



**DALCOUR
MACLAREN**

Global Centre of Rail Excellence

Strategic Biodiversity Plan

Client: Ove Arup & Partners Ltd

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Project Details

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1 Introduction

1.1 Commission

- 1.1.1 Dalcour Maclaren (DM) have been commissioned by Ove Arup & Partners Ltd (Arup) on behalf of their client Global Centre of Rail Excellence (GCRE) Ltd, to produce a Strategic Biodiversity Plan (SBP) for the GCRE project, which sits in the Counties of Neath Port Talbot and Powys.

1.2 Background

- 1.2.1 The SBP has been prepared to discharge Condition 18, of the planning consents P2021/0381 (Neath Port Talbot Council (NPTC) and 21/0559/OUT (Powys County Council (PCC), which relate to the site clearance and development of railway testing and research infrastructure associated with the GCRE project.

- 1.2.2 Condition 18 in each of the above planning applications states that:

'No development shall take place in any phase of development as identified in condition 7 (including demolition, ground works, site or vegetation clearance) until such time as a Strategic Biodiversity Plan has been submitted to and approved in writing by the Local Planning Authority. The SBP shall set out the approach to be taken to the production of phase-specific Biodiversity Plans under condition 19.

The SBP shall include but is not limited to the following:

- *Methodologies and principles for scheduling of pre-commencement ecological checks and where necessary update to ecological surveys, particularly for protected species, taking account of CIEEM Advice note on the Lifespan of Ecological Report and Surveys.*
- *Methodology to update and confirm the quantitative assessment of habitat loss and creation (updating Environmental Statement 7.19.48, table 7.8 and Appendices 7T and 7V).*
- *A biodiversity enhancement scheme that will set out the approach to the design and implementation of enhancement measures including, but not limited to, the measures set out in 7.23.1-7.23.7 inclusive of the Environmental Statement.*
- *Detail the mechanism, including principles to be applied, for the review of the adequacy of mitigation, compensation and enhancement measures in light of pre-commencement ecological checks and / or surveys. This will include the inclusion of new, revised and additional measures where necessary to ensure the scheme delivers an overall net benefit.*

- 1.2.3 Phase-specific Biodiversity Plans, in accordance with condition 19 of the planning consents, will be produced further to this SBP, for each phase of

development. The Phased Biodiversity Plans (PBP) shall be in line with this SBP as well as implement and demonstrate compliance with the approach set out in the SBP agreed under condition 18.

1.3 Site Description and Context

- 1.3.1 The project site (hereafter referred to as the 'Site'), as defined by the planning application red line boundary is shown in Appendix 1. The Site comprises approximately 475 ha, located in the Dulais Valley, between the counties of Neath Port Talbot and Powys.
- 1.3.2 The Site has been previously worked as an open cast coal mine, and comprises brownfield restored land, overburden mounds, coal stocking areas, barrel wash and plant maintenance areas, site office facilities, and a void which is currently being mined. This part of the Site is referred to as the 'Nant Helen' site.
- 1.3.3 Onllwyn Washery and Distribution Centre (58ha), which is located in the south-eastern part of the Site, has served as a preparation and washery facility for the mining activities. This part of the site is referred to as the 'Washery' site.
- 1.3.4 Coal Washing Activities ceased by the 6th May 2022 with dispatch of coal by rail ceasing at the end of May 2022 and dispatch of coal by road by the end of 2022.

1.4 The GCRE application

- 1.4.1 As discussed above, planning consents P2021/0381 (Neath Port Talbot Council (NPTC) and 21/0559/OUT (Powys County Council (PCC), relate to the Site clearance and development of railway testing and research infrastructure associated with the GCRE project.
- 1.4.2 An Environmental Statement (ES)¹ was produced as part of an EIA application (under the Town and County Planning (Environmental Impact Assessment (Wales) Regulations 2017 ('The EIA Regulations')), and the Ecology Chapter (Chapter 7) details the Ecological Impact Assessment (EcIA), in line with the Guidelines for Ecological Impact Assessment in the UK and Ireland ('the CIEEM Guidelines')² and provides recommendations for mitigation and enhancement specific to the GCRE scheme.
- 1.4.3 The GCRE ES1 assesses the potential impacts of the GCRE project on the 'Future baseline' which encompasses agreed habitat creation and

¹ Arup (2021) GCRE: Environmental Statement. Welsh Government.

² CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.1. Chartered Institute of Ecology and Environmental Management.

enhancements within the site as part of a previously consented EIA applications (the Future baseline is further discussed in Appendix 10).

- 1.4.4 The GCRE ES1 and ecological mitigation builds on measures already agreed within a separate ES / Ecology Chapter for the Nant Helen Complementary Earthworks scheme (as discussed below in Section 1.5).

1.5 Other Relevant Planning Consents and Environmental Statements – the Nant Helen Complementary Earthworks Scheme

- 1.5.1 In April 2020, Celtic Energy submitted two EIA planning applications for both Neath Port Talbot (P/2020/0362) and Powys (reference: 20/0738/FUL (Powys) and a supporting ES3 for a complementary earthworks scheme, within the area of Nant Helen. The earthworks scheme provides a comprehensive, flexible and adaptable landform across the entire site (of Nant Helen) that could support a wide range of future uses; including GCRE, establishing the earthworks formation and associated drainage and landscaping for two of the key components of the rail testing facility, namely the high speed and infrastructure test loops and rail line connections. This EIA planning application for the earthworks is hereafter referred to as the ‘Nant Helen Complementary Earthworks’ application’. This application did not include the area of the Washery, which forms part of the GCRE scheme.
- 1.5.2 The Nant Helen Complementary Earthworks application also aligns to a previous planning application by Celtic Energy (consented in 2011) (reference: 2011 / 0217), and accompanying ES4, for the restoration of part of the Nant Helen site further to the completion of mining activities. This includes the restoration and enhancement of the Site’s habitats in areas affected by the previous mining activities. The Nant Helen Complementary Earthworks application assumes that the Celtic Energy restoration has already taken place and therefore also considers the loss of habitats from the proposed habitats created by Celtic Energy as well as loss of habitats from the existing ecological baseline.

1.6 Objectives / Purpose of this document

- 1.6.1 This document sets out the vision of biodiversity mitigation for the Site; providing the overarching approach to mitigation and enhancement in each phase of the development. The full details of the specific measures that will be implemented for each phase⁵ will be documented in separate PBPs that

³ Arup (2020) Nant Helen Complementary Earthworks: Environmental Statement. Celtic Energy.

⁴ Celtic Energy (2011) Nant Helen Restoration: Environmental Statement. Celtic Energy

⁵ PBPs are not required for Phases 1A and 2A as the details to discharge Condition 19 are contained within this document and the associated Ecological Protection Plan, and Ecological Management and Monitoring Plan and there will be no variation to the proposed works.

will be developed at a later date. The SBPs provide the relevant Local Planning Authorities, ecological consultants and designers and other stakeholders and consultancies involved in the development of the site with an overview prior to the PBPs being produced.

- 1.6.2 Although this document is a requirement of a planning condition for the GCRE application (and relevant planning consents: P2021/0381 21/0559/OUT), an earlier EIA application for the site and associated ES3, referred to as 'the Nant Helen Complementary Earthworks', is also considered relevant due to the production of an additional biodiversity mitigation strategy which complements the GCRE application and covers other areas of the project Site. Details of this application are provided in Section 1.5.
- 1.6.3 In addition to detailing the agreed biodiversity mitigation and enhancements (as consented by both the GCRE and Nant Helen Complementary Earthworks applications) and how these will be delivered per phase of the development, this document sets out the principals of how these measures will be implemented, which should guide the final detailed mitigation / enhancement proposals included in specific phase-specific PBPs.
- 1.6.4 In order to ensure biodiversity mitigation detailed within landscaping plans, along with phase-specific PBPs including protected species licensing, is appropriate, species surveys also need to be updated in accordance with best practice guidance; therefore, this document sets out the approach to updating baseline ecology surveys and completing preconstruction surveys. The approach to reviewing new survey information and updating mitigation / enhancement measures is also detailed.
- 1.6.5 Furthermore, this document sets out the approach to updating habitat calculations within the Phase-specific Biodiversity Plans, for habitat loss, gain and enhancement (once the landscaping / biodiversity mitigation design has been confirmed for each phase within phase specific landscaping plans), and; provides a tracker which can be updated within each Phase-specific Biodiversity Plan to demonstrate how habitat creation / enhancement goals are being met in each Phase and ensures that there is no residual requirement for habitat creation / enhancement once the scheme has been completed.
- 1.6.6 Therefore, the following are set out within this document:
 - Background of the Site, including planning consents, earthworks phasing information and ecological baseline.
 - Habitat creation and enhancements agreed for the project Site i.e. the Sites 'vision', in addition to habitat calculations completed based

on the proposals (in both the Nant Helen Complementary Earthworks application and the GCRE application).

- Principles for habitat creation and enhancements – setting out agreed measures and other opportunities.
- A phasing plan for the delivery of biodiversity mitigation and enhancements.
- How to update habitat loss, gain and enhancement calculations, per phase of development.
- Updating surveys and completing pre construction surveys; and
- The review of the adequacy of mitigation and enhancement measures in light of up to date information.

1.6.7 This document will be submitted to and approved by NPTC and PCC, prior to the preparation and submission of any future PBPs⁵, 6 which will be produced in accordance with this SBP.

1.6.8 Once NPTC and PCC have reviewed the SBP and provided written response in support of the document, condition 18 of the outline planning consents (P2021/0381 and 21/0559/OUT) can be formally discharged.

1.7 Legislation and Policy Context

1.7.1 The project's ES1 and requirement for the production of the SBP, and subsequent PBPs, are underpinned by a framework of wildlife legislation and policy which aim to protect specific sites, habitats and species. Full details of relevant legislation and policy are provided in Appendix 2.

1.8 The Development and Phasing

1.8.1 A full description of the earthworks and subsequent development is given in Chapter 3 of the Nant Helen Complementary Earthworks ES3 (and previous Celtic Energy 2011 ES)⁴, and the GCRE ES1; however, in summary: earthworks will be undertaken to create a suitable platform for the installation of GCRE infrastructure; further to Celtic Energy restoring the site post completion of mining activities within the site. GCRE which comprises a rail testing, maintenance, research, development and storage facility; will then be developed within the site.

1.8.2 The earthworks to facilitate the development will be phased as detailed in Table 2. Details of the phasing plan are provided in a separate technical note provided to discharge Condition 07 (GCRE Ltd 2022)⁷. The phasing plans are provided in Appendix 3 in drawings GCRE-WA-62-00-DR-W-SK 01-04).

⁶ Condition 19 states that submission to and approval by NPTC and PCC of each future PBP is required before each phase of development commences.

⁷ GCRE Ltd (2022) Condition 07 - Phasing Plans Supporting Narrative

Table 3 provides an indicative programme for the further development of the site in accordance with the GCRE project.

- 1.8.3 Table 1 presents the location within this report where each of the mandatory requirements for the SBP, as set out by Condition 18 are addressed.

Table 1 : SBP requirements (under Condition 18) and the location where they are addressed within the document

Specific requirement for SBP to address	Location where requirement is addressed within the document
Methodologies and principles for scheduling of pre-commencement ecological checks and where necessary update to ecological surveys, particularly for protected species, taking account of CIEEM Advice note on the Lifespan of Ecological Report and Surveys.	Section 5 5.1.1- 5.3.15
Methodology to update and confirm the quantitative assessment of habitat loss and creation (updating ES 7.19.48, table 7.8 and Appendices 7T and 7V).	Section 4 4.1.1 - 4.2.7
A biodiversity enhancement scheme that will set out the approach to the design and implementation of enhancement measures including, but not limited to, the measures set out in 7.23.1-7.23.7 inclusive, of the Environmental Statement.	Section 2 2.1.1 - 2.2.4
Detail the mechanism, including principles to be applied, for the review of the adequacy of mitigation, compensation and enhancement measures in light of pre-commencement ecological checks and / or surveys. This will include the inclusion of new, revised and additional measures where necessary to ensure the scheme delivers an overall net benefit.	Section 7 7.1.1 - 7.1.5 Section 8

Table 2 Earthworks phasing of the GCRE development

Year /Quarter (indicative only)	Phase	Construction works sequence
Washery		
February 2023 – July 2023 (1 st Qtr 2023 onwards)	Phase 1A (Washery)	- Erection of temporary and permanent fencing - Removal of existing rail track - Breakout of existing concrete hardstanding - Regrading of existing ground profile and placing surplus fill within the landscape area - Installation of permanent swale drainage
July 2023 - Dec 2024 (3rd Qtr 2023 onwards)	Phase 2A (Washery)	
Nant Helen		
April 2023 – Jan 2024 (2 nd Qtr 2023 onwards)	Phase 1 (Nant Helen)	- Erection of temporary protective and permanent fencing - Stripping of existing soils and place into temporary stockpiles - Installation of temporary drainage measures and excavation of permanent 2No attenuation ponds to be used as temporary settlement ponds - Excavation of cutting, placing of fill to permanent embankment and placing of surplus material to the designated landscape area. - Installation of permanent drainage - Placing of topsoil to batters - Construction of Permanent Way - Planting of landscaping and seeding within the appropriate season
Feb 2023 – Sep 2024 (1 st Qtr 2023 onwards)	Phase 2 (Nant Helen)	- Erection of temporary protective and permanent fencing - Undertake tree clearance works (Last Quarter 2022) - Stripping of existing soils and place into temporary stockpiles (Early 2023) - Installation of temporary drainage measures and excavation of the 2No permanent attenuation ponds to be used as temporary settlement ponds - Excavation of cuttings, placing of fill to permanent embankments and placing of surplus material to the designated landscape area. - Construction of structures crossing the outer loop

Year /Quarter (indicative only)	Phase	Construction works sequence
Washery		
		• Installation of permanent drainage • Placing of topsoil to batters • Construction of Permanent Way • Planting of landscaping and seeding within the appropriate season
Jan 2023 – Jan 2025 (1 st 2023 Qtr onwards)	Phase 4 (Nant Helen)	• Erection of temporary protective and permanent fencing • Undertake tree clearance works • Construct permanent Sustrans Cycle Track diversion route and divert cyclists • Stripping of existing soils and place into temporary stockpiles (Last Quarter 2022) • Installation of temporary drainage measures and excavation of the 5No permanent attenuation ponds to be used as temporary settlement ponds • Excavation of cuttings, placing of fill to permanent embankments and placing of surplus material to the designated landscape area. • Installation of permanent drainage and cascades • Placing of topsoil to batters • Construction of Permanent Way • Planting of landscaping and seeding within the appropriate season
Jan 2024 – Dec 2024 (1 st Qtr 2024 onwards)	Phase 3 (Nant Helen)	• Erection of temporary protective and permanent fencing • Protection works to the Scheduled Monument in line with the approved Consent • Grounding of overhead WPD power cables • Stripping of existing soils and place into temporary stockpiles (3rd quarter 2023) • Installation of temporary drainage measures and excavation of the 5No permanent attenuation ponds to be used as temporary settlement ponds

Year /Quarter (indicative only)	Phase	Construction works sequence
		Washery
		- Excavation of cuttings, placing of fill to permanent embankments and placing of surplus material to the designated landscape area. - Installation of permanent drainage - Placing of topsoil to batters - Construction of Permanent Way - Planting of landscaping and seeding within the appropriate season

Table 3 Earthworks and development programme

Phasing	Area	Task	Anticipated Start (indicative)	Anticipated Finish (indicative)
Phase 1A	Washery	Earthworks	Feb 23	May 23
		Drainage	April 23	May 23
		Track and rail infrastructure	May 23	June 23
		Commissioning	June 23	July-23
		Sidings enter operation	July-23	July-23
Phase 2A	Washery	demolition	July 2023 - Dec 2024	July 2023 - Dec 2024
		earthworks	Jul-23	Dec-23
		Drainage	Jul - 23	Dec-23

Phasing	Area	Task	Anticipated Start (indicative)	Anticipated Finish (indicative)
		Track and rail infrastructure	2024 TBC	2024 TBC
		Testing and Commissioning	2024 TBC	2024 TBC
		Site infrastructure (Roads / Drainage / Services)	2024 TBC	2024 TBC
		Key buildings construction	2024 TBC	2024 TBC
		GCRE facilities washeries area enter operation	2024 TBC	2024 TBC
Phase 1	Test track loops	Earthworks and primary drainage	April 23	July 23
		Soil placement and landscaping	July 23	Sept 23
		Track and rail infrastructure	Nov-23	Jan-23
Phase 2	Test track loops	Vegetation clearance	Feb-23	March 23
		Temporary drainage	April 23	May 23
		Soil stripping	June 23	June 23
		Earthworks and primary drainage	July 23	Sept 23
		Soil placement and landscaping	Oct 23	Nov 23
		Track and rail infrastructure (including track drainage)	Jul 24	Sept 24
Phase 4		Vegetation clearance	Jan 23	March 23

Phasing	Area	Task	Anticipated Start (indicative)	Anticipated Finish (indicative)
		Temporary drainage	April 23	May 23
		Soil stripping	April 23	June 23
		Earthworks and primary drainage (including structure)	May 23	Sept 24
		Soil replacement and landscaping	Aug 24	Oct 24
		Track and rail infrastructure	Jul 24	Dec 24
		planting	Dec 24	Jan 25
Phase 3	Test track loops	Vegetation clearance	Jan-24	Feb-24
		SM protection measures	Jan-24	Feb-24
		Temporary drainage	Jan-24	Feb-24
		Soil stripping	Mar-24	Apr-24
		Earthworks and primary drainage (including structure)	Apr-24	Jul-24
		Soil placement and landscaping	Aug-24	Aug-24
		Track and rail infrastructure	Aug-24	Dec-24
Remaining areas	Test track loops	Vegetation clearance	March 23	April 23
		Temporary drainage	April 23	June 23

Phasing	Area	Task	Anticipated Start (indicative)	Anticipated Finish (indicative)
		Soil stripping	June 23	July 23
		Earthworks and primary drainage	July 23	Dec 24
		Soil placement and landscaping	Apr 25	Jun 25
Commissioning works			Jan-24	Jun-25
Entry into service				Jun-25
Monitoring and maintenance			Jun-25	onwards

1.9 Summary of the Ecological Baseline

- 1.9.1 Appendix 4 provides details of the methods used for ecology surveys undertaken to provide information on the 2018-2019 ecological baseline (to inform the Nant Helen Complementary Earthworks ES³ and GCRE ES¹).
- 1.9.2 A summary of the 2018-2019 ecology survey findings are detailed below in Table 4, along with an evaluation of their conservation significance. This summary has been taken from the GCRE ES. Additionally, Tables 5, 6 and 7 details the protected sites within the area, which were considered as part of the GCRE ES¹ and Nant Helen ES³.

Table 4: Ecology baseline (2018 / 2019 surveys)

Receptor	Summary	Evaluation	Notes
Habitats	Semi-improved acid grassland, neutral grassland, bracken, marshy grassland, dry heathland and acid grassland mosaic (including areas of unimproved acid grassland), improved grassland, short / ephemeral vegetation, dry heathland, poor semi-improved grassland, fen-mire, flushes, wet heathland, scrub, semi-natural broad-leaved woodland (including ancient woodland), mixed, conifer and broadleaved plantation, hedgerows (species poor), river and streams, standing water, swamp, dry and wet ditches.	County	Habitats present which qualify as UK BAP habitats, and Section 7 habitats. In addition, a number of LBAP habitats are also present. These habitats are protected by local and national planning policy. A number of these habitats are also considered to qualify the site as a Site of Importance for nature Conservation (SINC), in accordance with published guidelines⁸. These include those habitats above (i.e. UK BAP and Section 7 habitats) in addition to heath, acid grassland mosaic (where unimproved grassland), flushes, ponds and conifer plantation (which are not listed above as UKBAP/Section 7 habitats) due to being locally important habitats, or due to supporting important vascular plants. Examples of UK BAP/Section 7, SINC and LBAP habitats, other than the restored 5 ha peat bog on Nant Helen has species rich Section 7 habitats, are however relatively small in extent or species poor examples. Of these

⁸ Wildlife Sites Guidance Wales (Wales Biodiversity Partnership, 2008) - A Guide to Develop Local Wildlife Sites System in Wales

Receptor	Summary	Evaluation	Notes
	In addition, there are areas of quarry, bare ground, coal spoil, buildings, fences and areas of gravel and tarmac.		habitats for example marshy grassland occurs across the site but is species poor due to agricultural improvement and unsympathetic grazing regimes; the only species-rich examples of this habitat occur to the east of the Site in the washery. There are still examples of good quality habitats of conservation significance importance however within the Site, and which is reflected by the presence of notable plant species (and fungi, and invertebrates), and the high number of different habitats which occur together, albeit some of lower habitat quality, indicates that the Site (excluding areas subject to disturbances from current mining activities) would qualify as SINC under the 'Mosaic habitat' criteria. As such, it is considered that the Site is of County value for its habitats. It is noted however that some habitats particularly areas of quarry, bare ground, coal spoil, buildings, fences and areas of gravel and tarmac would be of Less than local value if considered separately.
Invertebrates	The Site supports notable invertebrates including species listed in the Red data book (identified as Nationally scarce including NT, Nb, N, NT9)	County	The Site supports species of conservation significance including S7 species and red data book. The Site is assessed as being of County Value, due to the presence of a high proportion of habitats which support a

⁹ **NT** - IUCN UK Red List, Near Threatened. A taxon is Near Threatened when it has been evaluated against the IUCN criteria and does not currently qualify for Critically Endangered, Endangered or Vulnerable status, but is close to qualifying, or is likely to do so soon; **Nb** – Nationally Scarce Category B. Taxa thought to occur in between 30 and 100 10 km squares of the National Grid; **NS** – Nationally Scarce. In more recent second status reviews, the Na and Nb sub-divisions have been subsumed into a single category covering species occurring in 16 to 100 10km squares of the National Grid. Unlike the previous 'N' category, which covered the same range, the amalgamation does not necessarily result from inadequate information on the British distribution; **pNS** – Provisional Nationally Scarce. The rove beetles *Hadrognathus longipalpis* and *Zyras collaris* will almost certainly be accorded Nationally Scarce status in the forthcoming Review of this group, but they have no formal conservation status currently.

Receptor	Summary	Evaluation	Notes
	categories), and as species of principal importance for conservation in Wales (i.e. Section 7 species) (S7). In accordance with published guidance. These include scarce blue-tailed damselfly (<i>Ischnura elegans</i>) (NT), a water beetle (<i>Helochares punctatus</i>) (NS), a rove beetle (<i>Hadrognathus longipalpis</i>) (pNs), weevils: <i>Anthonomus brunnipennis</i> (Nb), <i>Pelenomus waltoni</i> (Nb) and <i>Magdalis carbonaria</i> (Nb), dingy skipper (S7), double line moth (<i>Mythimna turca</i>) (Nb), a money spider (<i>Walckenaeria kochi</i>), money spiders: <i>Erigonella ignobilis</i> (NS) and <i>Agyneta olivacea</i> (NS), triangle hammock-spider (S7/NS). The majority of these species were recorded in small numbers in one or a few of the sampling areas within the Site. Dingy skipper (<i>Erynnis tages</i>) was recorded in higher numbers, and across the Site in open, ruderal vegetation and is considered to be an important population of this butterfly.		diverse invertebrate fauna including species of high conservation status.

Receptor	Summary	Evaluation	Notes
	The adjacent washery site supported a number of other notable invertebrates including the small blue (<i>Cupido minimus</i>), grayling (<i>Hipparchia semele</i>) and small pearl bordered (<i>Boloria selene</i>) butterfly.		
Amphibians	The site is known to support common toad (<i>Bufo bufo</i>), common frog (<i>Rana temporaria</i>), common and or smooth newt (<i>Lissotriton vulgaris</i>), which have been found in terrestrial habitat during reptile surveys.	Local	Common toad are a Section 7 species. As such the Site is assessed as being of Local value to amphibian populations.
Reptiles	Reptile presence / absence surveys recorded peak counts of 17 common lizard (<i>Zootoca vivipara</i>) and 2 slow worm (<i>Anguis fragilis</i>).	Local	These species are Section 7 species. All native reptiles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 with respect to killing, injury and sale only. As such, the Site is considered to be of Local Value to reptiles.
Breeding birds	Surveys recorded an assemblage of breeding birds typically associated with the habitat surveyed. Surveys recorded the following species: greater Canada goose (<i>Branta canadensis</i>), mallard (<i>Anas platyrhynchos</i>), common buzzard (<i>Buteo buteo</i>), lapwing	County	Of these species ten are included on the BoCCW 3 Red list, 12 on the BoCCW 3 Amber list with 14 being Section 7 species. One species (Common Crossbill) that is included on Schedule 1 of the Wildlife and Country 1981 (as amended) bred within the Study Area. In addition, three of these species are listed as 'Primary' species, and ten as 'Contributory' species in published

Receptor	Summary	Evaluation	Notes
	(<i>Vanellus vanellus</i>), curlew (<i>Numenius arquata</i>), woodpigeon (<i>Columba palumbus</i>), Eurasian collared dove (<i>Streptopelia decaocto</i>), cuckoo (<i>Cuculus canorus</i>), nightjar (<i>Caprimulgus europaeus</i>), great spotted woodpecker (<i>Dendrocopos major</i>), jay (<i>Garrulus glandarius</i>), magpie (<i>Pica pica</i>), jackdaw (<i>Corvus monedula</i>), carrion crow (<i>Corvus corone</i>), goldcrest (<i>Regulus regulus</i>), blue tit (<i>Cyanistes caeruleus</i>), great tit (<i>Parus major</i>), coal tit (<i>Periparus ater</i>), skylark (<i>Alauda arvensis</i>), long-tailed tit (<i>Aegithalos caudatus</i>), chiffchaff (<i>Phylloscopus collybita</i>), willow warbler (<i>Phylloscopus trochilus</i>), blackcap (<i>Sylvia atricapilla</i>), garden warbler (<i>Sylvia borin</i>), whitethroat (<i>Sylvia communis</i>), grasshopper warbler (<i>Locustella naevia</i>), sedge warbler (<i>Scrocephalus schoenobaenus</i>), wren (<i>Troglodytes troglodytes</i>), starling (<i>Sturnus vulgaris</i>), blackbird (<i>Turdus merula</i>), song thrush (<i>Turdus philomelos</i>), mistle thrush (<i>Turdus</i>		guidance³³, and therefore the site would qualify as SINC based on the presence of these species. One species, the nightjar (a BoCCW 3 Amber list, S7 and SINC 'Contributory' species) was recorded in cleared plantation woodland, south-west of the Site. On the current survey information to date, the site is assessed as being of County value for breeding birds. All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. Some rarer species (those listed under Schedule 1 of the Act) are afforded additional protection from disturbance when breeding. Barn owl is included on Schedule 1.

Receptor	Summary	Evaluation	Notes
	<i>viscivorus</i>), robin (<i>Erithacus rubecula</i>), redstart (<i>Phoenicurus phoenicurus</i>), stonechat (<i>Saxicola rubicola</i>), northern wheatear (<i>Oenanthe oenanthe</i>), dunnoek (<i>Prunella modularis</i>), house sparrow (<i>Passer domesticus</i>), pied wagtail (<i>Motacilla alba</i>), grey wagtail (<i>Motacilla cinerea</i>), tree pipit (<i>Anthus trivialis</i>), meadow pipit (<i>Anthus pratensis</i>), chaffinch (<i>Fringilla coelebs</i>), bullfinch (<i>Pyrrhula pyrrhula</i>), linnet (<i>Linaria cannabina</i>), lesser redpoll (<i>Carduelis cabaret</i>), goldfinch (<i>Carduelis carduelis</i>), siskin (<i>Spinus spinus</i>), yellowhammer (<i>Emberiza citrinella</i>) and reed bunting (<i>Emberiza schoeniclus</i>).		
Wintering birds	Surveys recorded the following species: greater Canada goose (<i>Branta canadensis</i>), mallard (<i>Anas platyrhynchos</i>), grey heron (<i>Ardea cinerea</i>), red kite (<i>Milvus milvus</i>), buzzard, snipe (<i>Gallinago gallinago</i>), woodpigeon, kestrel (<i>Falco tinnunculus</i>), magpie (<i>Pica pica</i>), jackdaw (<i>Coloeus monedula</i>), rook (<i>Corvus</i>	County	Overall, the assemblage of birds recorded is typical of habitats in upland areas of this part of Wales. No particularly rare species or large aggregations of species of conservation concern were recorded. Of the total of 34 species was recorded, three are included on the Birds BoCCW3 Red list, 12 are included on the BoCCW3 Amber list with seven being included on S7 of the Environment (Wales) Act 2016. In addition, seven of these species are listed as 'contributory' species in published guidance³³, and

Receptor	Summary	Evaluation	Notes
	<i>frugilegus</i>), carrion crow, raven (<i>Corvus corax</i>), blue tit (<i>Cyanistes caeruleus</i>), great tit (<i>Parus major</i>), skylark (<i>Alauda arvensis</i>), wren (<i>Troglodytes troglodytes</i>), starling, blackbird, fieldfare (<i>Turdus pilaris</i>), song thrush, redwing (<i>Turdus iliacus</i>), mistle thrush (<i>Turdus viscivorus</i>), robin (<i>Erithacus rubecula</i>), stonechat (<i>Saxicola rubicola</i>), dunnock (<i>Prunella modularis</i>), house sparrow (<i>Passer domesticus</i>), pied wagtail (<i>Motacilla alba</i>), meadow pipit (<i>Anthus pratensis</i>), chaffinch (<i>Fringilla coelebs</i>), linnet (<i>Linaria cannabina</i>), goldfinch (<i>Carduelis carduelis</i>) and reed bunting (<i>Emberiza schoeniclus</i>).		therefore the site would qualify as SINC based on the presence of these species. On the current survey information to date, the site is assessed as being of County value for wintering birds.
Badger	Badger (<i>Meles meles</i>) surveys recorded setts within the Site boundary. This included a three hole and five-hole subsidiary sett. None of the sett entrances had any signs of currently being used by badger, but a latrine was recorded in close proximity. An outlier sett, badger latrine and signs of digging by badger were also recorded in woodland outside	Less than Local	A number of badger setts have been recorded within / adjacent to the Site boundary in addition to a number of setts within the wider area. The Site is considered to be of Less than Local value to badgers. Although not rare, badgers are protected under the Protection of Badgers Act 1992 for welfare reasons and therefore are a potential ecological constraint within the site.

Receptor	Summary	Evaluation	Notes
	of the Site boundary, over 2 km to the south-west.		
Otter	Riparian mammal surveys identified a number of otter (<i>lutra lutra</i>) spraints along the Afon Dulais, therefore outside of the Site boundary. No natal dens or couches were identified within the Site, although a potential couch was identified south-west of the Site, along the Afon Dulais. It is possible, due to the large territories of otter, that they may occur within the site whilst foraging or commuting, although due to the exposed nature of the site, current levels of disturbance, lack of well stocked fishponds, this is considered likely to be infrequent.	Local	It is possible that they may occur within the Site, whilst commuting / foraging through the wider area but it is not considered to be used frequently by this species. Otter are a Section 7 species, and they are also listed in Powy's LBAP. Otters are fully protected by UK law under the Wildlife and Countryside Act 1981 (as amended) through inclusion in Schedule 5. Otter is also included in Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The site is assessed as being of Local value for otter.
Roosting bats	Various trees were identified during the field survey as having potential roosting features. Additionally, three trees with bat boxes were recorded in woodland in the west of the Site. A road bridge and railway bridge are present just outside of the Site boundary to the south-east of that Site that may also provide roosting opportunities for bats.	Local	The Site is considered to be of Local value for roosting bats, due to the potential for small numbers of common roosting bat species to occur within trees and buildings. It is acknowledged however that further surveys would be required for any trees affected, and if any rare or notable bat species and or significant numbers of any roosting bats are recorded within the site during these surveys, the Site's value for bats may increase.

Receptor	Summary	Evaluation	Notes
	Bat roost surveys undertaken in 2019 recorded no roosts within any trees / buildings within the Study Area; however, 12 trees retained low-moderate roost potential following the tree climbing assessment. A potential <i>Pipistrellus</i> sp. and Natterers (<i>Myotis nattereri</i>) bat roost was identified within an old tunnel during the bat roost surveys, as well as during the 2019 transect surveys at NGR SN80138 09411.		
Commuting / foraging bats	During transect surveys soprano and common pipistrelle were by far the most abundantly logged species, with records from each transect, in addition noctule and <i>Myotis</i> species were recorded. A minimum of eight bat species were recorded during static monitoring recorded, of these, common and soprano pipistrelle were by far the most commonly recorded, comprising 96.78% of all bat calls recorded. <i>Myotis</i> sp. and Noctule (<i>Nyctalus noctula</i>) were the next most commonly recorded species/species group. Of those species	County	On the current survey information to date, the site is assessed as being of County value for foraging/commuting bats, largely due to the presence of serotine and greater horseshoe bats, although it is acknowledged that this species are present infrequently and in lower numbers. All bat species are protected through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Eight of the UK's bat species are listed as Section 7 species.

Receptor	Summary	Evaluation	Notes
	identified to species-level, serotine (<i>Eptesicus serotinus</i>) (two passes, static monitoring locations 1 and 8) and greater horseshoe bat (an Annex II species), (five passes, static monitoring locations 3, 7, 9 and 16) provided the fewest records. Bat activity levels (and activity by rarer species: greater horseshoe (<i>Rhinolophus ferrumequinum</i>) and serotine) were highest at lower elevations and/or when near to optimal foraging habitat (e.g. woodland/water), and lowest at higher elevations and/or near to busier roads (as opposed to access tracks around the site).		
Notable mammals	Arboreal mammal surveys recorded polecat at one of the feeding stations (captured on video from trail camera deployed for this survey). Red squirrel (<i>Sciurus vulgaris</i>) and pine marten (<i>Martes martes</i>) were found likely to be absent from the survey area. Numerous other native UK species were recorded during	Local	The presence of polecat was confirmed during surveys at a feeding station outside of the Site boundary but is considered likely to occur throughout the site, in suitable habitats such as woodland including plantations. Polecat is a UKBAP/S7 and Powys LBAP species. Brown hare has also been recorded within the Site, which is also UKBAP/S7 and Powys LBAP species. Species such as the West European hedgehog which are considered likely to occur within the Site, are also a S7 species.

Receptor	Summary	Evaluation	Notes
	this suite of surveys, including red fox (<i>Vulpes vulpes</i>), rabbit (<i>Oryctolagus cuniculus</i>), and mice.		The above species, which are of conservation significance, occur within the Site, however are likely to be present in small numbers due to the limited habitat available. It is therefore considered that the site is of Local value for notable mammal species.
Invasive species	The site is known to support Japanese knotweed (<i>Fallopia japonica</i>), montbretia (<i>Crocasmia x crocosmiiflora</i>), rhododendron (<i>Rhododendron x superponticum</i>) and cotoneaster (<i>Cotoneaster spp.</i>).	Less than Local	Although not valued ecological receptor, as plants listed under Schedule 9 plants of the Wildlife and Countryside Act 1981 (as amended), it is an offence to spread them from the site.

Table 5: European Statutory designated sites within 15 km of the Site.

Site Name	Designation	Features	Approximate Distance and Orientation from Site
Coedydd Nedd a Mellte	SAC	Annex I habitats that are a primary reason for selection of this site include Old sessile oak woods with Ilex and Blechnum in the British Isles. Coedydd Nedd a Mellte is a very large and diverse example of old sessile oak wood in south Wales. The woods extend along a series of deeply incised valleys and ravines and contain complex mosaics of sessile oak <i>Quercus petraea</i> woodland, ash <i>Fraxinus excelsior</i> woodland (some of which is referable to Annex I type 9180 Tilio-Acerion forests of slopes, screes and ravines), and transitions to lowland woodland types. The whole site is biologically rich, with many woodland plant communities represented and rich bryophyte and lichen assemblages. Notable higher plant species include wood fescue <i>Festuca altissima</i> and the ferns <i>Dryopteris aemula</i>, <i>Hymenophyllum tunbrigense</i> and <i>Asplenium viride</i>.	2.9 km south-east
Cwm Cadlan	SAC	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caeruleae</i>) for which this is considered to be one of the best areas in the United Kingdom. Alkaline fens for which this is considered to be one of the best areas in the United Kingdom.	9.5 km east
Blaen Cynon	SAC	The SAC comprises four compartments. The site is designated for its population of marsh fritillary and is known to contribute towards supporting a metapopulation of the marsh fritillary in the Penderyn/Hirwaun area.	9.2 km to the east (closest compartment)

Table 6: Nationally Statutory designated sites within 5 km of the Site

Site Name	Designation	Features	Approximate Distance and Orientation from Site
Nant Llech	SSSI	The Nant Lech, flowing off the Millstone Grit rocks and on to Coal Measure shales has carved a steep-sided valley of special interest on account of its rich variety of woodland and cliff plant communities. A range of woodland types has formed in response to variations in soil moisture content and soil chemistry. Bird life is rich and the uncommon soldier beetle (<i>Podabrus alpinus</i>) has been recorded from the wood.	100 m north-east
Gors Llwyn, Onllwyn	SSSI	This site contains a range of peat-depositing vegetation communities. Peat deposition has been sufficiently great in part of the site to form a dome shaped mass of peat above the general water table, known as a raised mire. There are very few other examples of this formation known in mid and south Wales. North-east of the complex of mires is an area of acidic pasture. Drier ridges divide up a series of wet flushes which support a range of wetland species e.g. whorled caraway (<i>Carum verticillatum</i>), meadow thistle (<i>Cirsium dissectum</i>) and sharp-flowered rush (<i>Juncus acutiflorus</i>). These plants form a clearly defined community of extremely limited distribution in Europe, occurring only along the southern Atlantic seaboard.	40 m east
Caeau Ton-y-Fildre	SSSI	The site comprises two unimproved herb-rich pastures on the north bank of Nant y Bryn. The western field supports a wide range of species characteristic of damp, flushed peaty pasture, including globeflower (<i>Trollius europaeus</i>), meadow thistle, whorled caraway and marsh arrowgrass (<i>Triglochin palustris</i>). Notable species in the eastern field include greater butterfly-orchid (<i>Platanthera chlorantha</i>), saw-wort (<i>Serratula tinctoria</i>), dyer's greenweed (<i>Genista tinctora</i>) and petty whin (<i>G. anglica</i>). Over 100 species of flowering plants and ferns having been	260 m east

Site Name	Designation	Features	Approximate Distance and Orientation from Site
		recorded. The area also supports invertebrates, especially butterflies.	
Waun Ton-y-Spyddaden	SSSI	A series of small, unimproved, herb-rich hay meadows lying on a very gentle slope. The site demonstrates well the effects of traditional management on the moorland vegetation to be found on the better soils in this part of Wales. A vivid gradation in plant communities can be seen as the slope descends from north to south. At the top end is a typical moorland community of mat-grass (<i>Nardus stricta</i>), heath rush (<i>Juncus squarrosus</i>), deergrass (<i>Scirpus cespitosus</i>) and sheep's-fescue (<i>Festuca ovina</i>). This changes into grass heath communities of brown bent (<i>Agrostis canina</i>), red fescue (<i>Festuca rubra</i>), lousewort (<i>Pedicularis sylvatica</i>) and heath spotted-orchid (<i>Dactylorhiza maculata</i> spp. <i>ericetorum</i>), which in turn grade into purple moor-grass/sedge associations.	2.2 km north-east
Rhos Hen-Glyn-Isaf	SSSI	This site comprises an extensive and varied area of damp/wet heathy pasture above the valley of the River Giedd, near Ystradgynlais. It is noted for its wide variety of plant species, including several that are uncommon in Brecknock. A large part of the site supports a sward dominated by purple moor-grass, sedges and common cottongrass (<i>Eriophorum angustifolium</i>). Other species include bog pimpernel (<i>Anagallis tenella</i>), round-leaved sundew (<i>Drosera rotundifolia</i>), few-flowered spike-rush (<i>Eleocharis quinqueflora</i>), common butterwort (<i>Pinguicula vulgaris</i>) and devil's-bit scabious (<i>Succisa pratensis</i>). Additional interest is provided by stands of alder (<i>Alnus glutinosa</i>) and by ditches which support species such as hemp-agrimony (<i>Eupatorium cannabinum</i>), bogbean (<i>Menyanthes trifoliata</i>), bog pondweed (<i>Potamogeton polygonifolius</i>) and the locally uncommon fern (<i>Osmunda regalis</i>).	2.7 km north-west

Site Name	Designation	Features	Approximate Distance and Orientation from Site
Mynydd Du	SSSI	This is an important upland site of special interest for its vegetation, open water and birdlife. In addition to the Old Red Sandstone there are significant outcrops of Carboniferous Limestone and Millstone Grit. The summit ridges are notable for their extensive grassland, dominated in the main by matgrass. Small areas still support heather <i>Calluna vulgaris</i> and bilberry <i>Vaccinium myrtillus</i>. The north and east facing cliffs of Bannau Sir Gaer and Bannau Brycheiniog support an interesting arctic-alpine flora, with such species as northern bedstraw (<i>Galium boreale</i>), dwarf willow (<i>Salix herbacea</i>), lesser meadow-rue (<i>Thalictrum minus</i>) and roseroot (<i>Sedum rosea</i>), together with a rich moss and liverwort flora.	3 km north
Ogof Ffynnon Ddu	SSSI	The site contains part of an extensive cave system which has at least 40 kilometres of passages, the largest length in any Welsh cave, situated within a vertical range of 300 metres, which is the greatest in any cave in Britain. A number of rare crustacean species restricted to subterranean habitats are of particular note.	3.3 km north-east
Ogof Ffynnon Ddu - Pant Mawr	SSSI, NNR	The undulating upland plateau above the cave system supports the finest limestone pavement in mid and south Wales. It is rich in plant species, including such rarities as lily-of-the valley (<i>Convallaria majalis</i>), soft-leaved sedge (<i>C. montana</i>), mountain melick (<i>Melica nutans</i>), lesser meadow-rue (<i>Thalictrum minus</i>) and the nationally rare hairy greenweed (<i>Genista pilosa</i>). These areas of sheltered, deep heather provide suitable habitat for nightjar (<i>Caprimulgus europaeus</i>), offering probably one of the last breeding localities in Brecknock for this summer-visiting bird. Also present within the site are a number of peat-bottomed pools with a well-developed upland dragonfly and damselfly population.	3.3 km north-east

Site Name	Designation	Features	Approximate Distance and Orientation from Site
Nant y Rhos	SSSI	The site consists of a single, gently sloping enclosure on the west side of the Nant y Rhos, 2.5 km south-east of Ystalyfera, at an altitude of 140 m above sea level. The geology of this area comprises Middle Coal Measure shales, overlain for the most part by boulder clay. The site is of special interest for its species-rich fen meadow vegetation, which includes large populations of meadow thistle and whorled caraway. Most of the site supports vegetation that is dominated by purple moor-grass, accompanied by a range of characteristic associates including meadow thistle, flea sedge (<i>Carex pulicaris</i>), carnation sedge (<i>C. panicea</i>) and tawny sedge (<i>C. hostiana</i>).	3.5 km south-west
Craig y Rhiwarth	SSSI	The west-facing limestone escarpment of Craig y Rhiwarth on the east bank of the Afon Tawe, above Craig-ynnos, supports some of the finest limestone plant communities in Brecknock. The limestone is covered in places by acidic boulder clay, where communities of plants demanding more acidic conditions are confined and contrast with the calcicolous communities elsewhere. Areas of acidic glacial drift support contrasting oak and birch woodland and contribute to the great species diversity of the site, with over 170 species of higher plants and a similar number of lower plants known to grow here.	3.6 km north-east
Dyffrynnoedd Nedd a Mellte a Moel Penderyn	SSSI	Dyffrynnoedd Nedd a Mellte, a Moel Penderyn is of special interest for its extensive and diverse semi-natural woodland, important populations of several flowering plants and supporting outstanding assemblages of mosses, liverworts and lichens. The site includes a range of geological features, well-exposed in the cliffs and rocky riverbeds. These include exposures at Moel Penderyn, Craig y Ddinas and Bwa Maen and geomorphological features within parts of the valleys of the Hepste and Mellte are also of special interest.	2.9 km south-east

Site Name	Designation	Features	Approximate Distance and Orientation from Site
		This site includes the wooded valleys of the rivers Nedd and Mellte, and their tributaries above Pontneddfechan, as they pass through a Millstone Grit and limestone plateau, and Moel Penderyn, which lies to the east. The plateau lies at about 300 m, the rivers having eroded deep, narrow valleys with gorges, river cliffs, block scree and waterfalls.	
Caeau Nant y Llechau	SSSI	This is the largest area of traditional unimproved hay meadow known in Brecknock. The collection of gently sloping, south-east facing fields on the upper valley side of the Nedd support a wealth of plant species. Developed on boulder clay overlying millstone grit, flushed in part by springs and drained by a number of well wooded streams, the varying topography is reflected in the diverse flora, with over 110 species of higher plants recorded from the grassland areas.	4.5 km east

Table 7: Non-statutory designated sites within 1 km of the Site

Site Name	Designation	Features	Approximate Distance and Orientation from Site
Gorsllwyn Meadows	SINC	This site is mostly marshy grassland with areas of upland fen/swamp and wet woodland. The site as a whole contains at least 50 indicator species of purple moorgrass and rush pastures. notable species include marsh helleborine (<i>Epipactis palustris</i>), brookweed (<i>Samolus valerandi</i>), marsh arrowgrass, marsh cinquefoil (<i>Potentilla palustris</i>), Marsh pennywort (<i>Hydrocotyle vulgaris</i>), bogbean and water horsetail (<i>Equisetum fluviatile</i>).	Partially within the site boundary; occurs in the northern part of the Washery.
Onllwyn Coal Washery	SINC	A site of open mosaic on previously developed land adjacent to the Onllwyn Washery, which is largely made up of a raised area of reclaimed coal tip. The site supports over 82 plant species. Notable species include	Partially within the site boundary; occurs

Site Name	Designation	Features	Approximate Distance and Orientation from Site
		sand sedge (<i>Carex arenaria</i>), a significant indicator species of Open Mosaic Coal Tip Habitats.	in the north eastern part of the Washery
Dyffryn Cellwen	SINC	A small area of unimproved marshy grassland near Dyffryn Cellwen, which is grazed by horses. Part of the site is very wet and supports a significant population of marsh cinquefoil. Other notable species include marsh arrowgrass, whorled caraway, lesser skullcap (<i>Scutellaria minor</i>), sneezewort (<i>Achillea ptarmica</i>) and devil's-bit scabious (<i>Succisa pratensis</i>).	Within the site; occurs in the south eastern part of the Washery.
Intervalley Road, Banwen	SINC	This site comprised a marshy grassland field, crossed by a small ditch, an abandoned railway line supporting sparse species-rich neutral grassland and adjacent areas of marshy and species-poor semi-improved grassland with small areas of dense and scattered scrub and planted trees. The site was bordered to the east and north by roads and to the west by a line of trees and rugby ground.	Immediately adjacent; south of the Washery.
Adjacent to Gorsllwyn	SINC	The site comprises a series of fields supporting marshy grassland, acid grassland and semi-improved neutral grassland, bordered to the north by a small stream, the south and east by a road and open to the west. There is a small ditch to the south and small areas of dense and scattered scrub are present.	Immediately adjacent, north of the Washery.
Banwen Pond	SINC	This former colliery site includes marshy, acid and neutral grasslands, heath and scrub along with a large fishing pond and smaller wildlife ponds	500 m south of the Site.
Aberhenwaun Uchaf	SINC	The site supports extensive marshy grassland with areas of acid grassland, semi-improved neutral grassland and scattered scrub. The qualifying features include lowland meadow, lowland dry acid grassland and purple moor grass and rush pasture. Devil's bit scabious (<i>Succisa pratensis</i>) is also present.	350 m south.
Land behind Marigold Place	SINC	The site is dominated by purple moor grass with mosaics of wet heath and acid grassland. Qualifying features include purple moor grass and rush pasture, lowland meadows, lowland dry acid grassland and invertebrates	800 m south.

Site Name	Designation	Features	Approximate Distance and Orientation from Site
		including dingy skipper, marsh fritillary ad narrow-bordered bee hawkmoth (<i>Hemaris tityus</i>). Devil's bit scabious is also present.	

2 Biodiversity Design

2.1 Habitat Creation

- 2.1.1 The biodiversity design and mitigation strategy for the GCRE Site will be guided by the consented restoration plan for Nant Helen Complementary Earthworks Scheme (Appendix 5) together with the GCRE habitat and creation plan (Appendix 6). A description of habitat creation and enhancement is also provided in the Nant Helen Earthworks ES Ecology Chapter3 (specifically Sections 7.20 and 7.21 and 7.22), and the GCRE ES Ecology Chapter1 (Sections 7.21, 7.22 and 7.23).
- 2.1.2 The Nant Helen Complementary Earthworks scheme allows for the restoration of the Celtic Energy site post operation, through the creation of species rich acid grassland, grazed fields, hedgerows, woodland and wetland habitat. Broadleaved woodland will be created along the northern embankment of the earthworks, extending existing woodland to the east. Additionally, where complementary earthworks are undertaken to provide a plateau for GCRE railway infrastructure, acid grassland will establish and create a pioneering habitat for fungi, lichen and heathland. Where an overburden mound is constructed within the Nant Helen site, this will also be established with acid grassland, lichen, fungi and heathland. Retained marshy grassland and acid grassland between the embankments / cuttings will be enhanced through the creation of scrapes of varying depths and sizes, and inoculating grassland with propagules from existing heathland. Further enhancements will occur through the management of conifer woodland, to encourage a more species rich woodland, with predominantly native species.
- 2.1.3 A valley-mire and pond complex is also proposed to be created in the valley feature through the translocation of peat from elsewhere within the Site; together with the enhancement of the existing peatland mire habitat between the smaller track loop.
- 2.1.4 The GCRE habitat and creation plan builds on the Nant Helen Complementary Earthworks scheme and proposes habitat creation and enhancement in areas disturbed by the infrastructure associated with GCRE such as tracks, sidings and research facilities. The plan also includes habitats within the Washery site, which did not form part of the Nant Helen restoration / complementary earthwork proposals. The GCRE habitat creation and enhancement plan allows for the re-establishment of acid grassland around the sidings in Nant Helen and in the Washery, following the installation of infrastructure. The colliery spoil on Site is a mix of Carboniferous mudstones from disturbed areas, arisings from coal processing and ballast from the rail infrastructure. Re-use of the spoil within

the Site, particularly in the Washery around new sidings, will provide a diverse substrate for the establishment of an open mosaic habitat similar to that currently present, which comprises areas of short herb rich grassland, with lichens and mosses, scattered scrub and bare ground. Flora will be indicative of acidic but also calcareous soils. These areas will also support taller vegetation, open water and damp areas. New woodland will be created within the Washery and Nant Helen, to provide a screening function to local residents but also biodiversity value through the planting of native broadleaved tree species. Other new habitats created will include wetland habitat through Sustainable Drainage Systems (SuDS). Although primarily for drainage purposes, the SuDS ponds will be designed to provide biodiversity value by incorporating features such as gently sloped edges and ledges. Vegetation around the SuDS will be allowed to regenerate naturally and over time will provide biodiversity enhancement on the Site as plant communities establish. Further habitat enhancements will also occur within the Washery and Nant Helen site through the management of retained mixed, conifer and broadleaved woodland, and of retained acid and marshy grassland, including areas which form part of local Sites of Importance for Nature Conservation (SINC) (i.e. Gorsllwyn meadows SINC and Onllwyn Coal Washery SINC). These habitats will be managed to encourage species diversity.

- 2.1.5 The GCRE habitat and creation plan (Appendix 6, Figure 7.9 (part two) within the GCRE ES1) also details proposals for species mitigation and enhancements. An indicative reptile receptor area is shown, which is proposed for use by reptiles displaced during trapping and relocation exercises planned prior to Site clearance, together with bird and bat boxes. New planting around the periphery of infrastructure will provide wildlife corridors to retain habitat connectivity across the Site and wider landscape.
- 2.1.6 All retained and newly created habitats will be subject to long term management to enhance their value for biodiversity. Management will be detailed within a separate Ecological Management and Monitoring Plan (EMMP)¹⁰.
- 2.1.7 The two schemes will be integrated in the future and the mitigation and enhancement measures described in the habitat and creation plan for the GCRE Site and restoration plan for Nant Helen Complementary Earthworks Scheme will be reconciled. The measures that are feasible and deliverable and beneficial for biodiversity across the combined scheme, will be identified and included in the PBPs.

¹⁰ Yet to be produced

2.2 Agreed Enhancements within the ES

- 2.2.1 Biodiversity enhancements are outlined in the habitat creation and enhancement plans for GCRE and Nant Helen (Appendix 5 and 6), as well as indicative locations shown on the specific species enhancement plan for GCRE (see Appendix 7).
- 2.2.2 Retained and newly created habitats within the Washery and Nant Helen site, to the south of Phase 2a development (Appendix 5 and 6) will be enhanced through their long-term management. In addition to mitigating / compensating for habitat loss across the Site, such long-term management should provide the opportunity for the creation of more diverse, species rich habitats, and therefore enhancements. In particular, enhancements of marshy grassland and short ruderal grassland habitats, which provide greater benefits to biodiversity including notable species within the Site. Long term management will be detailed within the site's EMMP.
- 2.2.3 Opportunities will also be sought to create green / brown roofs on buildings within the Washery,
- 2.2.4 Details of habitat creation and enhancements are provided in Section 3.

2.3 Calculations

- 2.3.1 Table 8 below sets out the extent of proposed areas of habitat loss, creation and enhancement for the Nant Helen Complementary Earthworks scheme; and Table 9 below sets out the extent of habitat creation and enhancement proposed for the GCRE scheme. These calculations are illustrative and are subject to revision once the measures within each PBP are finalised.

Nant Helen Complementary Earthworks

- 2.3.2 Habitat loss was calculated across areas where the proposed new embankments and cuttings disturb the existing baseline habitats (2018-2019). In addition, habitat loss was calculated where areas of the proposed new embankments / cuttings disturbed newly created habitats (formed as part of the Celtic Energy post mining restoration habitats (as detailed within the previous ES4); which were assumed to be in place at the time of the earthworks commencing.
- 2.3.3 Habitat gain including creation and enhancement was calculated based on new habitats proposed as part of the Nant Helen Complementary Earthworks project (as shown in Appendix 5), and excluded those habitats already proposed as part of the Celtic Energy application for the site's restorations post closure of mining operations; therefore, habitat gain only accounted for 'additional' habitat creation and enhancements.

GCRE Project

- 2.3.4 Habitat loss was calculated where areas of the proposed GCRE infrastructure disturbed the 'Future baseline' which encompassed the Celtic Energy mining restoration habitat creation and the Nant Helen Complementary Earthworks habitat creation (as discussed above in Section 1.5); due to the understanding that the Nant Helen Complementary Earthworks / Celtic energy restoration would have commenced, and habitats as proposed in the agreed Nant Helen habitat creation and enhancement plan will be in place the future baseline is further discussed in Appendix 10.
- 2.3.5 Habitat creation and enhancement has been calculated based on the new habitats proposed as part of the GCRE scheme (as shown in Appendix 6). These habitat creation and enhancement proposals complemented the agreed Nant Helen Complementary earthworks and Celtic Energy restoration plan. Similarly, calculations for Nant Helen Complementary earthworks; calculations for habitat gain excluded any habitats proposed as part of the Nant Helen complementary earthworks and Celtic Energy restoration.
- 2.3.6 As detailed within the GCRE ES1. This doesn't include calculations for buildings and areas of hardstanding or bare ground, and excludes the habitats proposed as part of the Nant Helen Restoration plan (which form part of the previous earthworks application). It should also be noted that calculations are approximate since they are based on approximate GIS polygons within the Future baseline plan (Appendix 9) and the habitat creation/enhancement plan (Appendix 6)1.

Table 8: Total area of habitats lost before and after construction, for a) the baseline i.e. existing site and b) the future baseline i.e. the restored site for Nant Helen Complementary Earthworks.(subject to revision on completion of each detailed Phase Biodiversity Plan),

Habitats affected (excluding buildings and hardstanding)	Area lost in Hectares (Ha) – Baseline (from earthworks)	Area lost in Hectares (Ha) – Restored site (from earthworks). Includes existing habitats to be retained ¹¹	Total habitat loss (baseline and restored site) ¹²	To Create (of greater value) ¹³	To Enhance	Create and enhance total
Broadleaved woodland	2.10	0.07	2.17	31.1	0	31.1
Conifer woodland	6.32	0	6.32	0	7.85	7.85
Mixed woodland plantation ¹⁵	1.90	0	1.90	0	0	0
Scrubscattered ¹⁴	1.02	0	1.02	0		0
Semi-improved acid grassland ¹⁴	15.11	10.37	25.48	0	18.95	18.95
Improved grassland ¹⁵	0.80	0	0.8	0	0	0
Enclosed pasture (for grazing)	0	1.32	1.32	19.3	0	19.3

¹¹ Some habitats listed as having 0 ha are not included as proposed habitats within the restored site.

¹² Of limited value for nature conservation.

¹³ For earthworks project only (additional habitats to be created as part of the restoration scheme).

¹⁴ Includes fungi-rich grassland of county value for nature conservation.

Habitats affected (excluding buildings and hardstanding)	Area lost in Hectares (Ha) – Baseline (from earthworks)	Area lost in Hectares (Ha) – Restored site (from earthworks). Includes existing habitats to be retained ¹¹	Total habitat loss (baseline and restored site) ¹²	To Create (of greater value) ¹³	To Enhance	Create and enhance total
Marshy grassland	34.54	0	34.54	0	40 (enclosed loop area – subject to management)	40
Poor semi-improved grassland ¹⁵	0.19	0	0.19	0	0	0
Dry heath/acid grassland (lichen and fungi habitat)	3.41	0	3.41	82 (areas of cutting/embankment and top overburden mound)	19 (enclosed loop/area existing heathland/acid grassland – subject to management)	101
Standing water	0.52	0.44	0.96	3.92	0	3.92
Watercourse	0.65	0.03	0.68	0	0 (natural channels likely to form in new topography)	0
Fen-mire complex (including open	3.35	0	3.35	4 (including additional ponds)	0	4

¹⁵ Not considered to be of significant value for nature conservation.

Habitats affected (excluding buildings and hardstanding)	Area lost in Hectares (Ha) – Baseline (from earthworks)	Area lost in Hectares (Ha) – Restored site (from earthworks). Includes existing habitats to be retained ¹¹	Total habitat loss (baseline and restored site) ¹²	To Create (of greater value) ¹³	To Enhance	Create and enhance total
water, wet and dry heath)						
Quarry ¹⁵	1.15	0	1.15	0	0	0
Spoil ¹⁵	0.16	0	0.16	0	0	0
Ephemeral/short perennial ¹⁵	3.53	0	3.53	0	0	0
Tarmac surface ¹⁵	0.62	0	0.62	0	0	0
Total	74.75	12.85	87.6	140.32	85.8	226.12

Table 9: Table summarising loss per habitat type against habitat creation and habitat retention (for GCRE).

Habitats affected (excluding buildings and hardstanding)	Total extent of habitat within red line boundary of GCRE	Habitat loss (Ha)	Habitat creation (ha)	Habitat retention and enhancement (Ha)	Habitats retained and protected (Ha) – not subject to management as a result of the proposed development	Description of changes to habitat
Marshy grassland	139.98	17.80	16.91	10.05 (existing SINC)	34.74	Small areas of marshy grassland will be lost from the sidings and the Nant Helen site as a result of GCRE infrastructure and the access road. A small area of marshy grassland will also be lost as a result of landscaping planting required for GCRE. There will be no loss of marshy grassland from the washery site, and these areas will be retained and subject to management to enhance their value for nature conservation.
Acid grassland	231.94	51.33	55.72	12.01 (existing SINC)		Small areas of acid grassland will be lost from the washery and sidings and the Nant Helen site as a result of the GCRE infrastructure. A small area of acid grassland will also be lost as a result of landscaping planting required for GCRE. There will be larger area of acid grassland lost from the Nant Helen site at the locations of the tracks, where there will be newly establishing grassland on the recently formed earthworks. An area of existing acid grassland which forms the Onllwyn coal washery SINC will be retained and subject to long term management to enhance its value for nature conservation. New acid grassland will establish on the embankments and cuttings of

Habitats affected (excluding buildings and hardstanding)	Total extent of habitat within red line boundary of GCRE	Habitat loss (Ha)	Habitat creation (ha)	Habitat retention and enhancement (Ha)	Habitats retained and protected (Ha) – not subject to management as a result of the proposed development	Description of changes to habitat
						the tracks within the Nant Helen site replacing lost acid grassland and woodland which forms part of the landscaping for the Nant Helen earthworks application.
Neutral grassland	1.76	1.76				A small area of neutral grassland which is present around the periphery of the washery buildings will be lost as a result of GCRE infrastructure: buildings and access road.
Dry heath / acid grassland	24.11	0.98				A small area of dry heath / acid grassland will be lost from the Washery.
Enclosed pasture	62.82	4.17				A small area of enclosed pasture will be lost as a result of landscaping planting required for GCRE.
Mixed woodland	4.18	0.76		1.98		A small area of mixed woodland (semi-natural and plantation) will be lost from the washery and the sidings as a result of GCRE infrastructure including the access road. A small area of plantation which is retained in the washery will be subject to management to enhance its value for nature conservation.

Habitats affected (excluding buildings and hardstanding)	Total extent of habitat within red line boundary of GCRE	Habitat loss (Ha)	Habitat creation (ha)	Habitat retention and enhancement (Ha)	Habitats retained and protected (Ha) - not subject to management as a result of the proposed development	Description of changes to habitat
Broadleaved woodland ¹⁶	27.11	18.96	42.04		2.51	New planting proposed as part of the Nant Helen earthworks habitat creation and enhancement will be lost where it is located on the northern track. There will be new broadleaved woodland creation as part of landscaping that is required for GCRE.
Conifer	2.60				2.60	An area of conifer will be retained north of the main track.
Scrub	2.13	1.62				A small area of scrub will be lost from the washery site.
Ephemeral vegetation	5.30	5.30				A small area of ephemeral vegetation will be lost from the washery site.
Waterbodies / wetland features	8.70	1.86	50.90			Three ponds located within the smaller GCRE track will be disturbed/lost as a result of the access track but will be relocated east of the track. There are a large number of waterbodies and wetland features such as ditches/swales that will be created for GCRE as part of the SuDS design.
Total	505.56	104.54	165.57	24.04	39.85	

¹⁶ including new planting lost from Nant Helen habitat creation and enhancement plan, and new landscaping comprising broadleaved woodland planting.

2.4 Contingency / changes to Habitat Creation and Enhancement proposals

- 2.4.1 The habitat creation and enhancements outlined in Section 3 are in accordance with those proposed in the GCRE ES¹ and Nant Helen Complementary Earthworks ES, but as the scheme design develops for each phase it will be necessary to maintain a flexible approach to ensure benefits are realised should opportunities present themselves. Furthermore, habitat creation and enhancement plans will need to be informed by updated surveys (see Section 5) and changes may be required to ensure that impacts are sufficiently mitigated for. The final details will be incorporated into the relevant PBP.
- 2.4.2 Significant changes will be agreed with the Local Planning Authority ecologists through submission of the latest survey results, landscaping proposals and updated habitat creation and enhancement plans. It is envisaged that Phase-specific Biodiversity Plans will be produced further to the completion of updated surveys, which detail the final proposed mitigation and enhancements, ensuring this accounts for the up-to-date ecological baseline.

2.5 Indicative programme for Habitat creation and habitat / species enhancements

- 2.5.1 An indicative programme is provided below (Table 10) which sets out the how habitat creation and habitat / species enhancements will be delivered per phase. This includes habitat creation and enhancement within the site, and adjacent receptor areas. Appendix 15 details the indicative extent of habitat creation / enhancement measures to be delivered per phase (phases 1A-2A in the Washery and 1-4 in Nant Helen) based on the original habitat creation and enhancement plans (Appendix 5 and 6).
- 2.5.2 Final mitigation measures will be detailed within subsequent Phase- specific Biodiversity Plans; however, these measures will generally be in accordance with the programme set out below, and the design principles described in Section 3.
- 2.5.3 Initial works will take place to receptor areas which are within ownership of GCRE Ltd, but outside of the construction areas. Enhancements to these areas will ensure they are suitable for the translocation of species namely reptiles and notable plants (the specific details of translocations will be provided within EPPs). These areas should be suitable for the translocation of species prior to any habitat clearance within each phase of development. Further details will be provided with subsequent phase specific Biodiversity