of key habitats.

⁴ The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

3 RESULTS

3.1 DESIGNATED SITES STATUTORY SITES

3.1.1. The desk study identified four statutory nature conservation sites within 2km of the centre of the site. A description of the European and National sites are detailed in Table 1 below and shown in Figure 3.

Table 1 - Statutory designated sites of European and National importance.

Site Name	Designation	Size (ha)	Approximate Distance and orientation from Site	Description
Afon Teifi	SSSI/SAC	773	Immediately south of the site	The river is of European importance for its populations of fish, including Atlantic salmon <i>Salmo salar</i> , and there is also an important population of otters <i>Lutra lutra</i> . The full designation for this Site is included in Appendix E.
Coed Mynachlog-Fawr	SSSI	17.3	400m to the south of the site	A large area of mainly un-coppiced, shrub-rich, sessile oak <i>Quercus petraea</i> wood with mire and flush communities in clearings, on the south bank of the river Lasfrwd at Strata Florida. Many of the oaks support rich lichen and bryophyte growth.
Elenydd-Mallaen	SPA/SSSI	8.6	1.9km east of the site	The site is of interest for its range of breeding birds, including internationally important numbers of red kite <i>Milvus milvus</i> , peregrine falcon <i>Falco peregrinus</i> and merlin <i>Falco columbarius</i> .
Rhos Gargoed	SSSI	3	1.7km northeast of the site	An upland area of unimproved herb-rich grassland situated on a south-facing slope in the upper Teifi valley at an altitude of 290 metres.

NON-STATUTORY SITES

3.1.2. The desk study identified no non-statutory nature conservation sites within 2km of the site.

3.2 HABITAT SURVEY OVERVIEW

3.2.1. The following account summarises the findings of the Extended Phase 1 habitat survey. A total of 13 Extended Phase 1 habitat types were identified at the site and are mapped on Figure 4. A description of the dominant and notable species, the composition and management of each habitat is provided below and an indicative species list is provided for each habitat type in Appendix C. Target notes are provided in Appendix D and photographs in Appendix G. Alpha-numeric codes used in this section cross-refer to the JNCC Phase 1 habitat survey classification (JNCC, 2010). The order of the habitat descriptions below reflects their ordering in the Extended Phase 1 habitat survey manual and does not reflect habitat importance. Photographs 1-4 of Appendix G give a general over view of the habitats and the layout of the site.

BROADLEAVED SEMI-NATURAL WOODLAND (A1.1.1)

- 3.2.2. An area of broadleaved semi-natural woodland lines the river corridor. This area is dominated by mature sessile oak trees, ash *Fraxinus excelsior*, alder *Alnus glutinosa* and hazel *Corylus avellana* which provide shade to the sparse understorey below. The understorey consists of hemlock water-dropwort *Oenanthe crocata*, lady-fern *Athyrium filix-femina*, greater stitchwort *Stellaria holostea*, lesser celandine *Ficaria verna* and bramble *Rubus fruticosus* agg. The habitat was grazed and poached along the northern edge.

SCATTERED SCRUB (A2.1)

- 3.2.3. Areas of scattered scrub are dotted along the southwest of the site, north of the river embankment and to the north of the site, above the area of hardstanding and below the quarry. The scrub consisted of bramble and mature gorse *Ulex europaeus* bushes.

SEMI-IMPROVED ACID GRASSLAND (B1.2)

- 3.2.4. North of the motor racing track was a fenced off area of quarry with a sheer cliff face. An area of bare rock and loose scree located at target note (TN) B1.2 (1) below, this was colonised by semi-improved acid grassland. The grassland was rough and tussocky with a thatched sward dominated by sheep's-fescue *Festuca ovina*, sheep's Sorrel *Rumex acetosella*, heath bedstraw *Galium saxatile*, common bent *Agrostis capillaris* and sweet vernal-grass *Anthoxanthum odoratum*. Colonising bryophytes were present on the bare rock. To the north above the quarry there was a more diverse understorey characterised by bluebells *Hyacinthoides non-scripta*, creeping soft-grass *Holcus mollis* and areas of bracken *Pteridium aquilinum* shaded by overhanging mature, sessile oak trees.
- 3.2.5. To the northwest of the site at TN B1.2 (2), a field of semi-improved acid grassland was bordered by wire fencing. The dominant species in this area were sweet vernal-grass, pignut *Conopodium majus* and creeping soft-grass with occasional mouse-ear-hawkweed *Hieracium pilosella* and sheep's Sorrel. The relatively open, grazed short sward had a moss understorey, and graduated to the east into bracken and scattered trees. To the north, scattered sessile oak stands on a steep slope amongst scattered anthills.
- 3.2.6. An area of semi-improved acid grassland was identified colonising the top of a coarse spoil heap in the middle of the race track at TN B1.2 (3). A short, open sward was recorded with a moss understorey. Species included frequent sheep's fescue and sweet vernal-grass, with occasional mouse-ear-hawkweed and common bird's-foot-trefoil *Lotus corniculatus*. Bare exposed rock was colonised by bryophytes and lichens. The habitat was gently undulating due to the spoil substrate below and was bordered by hardstanding (the race track) and relatively recently excavated spoil heaps that are not yet colonised by vegetation.
- 3.2.7. A mosaic of semi-improved acid grassland with ephemeral vegetation and bare ground was identified to the south of the race track at TN B1.2 (4). There was a miscellany of flat open grassland and undulating areas on top of old spoil heaps and bare ground. This included areas of exposed peat with associated lichens, with visual signs of heavy metal contamination (orange staining). The grazed short, open sward was characterised by abundant sheep's-fescue and sweet vernal-grass, with occasional heath wood-rush *Luzula multiflora*. A moss understorey was noted with rare stands of bilberry *Vaccinium myrtillus* and heather *Calluna vulgaris*, and damper areas with patches of creeping soft-grass and floating sweet-grass *Glyceria fluitans*. To the east, the remnants of a building still partially stands including one wall still intact, with scattered mounds of rock and slate.
- 3.2.8. A mosaic of semi-improved acid grassland with scattered anthills, and damper areas of marshy grassland was recorded to the southwest of the site at TN B1.2 (5). The area was bordered by the stream to the south and an earth bund to the north. The dominant species were characterised by heath wood-rush, sheep's-fescue, soft-rush *Juncus effusus* and mouse-ear-hawkweed.

SEMI-IMPROVED NEUTRAL GRASSLAND (B2.2)

- 3.2.9. An area of shortly grazed semi-improved neutral grassland was identified to the east of the site at B2.2 (1). Relatively uniform, short sward grazed by sheep which graduated into marshy grassland at the north with mossy hummocks. This relatively herb poor field was dominated by sweet vernal-grass with occasional red fescue *Festuca rubra*, perennial rye-grass *Lolium perenne* and smooth meadow-grass *Poa pratensis*. The field was flanked by mature oak trees and the river to the south, and bordered by wire fencing, with occasional scattered trees, a dry stone wall and an earth bund.

- 3.2.10. A small parcel of semi-improved neutral grassland flanked the northern edge of the race track at TN B2.2 (2). Three mature trees, an oak *Quercus* sp. and two ash, in the northern corner provide canopy cover over a small patch of damp grassland. The field edge showed signs of nutrient enrichment with locally frequent common nettle *Urtica dioica*. The grassland was characterised by sweet vernal-grass and smooth meadow-grass with occasional cock's-foot *Dactylis glomerata*.
- 3.2.11. A corridor of semi-improved neutral grassland was located along the river at TN B2.2 (3) with a short, open sward which was poached in areas. The grassland becomes species-poor to the north. A large, old oak overhung the river channel. Trees line the river edge and to the east the embankment becomes sandy.

MARSHY GRASSLAND (B5)

- 3.2.12. The habitat directly west of the area of hard standing at TN B5 (1) was a tussocky, purple moor-grass *Molinia caerulea* dominated marshy grassland. There was a peat ground substrate, which was exposed in some areas or covered with *Sphagnum* sp. A relatively diverse assemblage of plant species was noted, particularly in the habitat immediately west of the site boundary, this was dominated by purple moor-grass, jointed rush *Juncus articulatus* interspersed with heath wood-rush, tormentil *Potentilla erecta*, cross leaved-heath *Erica tetralix*, bilberry *Vaccinium myrtilloides* and heath spotted-orchid *Dactylorhiza maculata*,
- 3.2.13. An area of marshy grassland was identified to the south of the site at B5 (2). Water from the wet ditch drains through this area into the river, showing visual contamination with orange staining on the rocks and discolouration of the plants species.
- 3.2.14. An area of marshy grassland dominated by Yorkshire-fog *Holcus lanatus* and soft-rush was identified to the far southwest of the site at TN B5 (3). The area was rank and species-poor, becoming more diverse to west (just outside of the site). The area is tussocky and contained a moss understorey.

POOR SEMI-IMPROVED GRASSLAND (B6)

- 3.2.15. An area of poor semi-improved grassland with some acid indicators was identified to the south of the race track at TN B6 (1). The area was grazed by cattle and was rank with locally abundant stands of soft-rush. A limited number of anthills were recorded. The dominant species include red fescue, moss species and Yorkshire-fog. The habitat graduates into woodland understorey towards the river to the south. Bluebells and common sorrel *Rumex acetosa* are associated with a mosaic of bracken and soft-rush were noted near the water's edge.

RUNNING WATER (G2)

- 3.2.16. A adit discharge creates a wet ditch that borders the race track to the east at TN G2 (1). The flow was trickling and slow, with algae (possible eutrophic), fed by a culvert. The ditch channel was dominated by Yorkshire-fog which was discoloured yellow. No marginal vegetation was recorded.
- 3.2.17. The Afon Teifi runs to the south of the site at TN G2 (2). A shingle bed was noted and limited aquatic vegetation was observed. The banks of the river varied in height and consisted mainly of earth and rock held in place by the root systems of overhanging trees, which give some shading to the river channel. The channel was approximately 5m wide, relatively shallow, with a stone substrate.
- 3.2.18. The water was fast flowing within the channel containing a mixture of substrates and in-stream features such as gravels and stony substrates. There was little sediment and scarce amounts of algae in the water. Some fish species within the channel were recorded. Dead wood was noted within the channel restricting the flow in some areas. There was a 5m long shingle bed along the edge of the northern embankment shown in TN 8.

ROCK EXPOSURE AND WASTE OTHER EXPOSURE – ACID/ NEUTRAL (I1.4.1)

- 3.2.19. Along the western section of the river at TN I141 (1) B1.2 (6) an inland cliff was noted. It was colonised by a short, open sward of semi-improved acid grassland comprising occasional mat-grass *Nardus stricta*, sheep's-fescue, mouse-ear-hawkweed and cat's-ear *Hypochaeris radicata*, with locally abundant heather. As shown in photograph 5 of Appendix G.

QUARRY (I2.1)

- 3.2.20. An area of fenced off quarry was recorded north of the Site at (I2.1). This comprised bare rock.

ROCK EXPOSURE AND WASTE ARTIFICIAL – SPOIL (I2.2)

- 3.2.21. Spoil heaps are scattered to the south of the quarry. They vary in extent of colonisation by plants.

EPHEMERAL/ SHORT PERENNIAL (J1.3)

- 3.2.22. Along the northern section of the race track at TN J1.3 (1) was an area of bare rock and bare ground colonised by ephemeral plants with some acid grassland indicator species. It comprised a short, dry, open sward, sparsely vegetated with lower plants. A patchy cover of plants included sheep's-fescue, sweet vernal-grass, heath bedstraw and sheep's sorrel. Dog lichen *Peltigera* sp. was colonising the bare rock and substrate.

DRY DITCH (J2.6)

- 3.2.23. Two dry ditches border the purple moor-grass dominated marshy grassland.

FENCE (J3.4)

Much of the Site is bordered and separated into fields by wire fencing.

3.3 PROTECTED AND NOTABLE SPECIES ASSESSMENT

- 3.3.1. The potential for the site to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the site survey of habitats within and immediately surrounding the site. A summary of desk study information is included within Appendix B. Desk study records have only been considered below if they are recent (from the last 10 years) and/or if they relate to species that may be supported by habitats at the site. Habitats present within the site are suitable for the following species; further consideration is given below to the likelihood for these species to be present within the site:

- Bats;
- Badger;
- Birds;
- Otter;
- Reptiles;
- Fish;
- Invertebrates; and
- Lower plants.

BATS

- 3.3.2. The desk study returned one record of bats with 2km of the site. This comprised one record of a bat roost located within the attic of a house. This record comprised three individuals of common pipistrelle *Pipistrellus pipistrellus*. There were no other records of bat species within 2km of the site.
- 3.3.3. The site contained several trees with potential to support roosting bats as detailed in TN4, 5 and 6 in Appendix D. The mine shafts may provide suitable hibernation and swarming sites for bats however were not accessible during the survey. The river provides suitable commuting and foraging routes for bats. The species will be considered further in this report.

BADGER

- 3.3.4. The desk study returned no records of badger *Meles meles* from within 2km of the site.
- 3.3.5. During the site visit several tunnels were identified within a spoil heap at TN 7. Several of the tunnels were small and round and in likely use by rabbit (although no rabbit droppings or hairs were recorded). Two larger D-shaped tunnels, characteristic of badger sett entrances, were also recorded. They were both recently used, with fresh excavated spoil, and a badger hair was found in the entrance to one of the holes. Photos of the potential badger sett entrances are provided in Appendix G. There were no other signs of badger activity noted during the Extended Phase 1 habitat survey. Overall, the habitats on site were considered suboptimal for badgers due to limited tree and scrub cover making the area open and exposed. There are also regular levels of disturbance as the site is used as a motor racing track. However, the river corridor alongside the Afon Teifi provides connectivity to the wider countryside including areas of woodland. The species will be considered further in this report.

OTTER

- 3.3.6. The desk study returned one otter *Lutra lutra* record within 2km of the site, namely an otter spraint, on tree roots located approximately 430m from the site. There were no other records of otter within 2km of the site.

- 3.3.7. Suitable habitat for otters was present along the north and south banks of the Afon Teifi. Potential holt locations are available within tree roots and rocks along the river embankments. Fish recorded within the river would provide food for otters.
- 3.3.8. One fresh otter spraint was identified approximately 50m to the east of the site on a rock protruding from the river at TN1. It is therefore confirmed that otters are using the site. The species will be considered further in this report.

BIRDS

- 3.3.9. The desk study returned eight bird species within 2km of the site; these are listed in Appendix B. The closest of which was a pied wagtail *Motacilla alba* recorded approximately 460m from the site.
- 3.3.10. The site was suitable for nesting birds with 15 incidental bird species recorded during the Extended Phase 1 habitat survey and listed in Appendix F. Habitats within the site are suitable for foraging and nesting bird species. The riparian and river habitat is suitable for nesting birds including dipper *Cinclus cinclus* and pied wagtail, which was recorded during the site visit. The site is also suitable for kingfisher *Alcedo atthis* and sand martin *Riparia riparia*. Pockets of woodland on site with mature trees and semi-improved grasslands provide suitable nesting opportunities for ground nesting birds. The species will be considered further in this report.

REPTILES

- 3.3.11. The desk study returned no records of reptile species within 2km of the site. The site contained a mosaic of habitats for foraging, basking and breeding reptiles. Areas of dry stone wall (TN2) and log piles (TN3) may provide suitable hibernacula. Steep embankments and spoil heaps were considered suitable for basking reptiles. Tussocky grasslands and thatched swards also provide sheltered resting areas. The species will be considered further in this report.

FISH

- 3.3.12. The desk study returned no records of fish.
- 3.3.13. The Afon Teifi is designated for brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, Atlantic salmon and bullhead *Cottus gobio*.
- 3.3.14. The Afon Teifi within the site contained a mixture of habitat and substrate types including gravels and stoney substrates as well as fast and slow flowing areas creating a variety of microhabitats suitable for numerous fish species at different life stages. The species will be considered further in this report.

INVERTEBRATES

- 3.3.15. The desk study returned 18 notable species of moth within 2km of the site, these are listed in Appendix B. The closest of which was a buff ermine *Spilarctia luteum* and a white ermine *Spilosoma lubricipeda* recorded approximately 640m from the site.
- 3.3.16. The site contained habitats suitable for invertebrates, including areas of bare ground and peat, riparian habitats and mature trees. The species group will be considered further in this report.

FLORA AND LOWER PLANTS

- 3.3.17. The desk study returned no records of notable or protected plants within 2km of the site.
- 3.3.18. The desk study also returned no records of non-native invasive species of plant listed on Schedule 9 of the WCA. Furthermore, no non-native invasive species were recorded on site during the PEA, which was conducted during the optimum time of year for detecting invasive species and they will not be considered further in this report.
- 3.3.19. Previous surveys conducted at the Site (Chambers and Forster Brown, 2016 and Sam Bosanquet, 2016) highlighted nationally significant assemblages of bryophytes and lichens including the species listed below:
- *Rhozocarpon cinerovirens*;
 - *Sarcosgium campestre*;
 - *Lecanora stenopropa*;
 - *Placopsis lambii*;
 - *Bryum argenteum*;
 - *Bryum capillare*;

- *Bryum argenteum*;
- *Tortula muralis*;
- *Polytrichum piliferum*;
- *Pogonatum aloides*;
- *Grimmia donniana*;
- *Diplophyllum albicans*;
- *Ditrichum lineare*;
- *Dicranum scarpium*; and
- *Schistidium apocarpum*

- 3.3.20. Woodlands within the site contained some ancient woodland indicator species including; bluebell, pignut, lesser celandine, foxglove and sessile oak.
- 3.3.21. Semi-improved acid grassland was also recorded on site, with acid indicator species including; sheep's sorrel, heather, purple moor-grass, bilberry, tormentil and heath bedstraw.

SCOPED OUT

- 3.3.22. The site was considered unsuitable for supporting the following species owing to limited habitat and an absence of records within 2km of the site:
- Hazel dormouse *Muscardinus avellanarius*;
 - Great crested newt *Triturus cristatus*;
 - White clawed crayfish *Austropotamobius pallipes*; and
 - Water vole *Arvicola amphibius*.
- 3.3.23. These species are not considered further in this report.
- 3.3.24. No other protected or notable species were observed during the survey.

4 DISCUSSION AND RECOMMENDATIONS

- 4.1.1. This section considers the potential for effects on designated sites, legally protected species, notable species and notable habitats as a consequence of the remediation works. Where further surveys or detailed assessment of potential effects are required in order to design suitable mitigation and support the remediation works, this is identified.
- 4.1.2. At this early stage, limited information is known in regard to scale of works proposed however, the current recommendations are based upon the disturbance and temporary loss of habitat during the works, including the retention and protection of semi-mature and mature trees throughout the site. An initial assessment with regards the potential ecological impacts associated with the works is provided below. This may need to be revised as more information becomes available.

4.2 STATUTORY DESIGNATED SITES

- 4.2.1. The Habitats Regulations provide strict protection to sites of European and/or international importance. This includes requiring projects or plans to be screened for likely significant effects upon SPA, SAC and candidate SACs (cSACs). Guidance also requires that potential SPAs (pSPAs) and Ramsars are subject to the same assessment.
- 4.2.2. The remediation works aims to improve the condition of the Afon Teifi SAC, restoring it to favourable quality under the WFD. It is therefore envisaged that no significant effects will result and the remediation works will have a positive effect on the conservation of the SAC. The remediation works may result in short-term impacts to the Afon Teifi and it is recommended that the remediation works area is screened by the Local Planning Authority to determine whether significant effects are likely to result. If the local authority is unable to conclude that significant effects are not likely, the remediation works area must be subject to additional assessment in accordance with the Habitats Regulations.
- 4.2.3. SSSIs are subject to strict protection under the WCA 1981 (as amended). This requires landowners to maintain these sites in favourable condition and works within these sites are managed by the appropriate national statutory body via the consent process. Certain operations within SSSIs require consent; these are specific to each SSSI. The remediation works may result in short-term impacts (such as impacts from construction of drainage works and treatment area) to the Afon Teifi SSSI; therefore, a Section 28 assent must be obtained before works commence and suitable mitigation measures agreed. Recommendations for potential ecological enhancements are provided within Section 4.6.
- 4.2.4. No negative impacts are envisaged on all other designated sites identified in Section 3.2 of this PEA. The reasons for this are that the nature of the works is to improve the condition of the Afon Teifi SSSI, restoring it to favourable quality under the WFD.
- 4.2.5. Based on the findings of the PEA mitigation and further surveys will be required; therefore, recommendations have been made within Section 4.5 and 4.6.

4.3 HABITATS

- 4.3.1. A number of habitats were identified as Habitats of Principal Importance (HPI) in accordance with Section 7 of the Environment (Wales) Act 2016. Under Section 7 of this legislation every public body (including planning authorities) must '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'.
- 4.3.2. Habitats within the site that are priority habitats within Section 7 of the Environment (Wales) Act 2016 are listed below:
- Semi-improved acid grassland;
 - Purple moor grass and rush pasture;
 - Semi-natural broadleaved woodland;
 - Rivers;
 - Inland rock and outcrop and scree habitat; and

- Open mosaic habitat on previously developed land⁵.

4.3.3. Whilst there is no specific legal protection of these habitats, there is a presumption against development that would result in a loss of priority habitats. In order to comply with planning policy, the remediation works would need to demonstrate that there would be no significant loss of this habitat as a result of the works. Therefore, if any of the above priority habitats are to be lost, replacement habitat commensurate with that lost should be provided within the design.

4.4 PROTECTED AND NOTABLE SPECIES

4.4.1. The results of the desk study, Extended Phase 1 habitat survey and protected species assessment highlighted suitable habitat for supporting protected species or species of conservation concern within the site, or within the immediate surroundings of the site. These include bats, birds, badgers, otters, reptiles, fish, invertebrates and lower plants. The legal protection afforded to these species is outlined below and, where appropriate, the requirement for further survey and/or mitigation measures is identified.

BATS

4.4.2. All species of bats recorded within the UK are protected from killing, injury and disturbance⁶ and their roosts protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

4.4.3. Certain species of bats, including the Barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteini*, greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe *Rhinolophus hipposideros*, noctule *Nyctalus noctula*, brown long eared *Plecotus auritus*, common pipistrelle and soprano pipistrelle *Pipistrellus pygmaeus* are also listed as Species of Principal Importance (SPI) for the conservation of biodiversity in Wales in accordance with Section 7 of the Environment (Wales) Act 2016.

4.4.4. Suitable habitat were recorded for foraging, commuting, roosting (potentially including hibernation) and swarming bats within the site. Several trees were identified as having potential to support bat roosts, however semi-mature and mature trees will be retained and protected within the remediation works area.

4.4.5. No tree roosts of linear features will be lost during the remediation works therefore no transect surveys are required for bats. Due to the likelihood that the remediation works will not incur any significant habitat loss and that disturbance to the site is only temporary (excluding works to the mine itself, see below) it is considered appropriate that works will be carried out under a Precautionary Method of Working and Ecological Clerk of Works (ECoW).

4.4.6. Mine shafts associated with Abbey Consols Mine are located outside the site boundary to the north. Targeted bat survey were undertaken in these areas⁷

4.4.7. It is recommended that no lighting is used during the works and that no night time works are carried out. If lighting is required then there will need to be consideration of potential impacts on bats from lighting requirements during the construction phase of the remediation works.

BADGER

4.4.8. The Protection of Badgers Act 1992 makes it illegal to wilfully kill, injure or take any badger, or attempt to do so. It also makes it an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

⁵ Some of the above mentioned HPI's overlap. Scree and acid grassland is contained within the open mosaic habitat on previously developed land.

⁶ Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

⁷ NRW (2018) Interim Ecological Appraisal Report: Abbey Consols Mines Pontrhydfendigaid Ceredigion.

- 4.4.9. Tunnels suitable for supporting badger were identified on site during the Extended Phase 1 habitat survey. One of the tunnels is shown in photograph 6 of Appendix G.
- 4.4.10. A badger survey is recommended which will include a check of the site prior to the license application to make sure the sett is still active.
- 4.4.11. If badgers are confirmed to be using the sett, a buffer area will be fixed around the sett to avoid disturbance, if direct damage to the sett is unavoidable then it will be necessary to close the sett prior to commencement of construction, under licence from NRW. Development licences are typically only issued for activities affecting setts to occur between July and November inclusive, in order to avoid the badger breeding season. To obtain a licence a suitable mitigation strategy must be in place.

OTTER

- 4.4.12. The European otter is protected from killing, injury and disturbance⁸ and its place of rest or shelter (holt) is protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these sites. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.
- 4.4.13. Otters are also listed as a Species of Principal Importance (SPI) in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.
- 4.4.14. The Afon Teifi SAC is designated for otters and during the Extended Phase 1 habitat survey an otter spraint was recorded, thereby confirming presence. Otters are likely to be using the site for foraging and possibly resting. A detailed otter survey is recommended, extending up to 200m upstream and downstream of the site to account for disturbance. Timings of surveys should take into account recent weather conditions (i.e. otter surveys should be carried out after periods of heavy rain).
- 4.4.15. Should otters be impacted upon as a result of the remediation works a European Protected Species (EPS) licence may be required in order to undertake the works in accordance with the relevant legislation.

BIRDS

- 4.4.16. The Habitat Regulations 2017 Part 1 Regulation 10(2) & (3) state that local authorities '*must take such steps in the exercise of their functions as they consider appropriate to contribute to...the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK including by means of the upkeep, management and creation of such habitat...*'. The legislation continues to state that economic and recreation requirements must be taken into consideration in considering which measures are appropriate.
- 4.4.17. Under the WCA 1981 (as amended) all wild birds are protected from killing and injury, and their nests and eggs protected from taking, damage and destruction whilst in use. Additional protection is extended to species listed under Schedule 1 of the Act, meaning it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.
- 4.4.18. The site contained a range of habitats with suitability for supporting breeding birds. It is recommended that any required vegetation clearance takes place outside of the breeding bird season (considered March to August inclusive) to avoid disturbance/destruction of any active nests. Where it is not possible to clear vegetation outside of the breeding bird season, vegetation suitable to support nesting birds that will be affected by the works will be checked by an ecologist no more than 24 hours prior to commencement of the works. Any nesting birds identified must be left to fledge before works can commence. Should nesting birds be identified, safe working distances will be determined by an ecologist.

⁸ Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

REPTILES

- 4.4.19. Common reptile species (common or viviparous lizard *Zootoca vivipara*, adder *Vipera berus*, grass snake *Natrix natrix* and slow worm *Anguis fragilis*) are partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This includes protection from killing and injury.
- 4.4.20. All reptile species are also listed as SPI in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.
- 4.4.21. The site was considered suitable to support common reptile species. Due to the likelihood that the remediation works will not incur any significant habitat loss and that disturbance to the site is only temporary it is considered appropriate that works will be carried out under a Precautionary Method of Working and Ecological Clerk of Works (ECoW). If vegetation clearance is undertaken in the active season then this would include two-staged cut in a single direction (towards the nearest area of retained vegetation) allowing individual reptiles to move from the area naturally. The first cut will be to 150mm, to make the site unsuitable for reptiles, completed by personnel with brush cutters/hand-propelled rotary flail mowers. The cut will be carried out when daytime temperatures exceed 14°C in line with good practice. The cut areas will then be left for a minimum of 24 hours with minimum night temperatures of 5°C. Following this period vegetation will be cut to ground level.
- 4.4.22. The suitable hibernacula features must not be dismantled during hibernation season as this would disturb and potentially kill any hibernating reptiles. The hibernacula must be left undisturbed until reptiles become active in spring, and then dismantled under ecological supervision.
- 4.4.23. If vegetation clearance is undertaken during the hibernation season (October to March inclusive), vegetation clearance works can proceed provided that the following measures are adhered to:
- Vegetation above ground can be removed in one cut to a minimum of 150mm only and where hibernacula features are present a corridor of vegetation must be maintained to unaffected areas to allow reptiles safe passage, once they emerge from hibernation;
 - Vehicles and machinery are not driven over areas of suitable reptile habitat (scrub and grassland);
 - The suitable hibernacula features must not be dismantled during hibernation season as this would disturb and potentially kill any hibernating reptiles. The hibernacula must be left undisturbed until reptiles become active in spring, and then dismantled under ECoW supervision.
- 4.4.24. Vegetation clearance will be carried out under ecological supervision, with an ECoW overseeing the vegetation removal and confirming when habitat has been reduced to a sufficient height such that reptiles are unlikely to be present. Vegetation within the construction footprint will be retained at a height under 150mm for the duration of construction.

FISH

- 4.4.25. The Afon Teifi is designated for brook lamprey, river lamprey, Atlantic salmon and bullhead.
- 4.4.26. Once the full scope of the remediation works is available, it is recommended that potential impacts to the above mentioned species be reassessed. Should any discharge or water drainage into the Afon Teifi be required, further surveys may be necessary.
- 4.4.27. It is recommended that the remediation works area is subject to an NRW Environmental Action Plan to prevent impacts resulting from pollution and disturbance.

INVERTEBRATES

- 4.4.28. The desk study returned 18 notable species of moth within 2km of the site. The closest of which was a buff ermine and a white ermine recorded approximately 640m from the site. The site also contained habitats suitable for supporting invertebrate populations.
- 4.4.29. Due to the likelihood that the remediation works will not incur any significant habitat loss and that disturbance to the site is only temporary, it is considered appropriate that works will be carried out under a Precautionary Method of Working and ECoW.
- 4.4.30. Enhancements are provided in Section 4.6 to improve the site for invertebrates.

FLORA AND LOWER PLANTS

- 4.4.31. Previous surveys conducted at the site (Chambers and Forster Brown, 2016 and Sam Bosanquet, 2016) highlighted nationally significant assemblages of bryophytes and lichens. A survey by Sam Bosanquet (2016) mapped the locations of these bryophytes and lichens.
- 4.4.32. However, given that the most recent survey is now nearly out of date an updated survey will be required to identify and locate areas of the nationally significant bryophytes and lichens.
- 4.4.33. In the likely instance that the metalophile bryophytes and lichens are still present on site a Mitigation Strategy will be required to retain the nationally significant assemblage following treatment of the heavy metals.

FURTHER SURVEY REQUIREMENTS

Potential ecological constraints for which further surveys are required to ensure legal and planning policy compliance are listed in Table 2 below.

Table 2 - Key Ecological Constraints, Further Survey Requirements and Recommendations

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
Bats	<p>Covering and sealing of entrances to the mine shafts if required.</p> <p>Potential disturbance by construction phase i.e. lighting river.</p>	<p>Hibernation surveys, including a systematic inspection of the mine by a licensed ecologist for hibernating bats a minimum of two visits, to take place between December to February with at least one in mid-January and one in mid-February.</p> <p>This will be complemented with deployment of a static detector(s) left for a minimum of two weeks in each month from December to February within the mine.</p> <p>Swarming surveys are also required. Including the deployment of a static detector outside or just within the entrance to the mine left for at least five nights between mid-August and the end of October.</p> <p>Work under a Precautionary Method of Working and ECoW to ensure trees are not damaged or disturbed and that lighting does not affect bats.</p>	<p>Swarming survey carried out in August - October inclusive.</p> <p>Hibernation Surveys carried out November - February inclusive.</p>
Badger	<p>Capping works in spoil heaps may result in destruction of a badger sett.</p>	<p>A badger survey including an updated survey prior to license application to confirm the sett is still active.</p>	<p>Badgers are less active during the winter periods and often spend most of their time around their main sett during this time. The tunnels identified on site are unlikely to be a main sett therefore survey work should be conducted between May - October.</p>
Otter	<p>Disturbance to the river and riparian zone.</p> <p>Damage or disturbance to resting places or potential holts.</p>	<p>A full otter survey of all the watercourses on site including 200m upstream and downstream of the site, comprising three visits within different seasons of the year.</p>	<p>Signs are less visible after periods of heavy rainfall and/or flooding therefore surveys immediately after these weather conditions should be avoided.</p>

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
Birds	<p>Potential damage or disturbance to river embankment and inland cliff may result in the removal of nesting sites or opportunities for kingfisher and sand martin.</p> <p>Removal of suitable vegetation for nesting birds.</p>	<p>Work under Precautionary Method of Working and ECoW to include measures for ground nesting birds.</p> <p>Retention and protection of river cliff within the remediation works area is recommended. If this is not possible further survey for kingfishers may be required.</p>	Vegetation removal should not occur from March to August in order to avoid breeding/ nesting birds. An ECoW will be required if vegetation removal is required during these months.
Reptiles	Temporary loss of habitat.	Work under Precautionary Method of Working and ECoW, this will include two-stage vegetation clearance to make the site unsuitable for reptiles.	N/A
Invertebrates	Potential construction works to the treatment areas may degrade or remove habitat for invertebrates.	Work under Precautionary Method of Working and ECoW.	N/A
Fish	Construction work may results in the degradation and disturbance of the river channel for fish and other aquatic species	Fish surveys if works results in degradation and disturbance of the river channel.	Consideration needs to be given to species' breeding cycle and migration patterns and will be updated once timeframes are confirmed.
Plants	Potential loss of nationally significant assemblages of bryophytes and lichens through direct impacts and through the remediation works creating unsuitable habitats for the bryophytes and lichens.	Bryophyte and lichen survey and mapping.	N/A

4.5 PRELIMINARY AVOIDANCE, MITIGATION AND COMPENSATION MEASURES

4.5.1. To enable compliance with relevant legislation and planning policy, as described above within Section 4.2, 4.3 and 4.4 the following avoidance, mitigation and compensation measures should be incorporated in the remediation works design. These will be refined following completion of further survey recommended in Table 2 above. This is subject to change pending receipt of the full scope of the remediation works.

- Avoid the removal of mature and semi-mature trees and dense scrub in order to avoid disturbance or damage to bat roosts and nesting sites for birds;
- Where possible, avoid removal of Habitats of Principal Importance. Where this is not possible, provision of replacement habitat, over and above that which is lost, would be required within the remediation works area to ensure net-gain of biodiversity;
- Retention and protection of inland river cliff; and
- During construction works, contractors are to work under Ecological Supervision and under Precautionary Methods of Working.

ENVIRONMENTAL BEST PRACTICE

4.5.2. In addition, general environmental protection measures must be implemented during the construction phase of the remediation works. Such measures include best environmental practice guidance outlined in the Environment Agency's Pollution Prevention Advice and Guidance (Environment Agency, 2007) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2015). The following minimum standards must be adhered to prevent ecological impacts beyond the site boundary:

- Measures must be taken to prevent dust and other emissions from construction affecting land beyond the site;
- Chemicals and fuels must be stored in secure containers located away from watercourses or water bodies. Spill kits must be available;
- Excavations must be covered or securely fenced (with no potential access points beneath fencing) when the site is closed (e.g. overnight) to prevent entrapment of animals;
- Retained trees must be protected in accordance with BS5837;
- Noise and vibration must be controlled and kept to the minimum necessary; and
- Lighting used for construction must be switched-off when not in use and positioned so as not to spill on to adjacent land or retained vegetation within the site.

4.6 ECOLOGICAL ENHANCEMENT OPPORTUNITIES

4.6.1. Planning Policy Wales (2012) states that development plans should 'provide for the conservation of and where appropriate, enhancement of biodiversity...identifying opportunities to conserve important local habitats and species'.

4.6.2. One of the seven goals of the Well-being of Future Generations (Wales) Act (2015) is to create a resilient Wales. This comprises maintaining and enhancing "a biodiverse natural environment with healthy functioning ecosystems that support...ecological resilience."

4.6.3. At a local level the Ceredigion Local Development Plan states that 'Development will be permitted where it protects and, where possible, enhances biodiversity, geodiversity and ecological connectivity across Ceredigion, including local sites and local priority species and habitats. Where it is appropriate to the scale and location of the development and opportunities exist, development should incorporate nature conservation education and access, providing the site's ecological or geological integrity can be safeguarded.'

4.6.4. To encourage compliance with planning policy the following measures are recommended for inclusion within the remediation works design, where possible:

- Reopening the Abbey Consols adit entrance would create additional roosting opportunities for bats including hibernation sites;
- Provision of bird and bat boxes on retained trees;
- Provision of invertebrate hotels, habitat piles;
- Avoid herbicide/pesticide use;

- Natural regeneration using topsoil from the site containing seed bank (using soil salvage and storage techniques to be identified in a Mitigation Strategy) as well as separation of top soil based on grassland type (acid grassland stored separately from neutral grassland);
- Good horticultural practice (e.g. the use of peat-free composts, mulches and soil conditioners, native plants of local provenance) to be implemented for any new planting proposed.
- A low intensity management program should be implemented as part of the Site Management Plan to provide improved habitat for reptiles and invertebrates. This should include light grazing to allow the grass to grow long but without scrub taking over. This management program should only be implemented to the south of the site to avoid conflict with archaeological interests on the site.

5 CONCLUSIONS

- 5.1.1. The remediation works are likely to impact upon protected and/or notable species and habitats due to the temporary removal of some of the habitats on site and the permanent changes to the substrate composition resulting in the removal of heavy metals from the substrate.
- 5.1.2. The Afon Teifi will be affected by the remediation works due to the permanent removal of heavy metals leaching into the water course, however, this is perceived to be a positive impact. The Afon Teifi may also be affected due to the temporary disturbance of the embankments and watercourse during the construction phase. Further assessment including the screening for a HRA is required prior to the remediation works commencing.
- 5.1.3. Once the full scope of the remediation works is known, impacts on HPIs will need to be assessed and suitable mitigation designed.
- 5.1.4. Habitats are present within the site that have the potential to support a range of protected or notable species. These include badger, otter, breeding birds, reptiles, invertebrates, fish and lower plants. Further surveys for bats, badger, otters, fish, and lower plants are required, depending on how the remediation works progress.
- 5.1.5. Preliminary avoidance and/or mitigation measures are recommended for breeding birds, reptiles, and invertebrates in the form of protection/retention, ecological supervision and Precautionary Methods of Working.
- 5.1.6. Results of the surveys recommended as part of this assessment will inform the need for any further licensing and/or mitigation requirements and help inform the detailed design of the proposals in line with national and local planning policy and ecological legislation.

6 REFERENCES

PROJECT REFERENCES

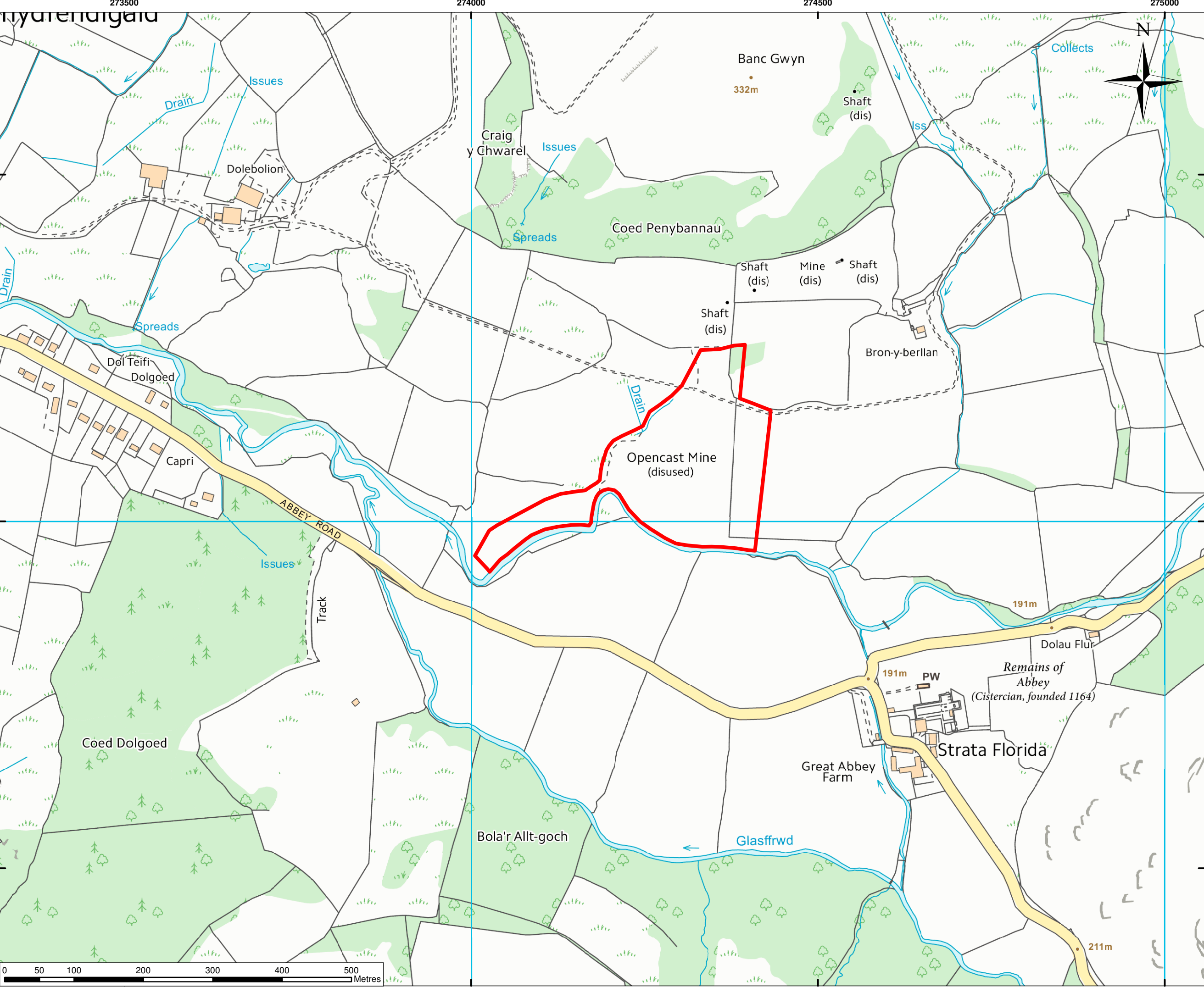
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FIGURES



KEY

Abbey Consols - Site Area

Overview Map

A		IW 16/05/2018	RC 16/05/2018	TE 16/05/2018
Ver	Amendments	Originated by and date	Checked by and date	Approved by and date

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Client :

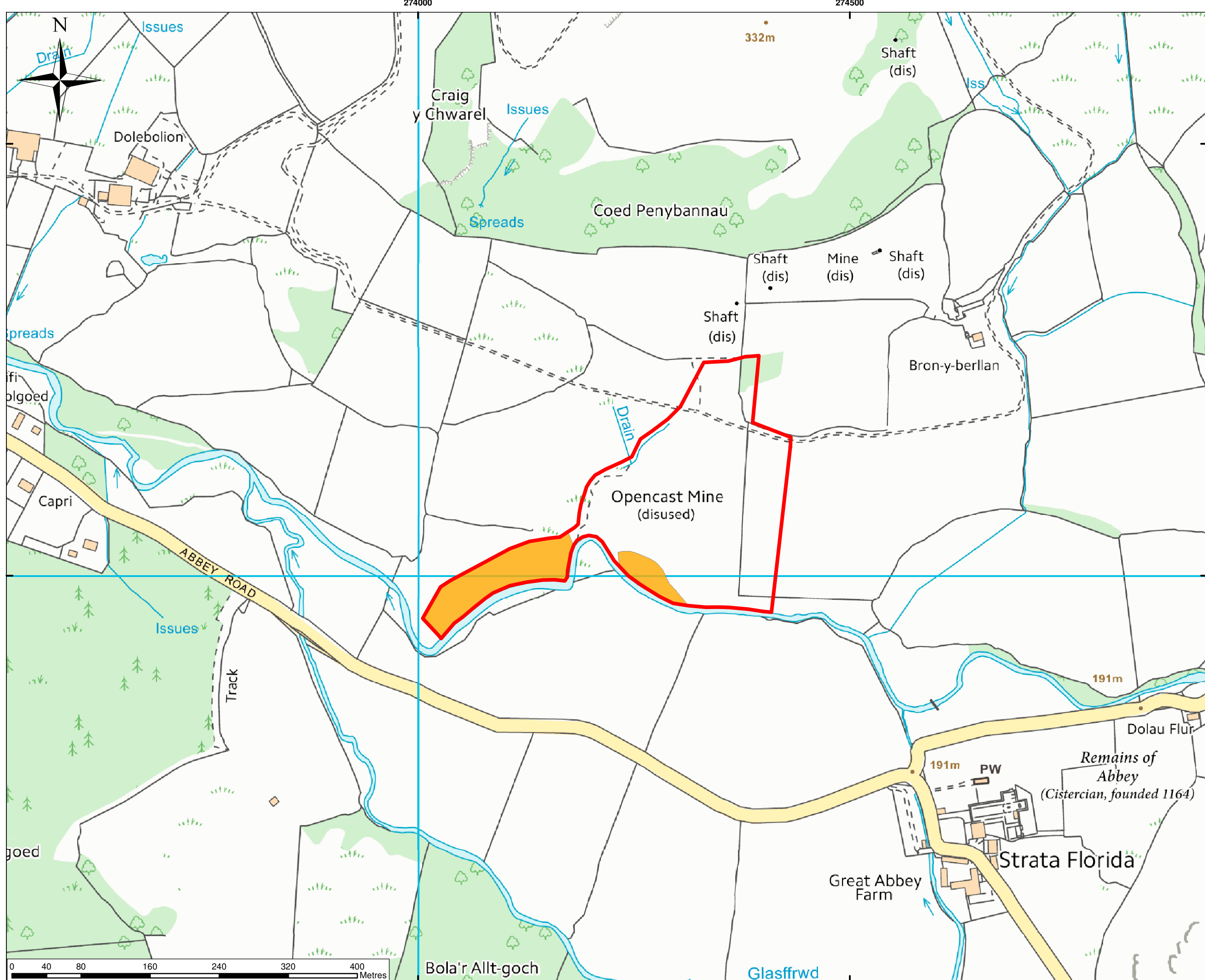
Project :
**Abbey Consols Metal Mine
Remediation Project
(Blowout Potential Assessment)**

Drawing Title :
Site Location Plan

Drawing No :
Figure 01

Scale @ A3 :
1:5,000

Purpose :
Information



KEY

Abbey Consols - Site Area

Approximate Extent of Treatment Areas

Overview Map

A		IW 26/06/2018	RC 26/06/2018	TE 26/06/2018
Ver	Amendments	Originated by and date	Checked by and date	Approved by and date

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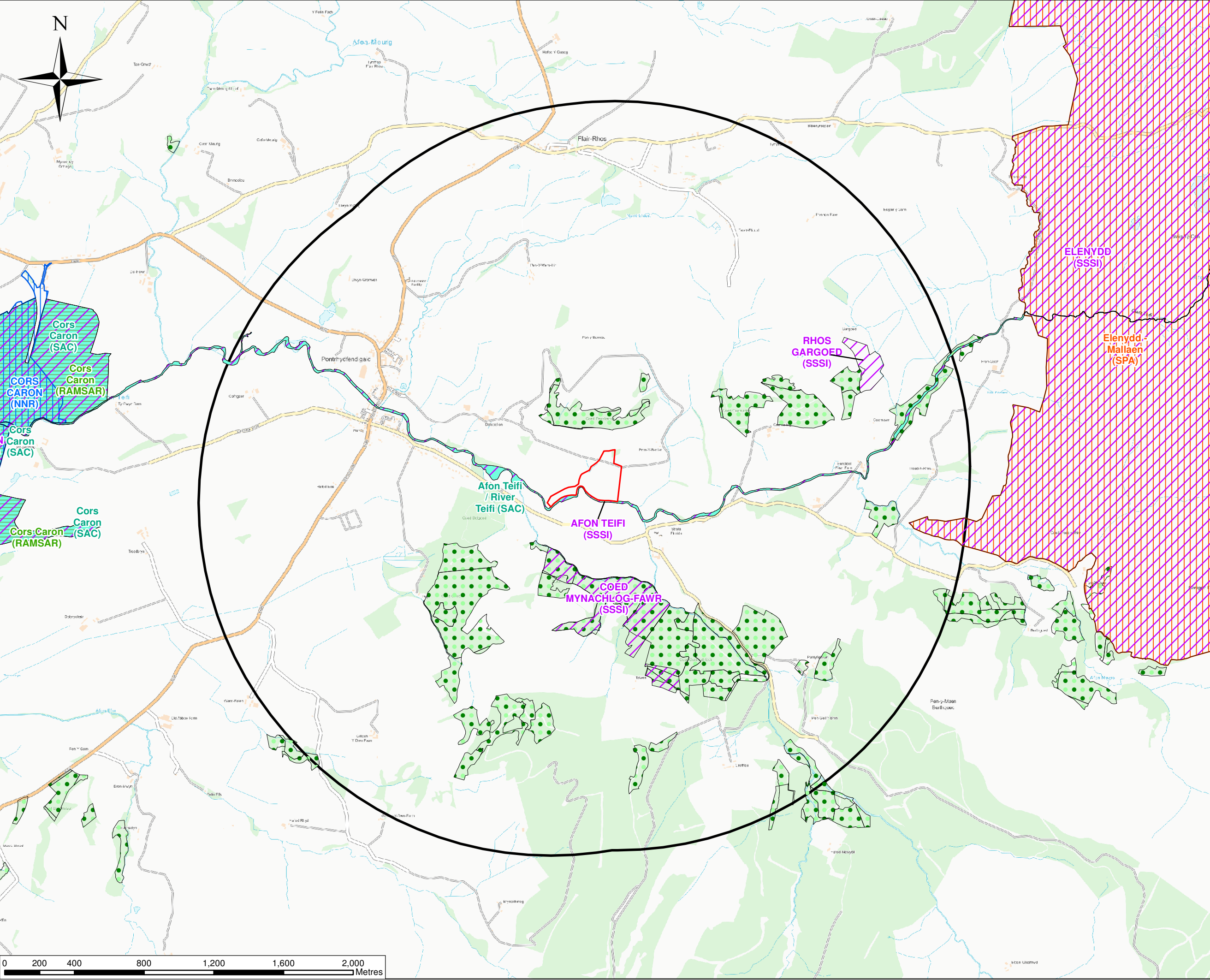
Project :
Abbey Consols Metal Mine Remediation Project (Blowout Potential Assessment)

Drawing Title :
Treatment Works Extents

Drawing No :
Figure 02

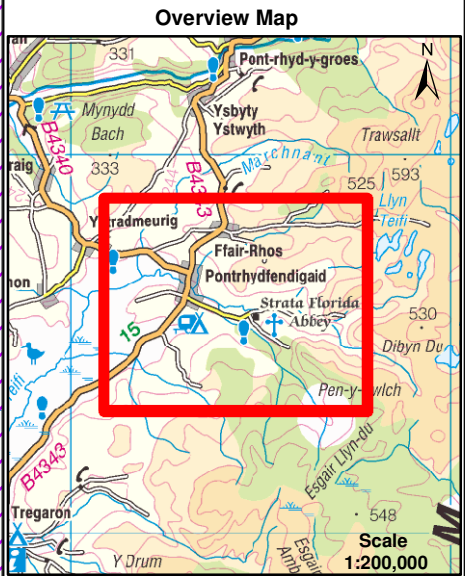
Scale @ A3 :
1:4,000

Purpose :
Information



KEY

- Site Boundary
- 2KM Site Buffer
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserves (NNR)
- RAMSAR
- Special Protection Areas (SPA)
- Ancient Woodland
- Special Areas of Conservation (SAC)



A		IW 26/06/2018	RG 26/06/2018	TE 26/06/2018
Ver	Amendments	Originated by and date	Checked by and date	Approved by and date
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wsp

Client : Cyfoeth Naturiol Cymru Natural Resources Wales

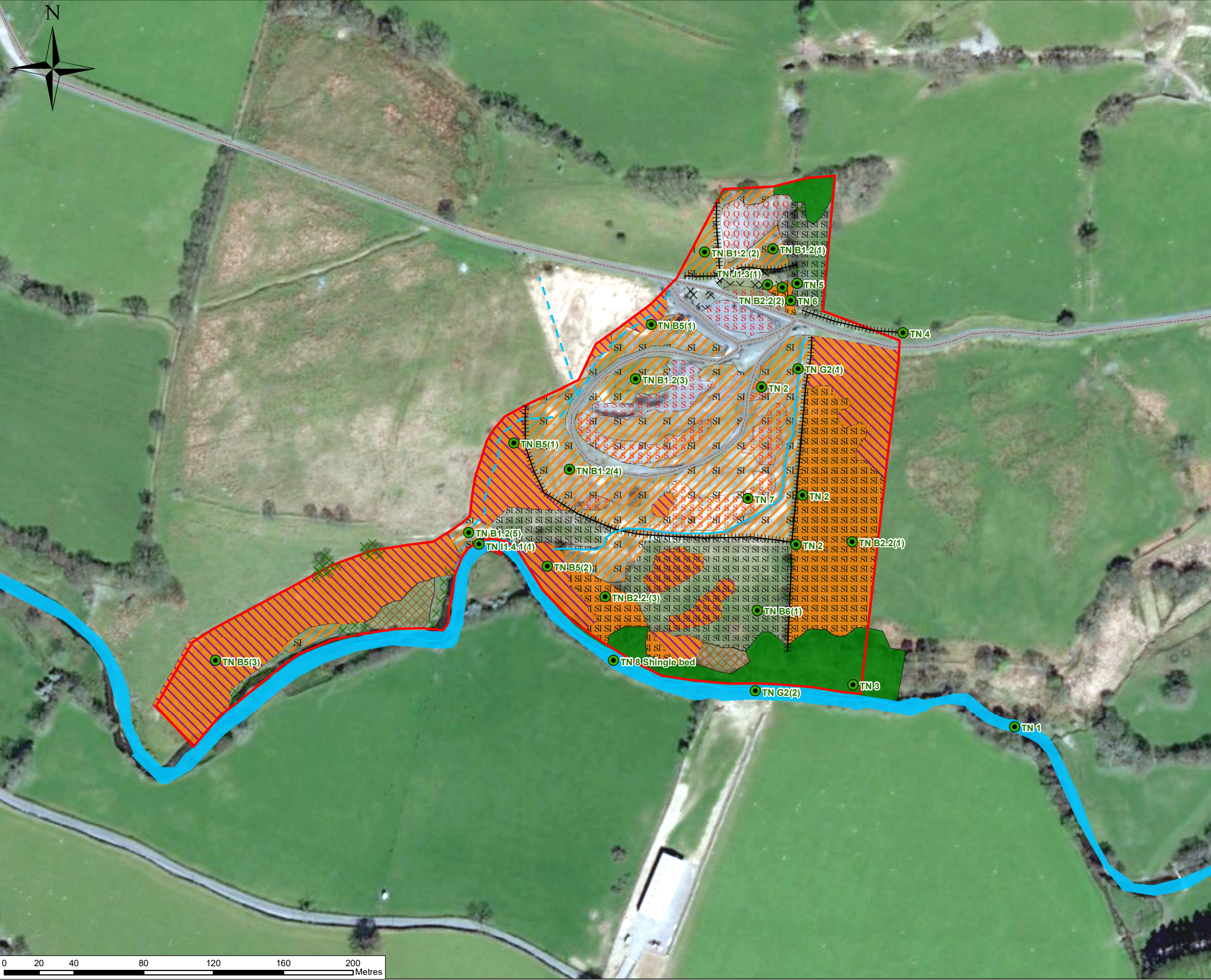
Project : Abbey Consols Metal Mine Remediation Project (Blowout Potential Assessment)

Drawing Title : Designated Sites

Drawing No : Figure 3

Scale @ A3 : 1:20,000

Purpose : Information



KEY

Abbey Consols - Site Area

Phase 1 Habitat Classification

A.1.1.1 : Broadleaved woodland - semi-natural

B.5 : Marsh/marshy grassland

B.6 : Poor semi-improved grassland

B1.2 : Acid grassland - semi-improved

B2.2 : Neutral grassland - semi-improved

C1.2 : Bracken - scattered

I2.1 : Quarry

I2.2 : Spoil

I1.4.1 : Rock exposure & waste other exposure - acid/neutral

J1.3 : Cultivated/disturbed land - ephemeral/short perennial

J 2.6 : Dry ditch

G2: Running water

J 2.4: Fence

Hard standing

A2.2 : Scrub - scattered

Target notes (TN)

A		IW 27/06/2018	GH 27/06/2018	
Ver	Amendments	Originated by and date	Checked by and date	Approved by and date
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wsp

Client :

Project :
Abbey Consols Metal Mine
Remediation Project
(Blowout Potential Assessment)

Drawing Title :
Phase 1 Habitat Survey Map

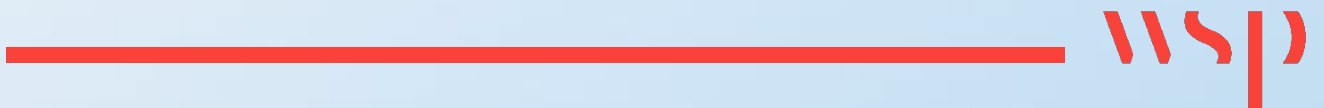
Drawing No :
Figure 4

Scale @ A3 :
1:2,000

Purpose :
Information

Appendix A

RELEVANT LEGISLATION AND
PLANNING POLICY



ENGLAND & WALES LEGISLATION AND POLICY CONTEXT

This report has been compiled with reference to relevant wildlife legislation, planning policy and the UK Biodiversity Framework. An overview and context of relevant legislation is provided, with the relevant protection each species groups or species receives summarised in Table 1.

The Wildlife and Countryside Act 1981, (as amended) (WCA)

Protected birds, animals and plants are listed under Schedules 1, 5, 8 and 9 respectively of the WCA, a description of these Schedules and their meaning is provided below.

Under the WCA (England and Wales) all birds, their nests and eggs (with exception of species listed under Schedule 2) are protected by the WCA. It is an offence to:

- Intentionally kill, injure, or take any wild bird,
- Take or destroy an egg of any wild bird.
- Damage or destroy the nest of any wild bird (whilst being built, or in use). Under the WCA the clearance of vegetation within the Site boundary, or immediately adjacent to the Site during the bird nesting season could result in an offence occurring by the disruption or destruction of nest sites. The bird breeding season can be taken to occur between March - August inclusive, although is subject to variations based on species, geographical and seasonal factors.

Schedule 1

Birds listed under Schedule 1 of the WCA⁹ are afforded additional protection with regard to intentional or reckless disturbance whilst nest-building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Schedule 5

Species listed in Schedule 5 can either be fully protected or be partially protected under Section 9, which makes it unlawful to intentionally:

- Part 1: kill, injure or take;
- Part 2: possess or control (live or dead animal, part or derivative);
- Part 4 (a): damage or destruct any structure used for shelter or protection;
- Part 4 (b): disturb them in a place of shelter or protection;
- Part 4 (c): obstruct access to place of shelter or protection;
- Part 5 (a): sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative);
- Part 5 (b): advertise for buying or selling.

Schedule 8

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

Schedule 9

Invasive species listed under Schedule 9 are prohibited from release into the wild and the Act prohibits planting or “causing to grow” in the wild of any plant species listed in Schedule 9. It should be noted that certain bird species listed on Schedule 1 of the WCA are also listed on Schedule 9 to prevent release of non-native and captive individuals, this includes barn owl, red kite, goshawk and corncrake.

Countryside Rights of Way Act 2000 (CRoW Act)

The CRoW Act has amended the WCA in England and Wales strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and the legal protection for threatened species. It adds the word ‘reckless’ to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.

The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 (<http://www.legislation.gov.uk/anaw/2016/3/contents/enacted>) puts in place the legislation needed to plan and manage Wales’ natural resources in a more proactive, sustainable and cohesive way. Section 7 replaces the duty in Section 42 of the NERC Act 2006 and it places a duty on the Welsh Ministers to publish, review and revise lists of living organisms and types of habitats which they consider are of key significance to sustain and improve biodiversity in Wales. The species and habitat lists are identical to those in Section 42 but it should be noted it is currently under review (23.03.2017).

The Protection of Badgers Act (1992)

It is an offence to wilfully take, kill, injure, possess or ill-treat a badger. Under the Act their setts are protected against intentional or reckless interference. Sett interference includes damaging or destroying a sett, obstructing access to any part of the sett, or disturbance of a badger whilst it is occupying a sett. The Act defines a badger sett as ‘any structure or place, which displays signs indicating the current use by a badger’ and Natural England (NE) takes this definition to include seasonally used setts that are not occupied but that show sign of recent use by badgers (Natural England, 2009¹⁰).

If impacts to badgers or their setts are unavoidable then authorised sett disturbance requires a licence.

⁹ To view the current list of Schedule 1 listed birds visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/1> [Accessed 18.06.2018].

¹⁰ Natural England, June 2009, Protection of Badgers Act 1992 (as amended), Guidance on ‘Current Use’ in the definition of a Badger Sett WMLG17, Natural England, Peterborough.

The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012)

This Framework lists the UK's most threatened species and habitats and sets out targets and objectives for their management and recovery. The UK Biodiversity Action Plan (BAP) process is delivered nationally, regionally and locally and should be used as a guide for decision-makers to have regards for the targets set by the framework and the goals they aim to achieve. The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant (UK Post-2010 Biodiversity Framework, 2012¹¹).

The Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations came into force on 30th November 2017, and extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters). In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland.

All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations it is unlawful to:

- Deliberately kill, capture or disturb;
- Deliberately take or destroy the eggs of; and
- Damage or destroy the breeding site/resting place of any species protected under this legislation.

If the Ecologist determines that impacts to an EPS are unavoidable then the works may need to be carried out under a site specific mitigation licence from Natural England (NE) or Natural Resources Wales (NRW). Low Impact Class licences are also available in both England and Wales for bats and great crested newts. This enables Registered Low Impact Consultants to undertake certain low impact activities reducing the EPS application paperwork and process length.

Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation. This means these species are a relevant consideration in a Habitats Regulations Assessment (HRA).

The Birds Directive seeks to maintain populations of all wild bird species across their natural range (Article 2). All bird species listed under Annex I¹² of the Birds Directive are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs), these are also designated under all regularly occurring migratory species, with regard to the protection of wetlands of international importance (Article 4). This means these bird species and communities are a relevant consideration in HRA.

¹¹ JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), July 2012, UK Post-2010 Biodiversity Framework, Available from: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf [Accessed 18.06.2018].

¹² To view birds listed under Annex I visit: http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm [accessed 18.06.2018]

Table A:1: Key Species and National Wildlife Legislation, Policy and Biodiversity Framework Applicable in England & Wales

Species	Legislation, Planning Policy and UK Biodiversity Framework							
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of /Habitats and Species Regulations 2010 (as amended) (Habitats Regulations) - Regulation 41	Natural Environment and Rural Communities (NERC) Act 2006 / The Environment(Wales) Act (2016)	The Protection of Badgers Act 1992	The UK Post-2010 Biodiversity Framework 2011-2020 (JNCC and DEFRA, 2012)
	Schedule1	Schedule 5	Schedule 8	Schedule 9	European Protected Species (Annex IV of the EC Habitats Directive),			
Badger							<input type="checkbox"/>	
Bats		<input type="checkbox"/> ¹³ (part)			<input type="checkbox"/> ¹⁴	<input type="checkbox"/> ¹⁵		<input type="checkbox"/> ¹⁶
Otter		<input type="checkbox"/> 5(part)			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Birds	<input type="checkbox"/>			<input type="checkbox"/> ¹⁷		<input type="checkbox"/> ¹⁸		<input type="checkbox"/> ¹⁹
Reptiles		<input type="checkbox"/> ²⁰ (part) <input type="checkbox"/>		<input type="checkbox"/> ⁹	<input type="checkbox"/> ²¹	<input type="checkbox"/> ²²		<input type="checkbox"/> ²³
Invertebrates		<input type="checkbox"/> ²⁴ (full/part)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> ²⁷		<input type="checkbox"/> ²⁸

¹³ These species are partially protected under section 9(4)(b), (4)(c) and (5).

¹⁴ Only Barbastelle (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteini*), greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*) are listed on Annex II of the Habitats Directive.

¹⁵ Greater horseshoe bat, lesser horseshoe bat, Bechstein's bat, noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*) and barbastelle are listed as Species of Principal Importance in England with the addition of common pipistrelle (*Pipistrellus pipistrellus*) in Wales listed under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

¹⁶ Barbastelle bat, Bechstein's bat, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat are listed as UK BAP species of bat.

¹⁷ To view plants and animals listed on Schedule 9 Part 1 visit <http://www.legislation.gov.uk/ukpga/1981/69/schedule/9> [accessed 6 April 2017]

¹⁸ There are 49 species of birds listed as Species of Principal Importance in England in Section 41 of the NERC Act 2006 and 51 species in Wales under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

¹⁹ To view the current list of UK BAP priority birds visit: <http://jncc.defra.gov.uk/page-5163> [Accessed 18.06.2018].

²⁰ The four common reptile species, Adder (*Vipera berus*), Grass snake (*Matrix natrix*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5). The rarer UK reptile species (Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*)) are partially protected under section 9(4)(b) and (c) and (5).

²¹ Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*) are the only reptiles to be designated as European Protected Species.

²² All 6 reptile species are listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 5 species, excluding smooth snake, listed under Section 7 of the Environment (Wales) Act (2016) <http://www.legislation.gov.uk/ukpga/2006/16/contents>.

²³ To view the current list of UK BAP priority herptile species visit: <http://jncc.defra.gov.uk/page-5166> [Accessed 18.06.2018].

²⁴ To view the current list of invertebrates that are protected under this Act either in part or full visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 18.06.2018].

²⁷ There are currently 379 invertebrate species (not including marine species) listed as Species of Principal Importance in England http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwivvu7J9trSAhXiCsAKHX4TBGcQFggvMAM&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F6518755878240256&usq=AFQjCNEpiUWYuOqhVcfSDvi_3iK2TJytfQ and 188 species in Wales http://www.eryri-npa.gov.uk/_data/assets/pdf_file/0003/486156/SpeciesList.pdf listed under Section 41 of the NERC Act 2006 and listed under Section 7 of the of the Environment (Wales) Act 2016. [Accessed 18.06.2018]

²⁸ To view the current list of UK BAP priority invertebrates visit: <http://jncc.defra.gov.uk/page-5169> [Accessed 18.06.2018].

Table A:1: Key Species and National Wildlife Legislation, Policy and Biodiversity Framework Applicable in England & Wales

Species	Legislation, Planning Policy and UK Biodiversity Framework							
					25 26 ,			
Fish		☐ ²⁹ (full/part)		☐ ⁹	☐ ^{30 31} ,	☐ ³²		☐ ³³
Plants			☐ ³⁴	☐ ⁹	☐ ^{35 36} ,	☐ ³⁷		☐ ³⁸

Table A 1

Table A 2: Key Species and National Wildlife Legislation, Policy and Biodiversity Framework

Species	Legislation, Planning Policy and UK Biodiversity Framework								
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of Habitats and Species Regulations 2017(Habitats Regulations)		Wildlife and Natural Environment (Scotland) Act 2011	The Protection of Badgers Act 1992	Scottish Biodiversity Strategy 2011-2020 (Scottish Government)
	Schedule 1	Schedule 5	Schedule 8	Schedule 9	European Protected Species	Annex II			
Badger							☐1	☐2	
Bats		☐3 (part)			☐				☐

²⁵ The Large blue butterfly (*Maculinea arion*), Fisher's estuarine moth (*Gortyna borelii lunata*) and Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) are the only invertebrates to be designated European Protected Species.

²⁶ There are currently twelve invertebrates listed in Annex II of the Habitats Directive; White-clawed crayfish (*Austropotamobius pallipes*), Southern damselfly (**Coenagrion mercuriale**), Marsh fritillary butterfly (**Eurodryas aurinia**), Violet click beetle (**Limoniscus violaceus**), Stag beetle (**Lucanus cervus**), Freshwater pearl mussel (**Margaritifera margaritifera**), Narrow-mouthed whorl snail (**Vertigo angustior**), Round-mouthed whorl snail (**Vertigo genesii**), Geyer's whorl snail (**Vertigo geyeri**), Desmoulin's whorl snail (**Vertigo moulinsiana**), Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) and Fisher's estuarine moth (*Gortyna borelii lunata*).

²⁹ To view the current list of fish either part or fully protected under the Act visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 18.06.2018].

³⁰ Sturgeon (*Acipenser sturio*) is the only fish to be designated a European Protected Species.

³¹ There are eight fish species listed on Annex II of the Habitats Directive. To view the current list visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 18.06.2018].

³² There are 35 species of fish listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 10 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.

³³ To view the current list of UK BAP priority fish visit: <http://jncc.defra.gov.uk/page-5164> [Accessed 18.06.2018].

³⁴ To view the current list of Schedule 8 listed plants visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/8> [Accessed 18.06.2018].

³⁵ There are nine plant species designated as European Protected Species. To view the current list visit: <http://www.legislation.gov.uk/uksi/2010/490/schedule/5/made> [Accessed 18.06.2018].

³⁶ To view the current list of plant species on Annex II of the Habitats Directive visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 18.06.2018].

³⁷ There are currently 152 vascular plants listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 77 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.³¹ To view the current list of UK BAP priority plants visit: <http://jncc.defra.gov.uk/page-5171> and <http://jncc.defra.gov.uk/page-5168> [Accessed 18.06.2018].

³⁸ To view the current list of UK BAP priority plants visit: <http://jncc.defra.gov.uk/page-5171> and <http://jncc.defra.gov.uk/page-5168> [Accessed 18.06.2018].

Table A 2: Key Species and National Wildlife Legislation, Policy and Biodiversity Framework

Species	Legislation, Planning Policy and UK Biodiversity Framework								
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of Habitats and Species Regulations 2017(Habitats Regulations)		Wildlife and Natural Environment (Scotland) Act 2011	The Protection of Badgers Act 1992	Scottish Biodiversity Strategy 2011-2020 (Scottish Government)
	Schedule 1	Schedule 5	Schedule 8	Schedule 9	European Protected Species	Annex II			
Otter		☐3 (part)			☐	☐			☐
Birds	☐5								☐6
Reptiles		☐7 (part)			☐8				☐9
Invertebrates		☐14 (full/part)			☐15	☐16			☐17
Fish		☐18 (full/part)			☐19	☐20			☐21
Plants			☐22	☐23	☐24	☐25	☐26		☐

1 In Scotland the WANE Act 2011, makes amendments to The protection of Badgers Act 1992. For the full list of amendments visit: <http://www.legislation.gov.uk/asp/2011/6/section/33/enacted?view=interweave> [Accessed 18.06.2018.]

2 In Scotland this act is amended by the WANE Act.

3 These species are partially protected under section 9(4)(b), (4)(c) and (5).

4 In Scotland the legal protection associated with this listing is currently restricted to the water voles' places of shelter or protection and does not extend to the animals themselves.

5 Schedules 1A and A1 apply in Scotland. A list of species within Schedules 1, 1A and A1 can be viewed here: <http://www.snh.gov.uk/docs/B469673.pdf> [Accessed 18.06.2018]

6 To view the current list of Scottish Biodiversity Strategy bird species visit: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> [Accessed 18.06.2018]

7 The three common reptile species found in Scotland, Adder (*Vipera berus*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5).

8 The only reptile species afforded this protection occurring in Scotland are marine turtles (*Cheloniidae* and *Dermochelyidae*). Sand lizard (*Lacerta agilis*) only occurs in Scotland as an introduced species to the Island of Coll and therefore this colony is not afforded EPS protection due to its introduced status. However, since it is listed on Annex IVa of the Habitats Directive, it is illegal to possess, control, transport, sell or offer for sale or exchange wild specimens.

9 To view the current list of Scottish Biodiversity Strategy herptile species visit: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> [Accessed 18.06.2018.]

10 Common frog (*Rana temporaria*), Common toad (*Bufo bufo*), Smooth newt (*Lissotriton vulgaris*) and Palmate newt (*Lissotriton helveticus*) are offered partial protection under section 9(5). Great crested newt (*Triturus cristatus*) and Natterjack toad (*Epidalea calamita*) are offered partial protection under section 9(4)(b) and (c) and (5). Pool frog (*Pelophylax lessonae*) is offered partial protection under section 9(4)(b) and (c)(1) only and with respect to England only.

11 Great crested newt and Natterjack toad are the only amphibians to be designated European Protected Species that occur in Scotland.

12 Great crested newt is the only Annex II amphibian.

13 To view the current list of Scottish Biodiversity Strategy amphibian species visit: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> [Accessed 18.06.2018.]

14 To view the current list of invertebrates that are protected under this Act visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 18.06.2018].

15 None of the species designated as European Protected Species occur in Scotland; Large blue butterfly (*Maculinea arion*), Fisher's estuarine moth (*Gortyna borelii lunata*) and Lesser whirlpool ram's-horn snail (*Anisus vorticulus*).

16 There are currently twelve invertebrates listed in Annex II; White-clawed crayfish (*Austropotamobius pallipes*), Southern damselfly (*Coenagrion mercuriale*), Marsh fritillary butterfly (*Eurodryas aurinia*), Violet click beetle (*Limoniscus violaceus*), Stag beetle (*Lucanus cervus*), Freshwater pearl mussel (*Margaritifera margaritifera*), Narrow-mouthed whorl snail (*Vertigo angustior*), Round-mouthed whorl snail (*Vertigo genesii*), Geyer's whorl snail (*Vertigo geyeri*), Desmoulin's whorl snail (*Vertigo moulinsiana*), Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) and Fisher's estuarine moth (*Gortyna borelii lunata*).

17 To view the current list of Scottish Biodiversity Strategy invertebrate species visit: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> [Accessed 18.06.2018]

18 To view the current list of fish visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/5> [Accessed 18.06.2018].

19 Sturgeon (*Acipenser sturio*) is the only fish to be designated a European Protected Species.

20 There are eight fish species listed as Annex II. To view the current list visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 18.06.2018].

21 To view the current list of Scottish Biodiversity Strategy fish species visit: <http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> [Accessed 18.06.2018].

22 To view the current list of Schedule 8 listed plants visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/8> [Accessed 18.06.2018].

23 To view the current list of Schedule 9 listed plants visit: <http://www.legislation.gov.uk/ukpga/1981/69/schedule/9> [Accessed 18.06.2018]

24 There are nine plant species designated as European Protected Species. To view the current list visit: <http://www.legislation.gov.uk/uksi/2010/490/schedule/5/made> [Accessed 18.06.2018].

25 To view the current list of Annex II plant species visit: <http://jncc.defra.gov.uk/page-1523> [Accessed 18.06.2018].

26 In Scotland the WANE Act 2011 makes amendments to Section 14 of the WCA 1981 (as amended) with regard to invasive species listed within Schedule 9 of the WCA 1981 (as amended). The full list of amendments can be viewed here: http://www.legislation.gov.uk/asp/2011/6/pdfs/asp_20110006_en.pdf [Accessed 18.06.2018].

Appendix B

SUMMARY OF ECOLOGICAL DESK
STUDY DATA

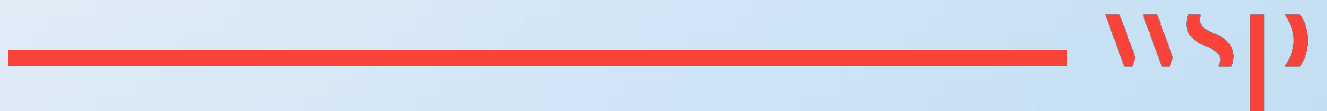


Table 1 - Protected and notable mammals for which records have been identified within 1km

Species common name	Species Latin name	No. of records	Distance from Site	Legal / Conservation Status ³⁹
Common pipistrelle	Pipistrellus pipistrellus	1	877m	HabReg, W&CA, S7, RD2 (UK), LBAP
European otter	Lutra lutra	1	428m	HabReg, W&CA, S7, LBAP
Polecat	Mustela putorius	1	770m	S7, RD2 (UK), LBAP

Table 2 - Protected and notable birds for which records have been identified within 1km

Species common name	Species Latin name	No. of records	Distance from Site	Legal / Conservation Status ⁵⁰
Goldfinch	Carduelis carduelis	1	645m	W&CA
Great spotted woodpecker	Dendrocopos major	1	645m	W&CA
House martin	Delichon urbicum	1	645m	W&CA, Amber
House sparrow	Passer domesticus	1	645m	W&CA, S7, Red
Nuthatch	Sitta europaea	1	645m	W&CA
Pied wagtail	Motacilla alba	2	462m	W&CA
Red kite	Milvus milvus	2	645m	W&CA Schedule 1
Swallow	Hirundo rustica	1	645m	W&CA

Table 3 - Protected and notable invertebrates for which records have been identified within 1km

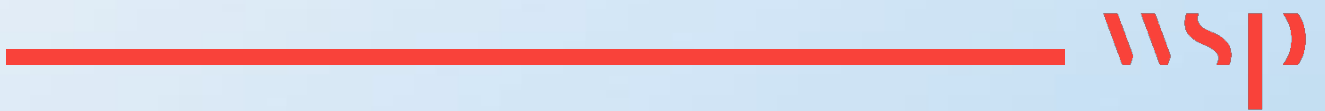
Species common name	Species Latin name	No. of records	Distance from Site	Legal / Conservation Status ⁵⁰
Autumnal rustic	Eugnorisma glareosa	2	813m	S7
Blood-vein	Timandra comae	1	955m	S7
Brindled beauty	Lycia hirtaria	4	870m	S7
Broom moth	Ceramia pisi	4	813m	S7
Buff ermine	Spilosoma lutea	9	638m	S7
Centre-barred sallow	Atethmia centrargo	1	813m	S7
Dark-barred twin-spot carpet	Xanthorhoe ferrugata	1	839m	S7

³⁹ HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), S7 = Section 7 Environment Wales Act (2016), LBAP = Local Biodiversity Action Plan, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), Red = Birds of Conservation Concern 4, Amber = Birds of Conservation Concern 4.

Species common name	Species Latin name	No. of records	Distance from Site	Legal / Conservation Status ⁵⁰
Double dart	<i>Graphiphora augur</i>	5	813m	S7
Double line	<i>Mythimna turca</i>	8	813m	LBAP
Dusky brocade	<i>Apamea remissa</i>	2	839m	S7
Galium carpet	<i>Epirrhoe galiata</i>	1	813m	S7
Oak hook-tip	<i>Watsonalla binaria</i>	1	813m	S7
Oblique carpet	<i>Orthonama vittata</i>	2	839m	S7
Powdered quaker	<i>Orthosia gracilis</i>	1	813m	S7
Sallow	<i>Cirrhia icteritia</i>	2	813m	S7
Small phoenix	<i>Ecliptopera silaceata</i>	12	813m	S7
Small square-spot	<i>Diarsia rubi</i>	1	955m	S7
White ermine	<i>Spilosoma lubricipeda</i>	16	638m	S7

Appendix C

PLANT SPECIES RECORDED



SEMI-IMPROVED ACID GRASSLAND (B1)

Table 1 - Plant species recorded at B1.2 (1)

Common name	Latin name	Frequency (DAFOR)
Moss species	-	A
Sheep's-fescue	<i>Festuca ovina</i>	F
Bluebell	<i>Hyacinthoides non-scripta</i>	O
Bracken	<i>Pteridium aquilinum</i>	O
Heath Bedstraw	<i>Galium saxatile</i>	O
Common Bent	<i>Agrostis capillaris</i>	R
Creeping Soft-grass	<i>Holcus mollis</i>	R
Heath Wood-rush	<i>Luzula multiflora</i>	R
Pignut	<i>Conopodium majus</i>	R
Sessile Oak	<i>Quercus petraea</i>	R
Sheep's Sorrel	<i>Rumex acetosella</i>	R
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	R
Ground Ivy	<i>Glechoma hederacea</i>	LA
Yorkshire-fog	<i>Holcus lanatus</i>	LA

Table 2 - Plant species recorded at B1.2 (2)

Common name	Latin name	Frequency (DAFOR)
Pignut	<i>Conopodium majus</i>	F
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Creeping Soft-grass	<i>Holcus mollis</i>	O
Mouse-ear-hawkweed	<i>Hieracium pilosella</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	O
Sheep's Sorrel	<i>Rumex acetosella</i>	O
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	O
White Clover	<i>Trifolium repens</i>	O
Bracken	<i>Pteridium aquilinum</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	R
Common Dog-violet	<i>Viola riviniana</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	R
Heath Bedstraw	<i>Galium saxatile</i>	R
Heath Wood-rush	<i>Luzula multiflora</i>	R
Spear Thistle	<i>Cirsium vulgare</i>	R
Spring-sedge	<i>Carex caryophyllaea</i>	R
Tormentil	<i>Potentilla erecta</i>	R
Yarrow	<i>Achillea millefolium</i>	R

Yorkshire-fog	<i>Holcus lanatus</i>	R
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	LA

Table 3 - Plant species recorded at B1.2 (3)

Common name	Latin name	Frequency (DAFOR)
Bryophyte species	-	A
Lichen species	-	A
Lesser Trefoil	<i>Trifolium dubium</i>	F
Sheep's-fescue	<i>Festuca ovina</i>	F
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Yarrow	<i>Achillea millefolium</i>	F
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	O
Dandelion	<i>Taraxacum officinale</i> agg.	O
Mouse-ear-hawkweed	<i>Hieracium pilosella</i>	O
Red Clover	<i>Trifolium pratense</i>	O
Cat's-ear	<i>Hypochaeris radicata</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	R
Heath Wood-rush	<i>Luzula multiflora</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R

Table 4 - Plant species recorded at B1.2 (4)

Common name	Latin name	Frequency (DAFOR)
Moss species	-	A
Sheep's-fescue	<i>Festuca ovina</i>	A
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Heath Wood-rush	<i>Luzula multiflora</i>	O
Bilberry	<i>Vaccinium myrtillus</i>	R
Common Bent	<i>Agrostis capillaris</i>	R
Heath Bedstraw	<i>Galium saxatile</i>	R
Heather	<i>Calluna vulgaris</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Creeping Soft-grass	<i>Holcus mollis</i>	LA
Floating Sweet-grass	<i>Glyceria fluitans</i>	LA

Table 5 - Plant species recorded at B1.2 (5)

Common name	Latin name	Frequency (DAFOR)
Heath Wood-rush	<i>Luzula multiflora</i>	F

Sheep's-fescue	<i>Festuca ovina</i>	F
Soft-rush	<i>Juncus effusus</i>	F
Dandelion	<i>Taraxacum officinale</i> agg.	O
Meadow Buttercup	<i>Ranunculus acris</i>	O
Mouse-ear-hawkweed	<i>Hieracium pilosella</i>	O
Pignut	<i>Conopodium majus</i>	O
Rough Meadow-grass	<i>Poa trivialis</i>	O
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	O
Tormentil	<i>Potentilla erecta</i>	O
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	R
Common Figwort	<i>Scrophularia nodosa</i>	R
Hairy Bitter-cress	<i>Cardamine hirsuta</i>	R
Heath Bedstraw	<i>Galium saxatile</i>	R
Marsh Thistle	<i>Cirsium palustre</i>	R
Red Clover	<i>Trifolium pratense</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Common Valerian	<i>Valeriana officinalis</i>	LA
Gorse	<i>Ulex europaeus</i>	LA

NEUTRAL GRASSLAND (B2)

Table 6 -Plant species recorded at B2 (1)

Common name	Latin name	Frequency (DAFOR)
Cock's-foot	<i>Dactylis glomerata</i>	R
Common Bent	<i>Agrostis capillaris</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	R
Common Sorrel	<i>Rumex acetosa</i>	O
Creeping Buttercup	<i>Ranunculus repens</i>	R
Crested Dog's-tail	<i>Cynosurus cristatus</i>	R
Dog lichen species	<i>Peltigera</i> sp.	R
Foxglove	<i>Digitalis purpurea</i>	R
Heath Wood-rush	<i>Luzula multiflora</i>	O
Marsh Thistle	<i>Cirsium palustre</i>	R
Moss species	-	F
Perennial Rye-grass	<i>Lolium perenne</i>	O
Red Fescue	<i>Festuca rubra</i>	O
Sheep's-fescue	<i>Festuca ovina</i>	LA
Soft-rush	<i>Juncus effusus</i>	F

Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	R
White Clover	<i>Trifolium repens</i>	O
Common Nettle	<i>Urtica dioica</i>	LA
Smooth Meadow-grass	<i>Poa pratensis</i>	O

Table 7 - Plant species recorded at B2 (2)

Common name	Latin name	Frequency (DAFOR)
Moss species		F
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Ash	<i>Fraxinus excelsior</i>	O
Cock's-foot	<i>Dactylis glomerata</i>	O
Sessile Oak	<i>Quercus petraea</i>	O
Sheep's-fescue	<i>Festuca ovina</i>	O
Smooth Meadow-grass	<i>Poa pratensis</i>	O
Yorkshire-fog	<i>Holcus lanatus</i>	O
Bracken	<i>Pteridium aquilinum</i>	R
Crab Apple	<i>Malus sylvestris</i>	R
Field Wood-rush	<i>Luzula campestris</i>	R
Heath Bedstraw	<i>Galium saxatile</i>	R
Annual Meadow-grass	<i>Poa annua</i>	LA
Common Dog-violet	<i>Viola riviniana</i>	LA
Common Nettle	<i>Urtica dioica</i>	LA
Germander Speedwell	<i>Veronica chamaedrys</i>	LA
Ground Ivy	<i>Glechoma hederacea</i>	LA

Table 8 - Plant list recorded at B2 (3)

Common name	Latin name	Frequency (DAFOR)
Moss species	-	F
Pignut	<i>Conopodium majus</i>	F
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	F
Bracken	<i>Pteridium aquilinum</i>	O
Common Sorrel	<i>Rumex acetosa</i>	O
Foxglove	<i>Digitalis purpurea</i>	O
Lady-fern	<i>Athyrium filix-femina</i>	O
Lesser Celandine	<i>Ficaria verna</i>	O
Rough Meadow-grass	<i>Poa trivialis</i>	O
Water Mint	<i>Mentha aquatica</i>	O

Bluebell	<i>Hyacinthoides non-scripta</i>	R
Cowslip	<i>Primula veris</i>	R
Lesser Stitchwort	<i>Stellaria graminea</i>	R
Perennial Rye-grass	<i>Lolium perenne</i>	R
Sessile Oak	<i>Quercus petraea</i>	R
Annual Meadow-grass	<i>Poa annua</i>	LA

MARSHY GRASSLAND (B5)

Table 9 - Plant list recorded for B5 (1)

Common name	Latin name	Frequency (DAFOR)
Purple Moor-grass	<i>Molinia caerulea</i>	D
Cross-leaved Heath	<i>Erica tetralix</i>	O
Deergrass	<i>Trichophorum cespitosum</i>	O
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	O
Bilberry	<i>Vaccinium myrtillus</i>	R
Carnation Sedge	<i>Carex panicea</i>	R
Common Cottongrass	<i>Eriophorum angustifolium</i>	R
Common Yellow-sedge	<i>Carex demissa</i>	R
Fern species	-	R
Flea Sedge	<i>Carex pulicaris</i>	R
Heath Milkwort	<i>Polygala serpyllifolia</i>	R
Heath Wood-rush	<i>Luzula multiflora</i>	R
Jointed Rush	<i>Juncus articulatus</i>	R
Lichen species	-	R
Marsh Thistle	<i>Cirsium palustre</i>	R
Mat-grass	<i>Nardus stricta</i>	R
Red Fescue	<i>Festuca rubra</i>	R
Soft-rush	<i>Juncus effusus</i>	R
Sphagnum moss species	-	R
Tormentil	<i>Potentilla erecta</i>	R
Heath Spotted-orchid	<i>Dactylorhiza maculata</i>	LA
Lousewort	<i>Pedicularis sylvatica</i>	LA

Table - Plant list recorded for B5 (2)

Common name	Latin name	Frequency (DAFOR)
Soft-rush	<i>Juncus effusus</i>	F
Purple Moor-grass	<i>Molinia caerulea</i>	O

Yorkshire-fog	<i>Holcus lanatus</i>	O
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Table 11-Plant list recorded for B5 (3)

Common name	Latin name	Frequency (DAFOR)
Soft-rush	<i>Juncus effusus</i>	F
Bilberry	<i>Vaccinium myrtillus</i>	O
Common Cottongrass	<i>Eriophorum angustifolium</i>	O
Heath Bedstraw	<i>Galium saxatile</i>	O
Heath Wood-rush	<i>Luzula multiflora</i>	O
Sphagnum moss species	-	O
Yorkshire-fog	<i>Holcus lanatus</i>	O
Cuckooflower	<i>Cardamine pratensis</i>	R
Fern species	-	R
Heath Milkwort	<i>Polygala serpyllifolia</i>	R
Sheep's-fescue	<i>Festuca ovina</i>	LA

POOR SEMI-IMPROVED GRASSLAND (B6)

Table 12 - Plant list recorded for B6 (1)

Common name	Latin name	Frequency (DAFOR)
Red Fescue	<i>Festuca rubra</i>	F
Moss species	-	F
Yorkshire-fog	<i>Holcus lanatus</i>	F
Heath Wood-rush	<i>Luzula multiflora</i>	O
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	O
White Clover	<i>Trifolium repens</i>	O
Annual Meadow-grass	<i>Poa annua</i>	R
Bluebell	<i>Hyacinthoides non-scripta</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	R
Marsh Thistle	<i>Cirsium palustre</i>	R
Meadow Buttercup	<i>Ranunculus acris</i>	R
Pignut	<i>Conopodium majus</i>	R
Rough Meadow-grass	<i>Poa trivialis</i>	R
Sheep's Sorrel	<i>Rumex acetosella</i>	R
Tormentil	<i>Potentilla erecta</i>	R
Bracken	<i>Pteridium aquilinum</i>	LA
Soft-rush	<i>Juncus effusus</i>	LA

ROCK EXPOSURE AND WASTE OTHER EXPOSURE – ACID/ NEUTRAL (I141)

Table 13 - Plant list recorded at I141 (1)

Common name	Latin name	Frequency (DAFOR)
Mat-grass	<i>Nardus stricta</i>	O
Mouse-ear-hawkweed	<i>Hieracium pilosella</i>	O
Red Clover	<i>Trifolium pratense</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	O
Sheep's-fescue	<i>Festuca ovina</i>	O
Yorkshire-fog	<i>Holcus lanatus</i>	O
Cat's-ear	<i>Hypochaeris radicata</i>	R
Sheep's Sorrel	<i>Rumex acetosella</i>	R
Heather	<i>Calluna vulgaris</i>	LA

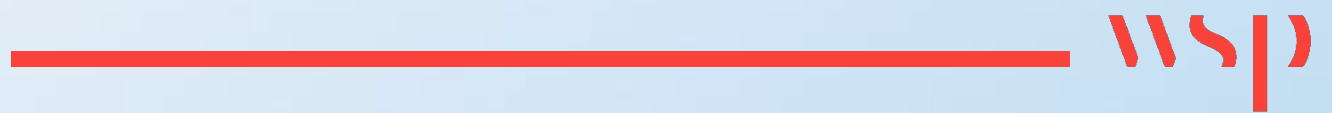
EPHEMERAL/ SHORT PERENNIAL (J1.3)

Table 14 - Plant list recorded for J1.3 (1)

Common name	Latin name	Frequency (DAFOR)
Moss species	-	A
Sheep's-fescue	<i>Festuca ovina</i>	LF
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	LF
Sheep's Sorrel	<i>Rumex acetosella</i>	O
Common Nettle	<i>Urtica dioica</i>	R
Dog lichen species	<i>Peltigera</i> sp.	R
Foxglove	<i>Digitalis purpurea</i>	R
Heath Bedstraw	<i>Galium saxatile</i>	R
Mouse ear species	<i>Cerastium</i> sp.	R

Appendix D

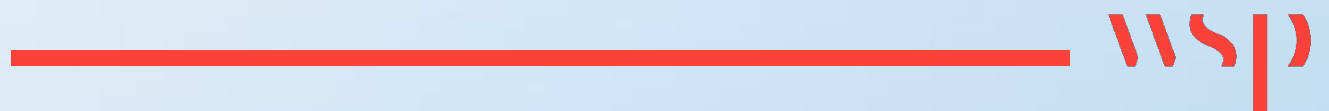
TARGET NOTES



Target Note	Description
TN1	Fresh otter spraint on rock in the centre of the stream. Just outside of the Site Grid Reference: SN 74504 65942
TN2	Dry stone wall
TN3	Log pile
TN4	Damaged sessile oak tree. Still alive. Lot of limbs torn out. Exposed - no surrounding trees/tree cover. Low potential
TN5	Ash has lots of cankering and a hole lower down. Low potential
TN6	Ash - roots pulling out of the ground and some cankering. Low potential
TN7	Two well used tunnels, D-Shaped with badger potential. Fresh spoil and badger hair found in one entrance. Located south facing on a fine spoil heap. Quite exposed, no mammal trails, latrines etc. GR: SN 274352 266066.
TN8	5m meter long shingle bed in the river channel.

Appendix E

AFON TEIFI / RIVER TEIFI SAC / SSSI
CITATION



Afon Teifi/ River Teifi

Site details

<http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0012670>



Location of Afon Teifi/ River Teifi SAC/SCI/cSAC

Country	Wales
Unitary Authority	West Wales and The Valleys
Centroid*	SN515508
Latitude	52.13583333
Longitude	-4.170833333
SAC EU code	UK0012670
Status	Designated Special Area of Conservation (SAC)
Area (ha)	691.07

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

General site character

Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins) (20%)
Salt marshes, Salt pastures, Salt steppes (1.7%)
Inland water bodies (Standing water, Running water) (45.1%)
Bogs, Marshes, Water fringed vegetation, Fens (8.9%)
Heath, Scrub, Maquis and Garrigue, Phygrana (2.7%)
Humid grassland, Mesophile grassland (1.7%)
Improved grassland (7.5%)
Broad-leaved deciduous woodland (10.5%)
Inland rocks, Screes, Sands, Permanent Snow and ice (1.1%)
Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites) (0.8%)

[Natura 2000 standard data form](#) for this site as submitted to Europe (PDF, < 100kb).

Note:

When undertaking an appropriate assessment of impacts at a site, **all** features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

The Teifi in west Wales is a large river flowing over hard rock, with some spectacular gorges in the lower section. It is mainly mesotrophic but also has oligotrophic sections in the upper reaches, and represents an outstanding example of a sub-type 3 river with water-crowfoot *Ranunculus* vegetation in western Britain. The river has a spatey flow regime, and in-stream vegetation is dominated by stream water-crowfoot *Ranunculus penicillatus* ssp. *penicillatus*, water-starworts *Callitriche hamulata* and *C. obtusangula* and the aquatic moss *Fontinalis squamosa* in a diverse macrophyte community characteristic of oligo-mesotrophic base-poor rocks. A small amount of *R. penicillatus* ssp. *pseudofluitans* is present where one tributary flows over base-rich rocks. The river is also noteworthy for an unusually low-gradient section flowing through Cors Caron, a large area of **7110 Active raised bog** that is an SAC in its own right.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

Annex II species that are a primary reason for selection of this site

1096 Brook lamprey *Lampetra planeri*

The Teifi is a predominantly mesotrophic river in west Wales supporting a large population of **brook lamprey** *Lampetra planeri*. A mixture of habitat and substrate types provides the combination of spawning gravels adjacent to silt beds that are favoured by this and other lamprey species. A large number of tributaries have been included in the SAC; these are thought to be important for lampreys in the Teifi because the main channel is prone to severe floods that may result in washout of smaller ammocoetes.

1099 River lamprey *Lampetra fluviatilis*

The Teifi is a large catchment of high conservation value in west Wales. It contains a healthy population of **river lamprey** *Lampetra fluviatilis*. The semi-natural channel containing a mixture of substrates and in-stream features provides excellent habitat for juvenile lampreys.

1106 Atlantic salmon *Salmo salar*

The Teifi is a medium-sized mesotrophic river system in west Wales. In 1999 the **salmon** *Salmo salar* rod catch in the Teifi was the third-largest in Wales, and the system has not experienced the steep decline in stock numbers seen in many other rivers in the area. This is likely to reflect the high quality of the catchment, with a semi-natural channel largely unaffected by poor water quality or artificial barriers to migration. However, in common with many other Welsh rivers, acidification in the

upper reaches is a cause for concern. In common with many other rivers in west Wales, grilse are the main stock component. There is a small traditional coracle fishery that exploits the salmon and sea trout *Salmo trutta trutta*.

1163 Bullhead *Cottus gobio*

The Teifi represents **bullhead *Cottus gobio*** in west Wales. Water quality is generally good, and the diversity of semi-natural habitat and predominance of stony substrates provides excellent bullhead habitat throughout much of the catchment. Environment Agency electrofishing data shows this species to be widespread throughout the system. Bullheads show marked differences in growth and longevity between upland and lowland streams, and the Teifi includes sections representing both types of habitat.

1355 Otter *Lutra lutra*

The Teifi in west Wales holds **otter *Lutra lutra*** throughout much of its catchment. The river has suitable resting and breeding sites along its length. Evidence from surveys and sightings suggest the tidal reach is being increasingly used by otters.

1831 Floating water-plantain *Luronium natans*

The Teifi is a mixed habitat supporting **floating water-plantain *Luronium natans*** at the western margins of its range in the UK. This species has been recorded in the nutrient-poor standing waters of the Teifi pools in the headwaters of the river. It has also been recorded in a moderately nutrient-rich stretch of the river immediately downstream of Cors Caron.

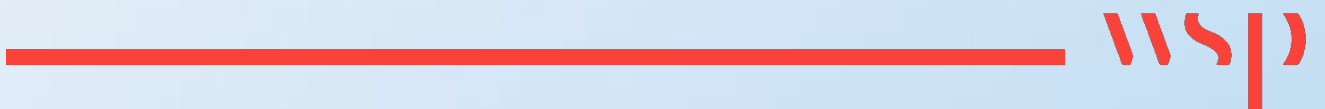
Annex II species present as a qualifying feature, but not a primary reason for site selection

1095 Sea lamprey *Petromyzon marinus*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

Appendix F

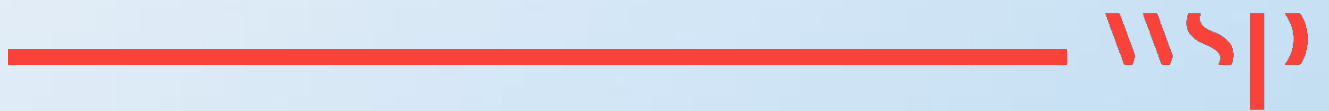
INCIDENTAL RECORDS



Species	Common Name
<i>Cuculus canorus</i>	Cuckoo
<i>Carduelis carduelis</i>	Goldfinch
<i>Corvus monedula</i>	Jackdaw
<i>Alauda arvensis</i>	Skylark
<i>Motacilla alba</i>	Pied Wagtail
<i>Turdus viscivorus</i>	Mistle Thrush
<i>Gerridae sp.</i>	Pond Skater
<i>Milvus milvus</i>	Red Kite
<i>Buteo buteo</i>	Common Buzzard
<i>Corvus corone</i>	Carrion Crow
<i>Hirundo rustica</i>	Swallow
<i>Oenanthe oenanthe</i>	Wheatear
<i>Calopteryx virgo</i>	Beautiful damoiselle damselfly
<i>Pica pica</i>	Magpie
<i>Phylloscopus trochilus</i>	Willow Warbler
<i>Cinclus cinclus</i>	Dipper
<i>Prunella modularis</i>	Dunnock

Appendix G

PHOTOGRAPHS



Photographs



Photograph 1: A mosaic of poor semi-improved grassland and marshy grassland.



Photograph 2: The Afon Teifi.



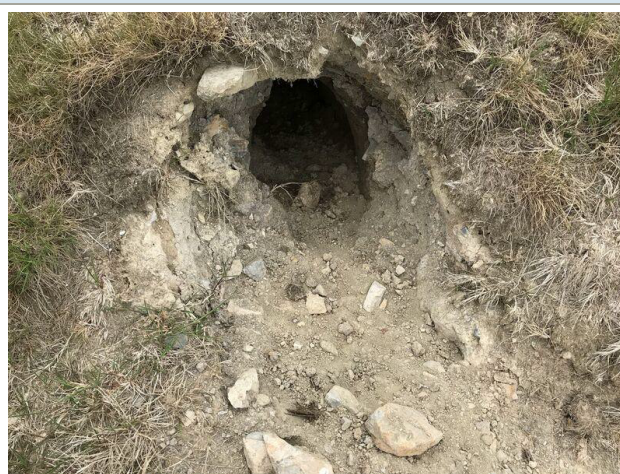
Photograph 3: Acid grassland semi-improved.



Photograph 4: The Afon Teifi.



Photograph 5: Inland cliff.



Photograph 6: Potential badger sett entrance.



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