

Global Centre of Rail Excellence

Ecological Protection Plan- Nant Helen

GCRE Ltd

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Notice

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The information which Atkins Limited has provided has been prepared by an environmental specialist in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management. Atkins Limited confirms that the opinions expressed are our true and professional opinions.

This document does not purport to provide legal advice.

This report contains information regarding European badger, *Meles meles*, and therefore must be treated as confidential due to persecution faced by badger.

This document has 48 pages including the cover.

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1. Introduction

Atkins, member of the SNC-Lavalin Group, was commissioned by Walters, as part of a Stage 1 Design for a D&B construction, to produce an Ecological Protection Plan (EPP) in connection with the proposed Global Centre of Rail Excellence (GCRE) (hereafter referred to as the Scheme).

This EPP details the Construction Activities and ecological constraints identified at the Nant Helen Site and necessary further measures that need to be undertaken. This EPP contains information intended to discharge Powys County Council (PCC) Condition 11 and Neath Port Talbot Borough Council (NPTCBC) Condition 9 (provided below in Section 1.1.3 for reference).

The Construction Activities for the Scheme are split into; earthworks, diversion of a 33 / 11KV cable, creation of earth stockpiles and the potential reduction of the overburden mound. Collectively these are referred to as the Construction Activities and the area they impact is referred to as the Construction Footprint. A suite of ecological surveys have been undertaken to date, providing information on the current ecological conditions at the Nant Helen Site.

This document should be read in conjunction with the following documents:

- Ecological Update Walkover Survey¹
- Botanical Report²
- Protected Species Report³
- Precautionary Method of Working (PMW) for polecat, amphibians, badger, bat, brown hare, hedgehog, invasive non-native plant species, nesting birds, otter and water vole at the Nant Helen Site⁴.

This document is a live document and will be updated following the results of upcoming surveys, detailed within this report, and significant changes to the programme or the Construction Activities.

1.1.1. Site Description

The Nant Helen Site is located between the villages of Onllwyn, Abercraf and Ystragynlais, within the Dulais Valley located within Powys and Neath Port Talbot, approximately 20 km northeast of the city of Swansea.

The Nant Helen Site boundary, as it is understood, is shown in Appendix A. The Nant Helen Site's central Ordnance Survey national grid reference is SN 82620 11296.

The Nant Helen Site measures approximately 416 hectares and comprises the former Nant Helen open cast mine, which ceased operation in June 2022.

1.1.2. Proposed Scheme

The Scheme is a combined development, planned to encompass two test railway tracks of loop configuration: an electrified high speed rolling stock test track of 6.9 km in length and an electrified low speed infrastructure test track of 4.5 km, with overhead line equipment (OLE). The initial development by Celtic Energy Ltd – referred to as the Nant Helen Complementary Earthworks Scheme ('the Scheme') – comprises large-scale earthworks, including earth movement and land reclamation, leaving a suitably engineered and landscaped landform to receive the test track and associated infrastructure to be developed by GCRE. The Scheme also encompasses the diversion of a 33/11KV cable, creation of earth stockpiles and the potential reduction of an overburden mound.

The Scheme will be delivered in phases. The Scheme was granted conditional planning approval in July 2020 under two planning applications submitted to PCC and NPTBC.

The planning permission reference numbers for these permissions are:

- PCC – 20/0738/FUL⁵; and

¹ Atkins (2023) Ecological Updated Walkover Survey. Nant Helen Site. Global Centre of Rail Excellence. GCRE Limited.

² Atkins (2023) Botanical Survey Report. Nant Helen Site. Global Centre of Rail Excellence. GCRE Limited.

³ Atkins (2023) Protected Species Report. Nant Helen Site. Global Centre of Rail Excellence. GCRE Limited.

⁴ PMW for the Nant Helen Site Earthworks, Diversion of the 33/11 kv cables, creation of stockpiles and reduction of the overburden mound. Yet to be produced.

⁵ 20/0738/FUL | Construction of complementary restoration earthworks to create 2 looped landform platforms (part in cutting and part on embankment) with associated drainage infrastructure and areas of landscaping and habitat creation to create a flexible and adaptable area

- NPTBC – P2020/0362⁶.

The Scheme is to be being delivered in parallel with the submission of a subsequent planning application by GCRE, for further site clearance and development of associated infrastructure on the Nant Helen Site and an adjacent area comprising Onllwyn and known as 'The Washery'.

The Scheme plan incorporating all Construction Activities that make up the Scheme, as they are currently understood, is shown in Appendix B.

1.1.3. Planning Conditions

The planning conditions from PCC⁷ and NPTBC⁸ which are addressed in this document are detailed below.

1.1.3.1. PCC 20/0738/FUL Planning Condition 11

"No development shall take place (including demolition, ground works, vegetation clearance) until an Ecological Protection Plan (EPP) has been submitted to and approved in writing by the local planning authority. The EPP shall include the following.

- Risk assessment of potentially damaging construction activities.
- Details of Pre-commencement Surveys, including methodologies and timing.
- Identification of "biodiversity protection zones" .
- Reptile trapping and relocation method statement including details of receptor sites.
- Vascular Plant Species translocation method statements (specifically common wintergreen, lesser bulrush, floating bur-reed, greater tussock sedge and spiked water milfoil, royal fern and viviparous fescue).
- Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts to retained features of ecological importance during construction (may be provided as a set of method statements).
- The location and timing of sensitive works to avoid harm to ecological features of importance.
- The times during construction when specialist ecologists need to be present on site to oversee works.
- Responsible persons and lines of communication.
- The role and responsibilities on site of an ecological clerk of works (ECow) or similarly competent person.
- Use of protective fences, exclusion barriers and warning signs.

The approved EPP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority."

1.1.3.2. NPTBC P2020/0362 Planning Condition 9

"No development shall take place (including ground works and vegetation clearance) until an Ecological Protection Plan (EPP) has been submitted to and approved in writing by the local planning authority. The EPP shall include the following.

- Risk assessment of potentially damaging construction activities.
- Details of Pre-commencement Surveys, including methodologies and timing.
- Identification of "biodiversity protection zones".

of land that could be used for a variety of uses including agriculture, nature conservation, leisure, tourism and industrial, research and development/business uses (potentially including a proposed rail testing, research and development and storage facility). (Cross-boundary application, see Neath Port Talbot CC Application ref. P2020/0362) | Land At And Surrounding Nant Helen Open Cast Coal Site Powys And Onllwyn Distribution Centre, Neath Port Talbot

⁶ P2020/0362 | Construction of complementary restoration earthworks to create 2 looped landform platforms (part in cutting and part on embankment) with associated drainage infrastructure and areas of landscaping and habitat creation to create a flexible and adaptable area of land that could be used for a variety of uses including agriculture, nature conservation, leisure, tourism and industrial, research and development/business uses (potentially including a proposed rail testing, research and development and storage facility). (Cross-boundary application - see Powys CC Application ref. 20/0738/FUL) | Land At And Surrounding Nant Helen Open Cast Coal Site Powys & Onllwyn Distribution Centre Neath Port Talbot (npt.gov.uk)

⁷ Powys (2020) Application 20/0738/FUL for Full Planning Permission. Condition 11.

⁸ Neath Port Talbot County Borough Council (2020) Approval of Full Planning Permission. Application no. P2020/0362. Condition 9.

- Reptile trapping and relocation method statement including details of receptor sites.
- Vascular Plant Species translocation method statements (specifically common wintergreen, lesser bulrush, floating bur-reed, greater tussock sedge and spiked water milfoil, royal fern and viviparous fescue).
- Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts to retained features of ecological importance during construction (may be provided as a set of method statements).
- The location and timing of sensitive works to avoid harm to ecological features of importance.
- The times during construction when specialist ecologists need to be present on site to oversee works.
- Responsible persons and lines of communication.
- The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.
- Use of protective fences, exclusion barriers and warning signs.

The approved EPP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details.

Reason:

To comply with Neath Port Talbot Council Policies SP15, SP16, EN6 and EN7 in relation to the Natural Environment and meet the requirements of Planning Policy Wales (Edition 10, December 2018), TAN 5: Nature Conservation and Planning and Part 1 Section 6 of the Environment (Wales) Act 2016”.

2. Details of Pre-Commencement Surveys

The surveys detailed below were undertaken within the Nant Helen Site Boundary as updates or supplementary to the surveys previously undertaken to inform the environmental impact assessment⁹. The Nant Helen Site Boundary encompasses all aspects of the Scheme including the earthworks, haul routes, diversion of the 33/11KV cable, creation of the earth stockpiles and potential reduction of the overburden mound, as well as retained areas outside of the Scheme. The survey area for each of the pre-commencement surveys varies slightly, depending on the ecological zone of influence and suitable habitat for each species, and therefore details of the survey area for each survey type are given within the relevant methodologies below.

2.1. Ecological Update Walkover Survey

2.1.1. Methodology

A walkover survey of areas within the Nant Helen Site Boundary, with a visual assessment of areas up to 50 m adjacent, was undertaken over five days between 09/06/2022 and 16/06/2022 using the standard published methodology¹⁰ as guidance. The survey recorded information on the habitats within the Nant Helen Site Boundary and adjacent land and also included a search for evidence of the presence of, and the suitability of each habitat to support protected and priority species as recommended by CIEEM¹¹. The full Ecological Update Walkover Survey report (Updated Walkover) can be found in Appendix C.1.

This survey method comprised mapping habitats present according to the JNCC Phase 1 habitat survey methodology¹⁰, with target notes (TN) used to record features of ecological importance (e.g. waterbodies, complex habitat mosaics). In addition, the survey included an assessment of the suitability of the habitats for, or signs of, the following species (in line with current guidance):

- Amphibians (terrestrial and aquatic habitats);
- Bats¹², including initial assessment of the structures and trees within the Nant Helen Site Boundary and adjacent land from the ground-level. Overall roosting suitability of any structures and trees was assigned 'Negligible', 'Low', 'Moderate' and 'High' according to Bat Conservation Trust (BCT) guidelines;
- Badger;
- Breeding and wintering birds;
- Hazel dormouse¹³;
- Common species of reptiles¹⁴;
- Priority invertebrates¹⁵;
- Water vole¹⁶, otter and white-clawed crayfish¹⁷;
- Arboreal mammals, notably pine marten, red squirrel and polecat; and
- Other priority species¹⁸.

Evidence of the presence of the following invasive species was recorded where seen:

- Evidence of animal species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019; Chinese mitten crab, red swamp crayfish, signal crayfish, spiny cheek crayfish, muntjac deer, ruddy duck, Egyptian goose and grey squirrel;

⁹ Arup (2020) Nant Helen Complimentary Restoration Earthworks Environmental Statement. Celtic Energy Limited

¹⁰ Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit.

¹¹ CIEEM (2017) Guidelines for preliminary ecological appraisal. 2nd Edition.

¹² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

¹³ English Nature (2006). The Dormouse Conservation Handbook (2nd edition).

¹⁴ Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife advice sheet 10

¹⁵ As relevant to the location, identified through the desk study

¹⁶ Dean, M. et al The Water Vole Mitigation Handbook (2016). Mammal Society.

¹⁷ Peay S. (2003) Monitoring the White-clawed Crayfish *Austropotamobius pallipes* Conserving Nature 2000 Rivers Monitoring Series No. 1.

¹⁸ English Nature, Peterborough.

¹⁸ TN were also used to record incidental sighting, including other priority species, e.g. brown hare

- Evidence of the presence of the following invasive species: Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, and cotoneaster. These are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control; and
- In addition to those listed above, evidence of the presence of plant species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019 was recorded: Nuttall's waterweed, Chilean rhubarb, floating pennywort, curly waterweed and parrot's feather, fanwort, water hyacinth and floating water primrose.

2.1.2. Results

The Updated Walkover report reviewed previous survey data from the Nant Helen Site, including surveys conducted between November 2018 - 2022. The Updated Walkover conducted by Atkins in 2022 recorded suitable habitat for protected and priority species within the Nant Helen Site, including badger, amphibians including great crested newts, otter, water vole, hazel dormouse, widespread species of reptiles, bats, breeding and wintering birds, hedgehog, polecat and brown hare.

Habitats identified during this survey included broadleaved semi-natural woodland, waterbodies, fen, species-rich intact hedge, plantation coniferous woodland, dry dwarf shrub heath, marshy grassland and watercourses.

Invasive non-native plant species were also identified on the Site.

Following the walkover survey the following further surveys have been undertaken, with the methodologies and results given below:

- Notable plants¹⁹- additional botanical surveys (detailed in Section 2.2);
- Badgers- updated badger walkover survey to identify setts (detailed in Section 2.3);
- Bats- ground level tree assessments, aerial tree inspections (detailed in Section 2.4);
- Otter- updated otter surveys (detailed in Section 2.5);
- Water voles- updated water vole surveys (detailed in Section 2.6);
- Great crested newt (GCN)- Habitat Suitability Index (HSI) surveys (detailed in Section 2.7); and
- Reptiles- updated reptile survey (detailed in Section 2.8).

Further surveys for hazel dormouse, bat surveys including hibernation surveys and activity surveys, water vole surveys and GCN eDNA surveys will be undertaken during 2023 (detailed in Section 2.9).

2.2. Botanical Survey

2.2.1. Methodology

Botanical scoping surveys were undertaken between 07/11/2022 - 17/11/2022. These surveys included the search for the seven target species listed in the Scheme's planning conditions, comprising common wintergreen (*Pyrola minor*), lesser bulrush (*Typha angustifolia*), floating bur-reed (*Sparganium angustifolium*), spiked water-milfoil (*Myriophyllum spicatum*), royal fern (*Osmunda regalis*), greater tussock-sedge (*Carex paniculata*) and viviparous sheep's-fescue (*Festuca vivipara*). Individual and / or groupings of target species were mapped with use of point and polygon data to inform the overarching translocation strategy for any recorded species.

Potential receptor sites were selected based on their locations away from the Construction Activities and were assessed through a survey of the broad habitat types found in each site. As the surveys were undertaken in November, which is outside of the main plant growing season, a precautionary approach has been taken with the results of the botanical survey.

The survey also sought to assess the likely presence of Section 7 Priority and Annex I habitats within the survey area.

The survey area comprised:

¹⁹ Notable plants are those listed under the Welsh Red List (A Vascular Plant Red Data List for Wales, Dr Trevor Dines, Plantlife Wales, June 2008); South Wales Wildlife Sites Guidelines (Guidelines for the Selection Of Wildlife Sites in South Wales, The South Wales Wildlife Sites Partnership, 2004) and Section 7 listed species (Environment (Wales) Act 2016 Section 7 Priority Species).

- All areas of the Scheme, including the earthworks footprint, 33 / 11 KV works locations, haul roads and the location of the spoil heaps, to record if the above listed species were present (or likely absent) and to assess potential donor sites.
- Land intended for use to deliver the earthworks construction (i.e. access, storage of soil).
- The locations where the above listed species have been previously recorded, to assess their current status as best as possible, in light of seasonal constraints.
- Locations within the red line boundary or directly adjacent to the Nant Helen Site (up to approximately 1 km west within the conifer plantation), where access was possible, to assess potential receptor sites.

A further objective of the survey was also to record other important species that would be worthy of translocation and that may not have been recorded previously. Full results can be found in Appendix C.2 in the Botanical Survey Report.

2.2.2. Results

Potential Section 7²⁰ and / or Annex 1²¹ habitat were identified during the botanical survey and following a review of previous survey data²². These habitats include:

2.2.2.1. Section 7 Habitats

- Hedgerows.
- Deciduous woodland.
- Upland mixed ashwoods.
- Upland oakwood.
- Lowland dry acid grassland.
- Lowland meadow.
- Upland flushes.
- Fens and swamps.
- Purple moor grass and rush pasture.
- Lowland fen.
- Lowland heathland.
- Upland heathland.
- Reedbed.
- Ponds.
- Blanket bog.

2.2.2.2. Annex I Habitats

- H9180 * Tilio-Acerion forests of slopes, screes and ravines.
- H91A0 old sessile oak woods with Ilex and Blechnum in the British Isles.
- H4030 European dry heaths.
- H3160 natural dystrophic lakes and ponds; and,
- H7130 blanket bogs (non-Section 7 priority-type) Annex 1 habitats.

Areas of potential Section 7 and Annex 1 habitats outside of the Construction Footprint are included in the biodiversity protection zones for the Nant Helen Site (Section 5.2.5 and 5.2.6). The following habitats were identified in the 2019 NVC survey and will be impacted by the Construction Activities: hedgerow, lowland dry acid grassland, purple moor grass and rush pasture and lowland meadow. However, indicative habitat creation and restoration plans created as part of the ES⁹ will mitigate / compensate for this loss of habitats.

²⁰ Environment (Wales) Act 2016 (legislation.gov.uk) accessed 10/02/2023

²¹ Semi-natural, near-natural and natural habitat types listed under Annex I Habitats Directive

²² Sturgess Ecology (On behalf of Ove Arup and Partners) (2020) 'Vegetation surveys. Proposed Global Centre for Rail Excellence'. PBECOLOGY (On behalf of Celtic Energy & GCRE Ltd) (2022) Nant Helen Peatland – Heathland Complex: 2022 Vegetation Survey Humphries, N (2022) Nant Helen Remainder Surface Mine. Review of Habitats and Species of Principal Importance on the Overburden Mound

This EPP includes vascular plant species translocation method statements for the species itemised in the Scheme's planning conditions. These species are included on the vascular plant red list for Wales²³, the Neath Port Talbot Biodiversity Action Plan and / or Neath Port Talbot State of Nature and Nature Recovery Action Plan 2023 (soon to be published). These method statements have been prepared as part of this EPP as detailed below:

2.2.2.3. Common Wintergreen

Common wintergreen has been identified within the Construction Footprint of the Scheme. A method statement for the translocation of common wintergreen from a donor site within the Scheme boundary to a Receptor Site adjacent to the Nant Helen Site, is provided in Appendix D.1.

2.2.2.4. Viviparous Sheep's-fescue, Royal Fern, Lesser Bulrush, and Floating Bur-reed

Viviparous sheep's-fescue, royal fern, lesser bulrush, and floating bur-reed have been identified within the Nant Helen Site but outside of the Construction Footprint and consequently it has been assessed that associated impacts are highly unlikely. A guide to the identification viviparous sheep's-fescue has been created to be included in a pre-construction tool box talk to be delivered by an Ecological Clerk of Works (ECOW). These are provided in Appendix D.2., Appendix D.3., Appendix D.4., and Appendix D.5.

2.2.2.5. Spiked Water Milfoil

Spiked water milfoil has been identified within the Construction Footprint. A method statement for the translocation of spiked water milfoil is provided in Appendix D.6.

2.2.2.6. Greater Tussock Sedge

Greater tussock sedge has been identified within the Construction Footprint. A method statement for the translocation of greater tussock sedge is provided in Appendix D.7.

2.3. Badger

2.3.1. Methodology

A badger survey was carried out by a suitably experienced ecologist in accordance with good practice guidance²⁴ and CIEEM competencies for undertaking badger surveys²⁵. Surveys were undertaken in September and December 2022.

The extent of the badger survey included all land within the Nant Helen Site Boundary where access allowed.

The badger survey included a thorough inspection for evidence of badger activity including setts, latrines, dung pits, prints, snuffle holes (created when foraging), pathways, hairs (e.g. caught on fencing) and scratching posts.

Where setts were recorded, they were classified following the criteria given in Table 2-1 below. The assessment of the likely status of the badger sett(s) was made based on the available evidence and the surveyor's experience.

Table 2-1 - Conventions used in classifying badger setts

Likely status	Typical features
Main	Usually several holes but can equally be a one hole with large spoil heaps and obvious paths emanating from and between sett entrances. Used all-year round.

²³ Dines, T (2008) A Vascular Plant Red Data List for Wales. Plantlife Wales
Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. 2005. The Vascular Plant Red Data List for Great Britain. Species Status7: 1-116. Joint Nature Conservation Committee, Peterborough

²⁴ Harris, S., Cresswell, P. & Jefferies, D. (1989) Surveying Badgers. Occasional Publication No.9. The Mammal Society.

²⁵ CIEEM (2013) Competencies for Species Survey: Badger. The Chartered Institute of Ecology and Environmental Management, Winchester.

Likely status	Typical features
Annex	Normally less than 150 m from main sett, and directly connected by well-worn pathways. May not be in use all the time, even if the main sett is very active.
Subsidiary	Usually at least 50 m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Low quantities of spoil outside of holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

The following criteria were used to understand activity levels of each individual hole and present ideas of changing patterns of sett usage, which helped to determine the overall classification of each sett described above:

- Well used holes: there are obvious signs of current use²⁶ such as fresh spoil, footprints, bedding and/or hairs. No obstructions in the entrance and holes may or may not have been recently excavated.
- Partially used holes: entrances may have debris including fallen leaves, stones or earth and sticks, and even cobwebs across the entrance. Vegetation, including mosses may be growing in the entrance or on old spoil just outside.
- Disused holes: entrances won't have been in use for some time, are partially or completely blocked or collapsed and in some cases, there may only be a depression visible in the ground where the hole used to be. Vegetation including mosses may be covering the remains of the entrance or spoil heap.

Remote Camera Monitoring was undertaken at any setts recorded within 50 m of the Construction Footprint to provide additional information on the usage of each sett by badgers. Full survey results can be found in Appendix C.3 in the Protected Species Report.

2.3.2. Results

The badger surveys identified five badger setts within the Nant Helen Site Boundary.

- Sett 1, subsidiary sett with four partially used entrances.
- Sett 2, outlier sett with one partially used entrance.
- Sett 3, outlier sett with two partially used entrances.
- Sett 4, outlier sett with two partially used entrances.
- Sett 5, outlier sett with one partially used entrance.

All five setts were classified as in-active (Sett 1, 2, 3, 4, and 5). Remote Camera Monitoring was undertaken at Setts 1, 2 and 3, which revealed no evidence of use by badger.

It was assessed that three setts, Setts 2, 3 and 5, will be impacted by the earthworks. Setts 1 and 4 were assessed as highly unlikely to be impacted by the Construction Activities. A badger licence, for the closure of Setts 2, 3 and 5, has been obtained from Natural Resources Wales.

The widespread evidence of badger dung across the Nant Helen Site suggest that badger regularly enter and forage within the area. Surveyors noted that many of the pieces of dung appeared fresh and contained berries which were abundant across the Nant Helen Site Boundary at the time of survey.

Further details related to the impacts of the Construction Activities on badger and measures to protect this species within the Construction Footprint are given in Sections 4.2.2 and 4.2.3 and the protection of badger within retained features is given in Section 5.2.1.

²⁶ Natural England (2009) Protection of Badgers Act 1992 (as amended) Guidance on 'Current Use' in the definition of a Badger Sett.

2.4. Bats

2.4.1. Methodology

All bat surveys detailed below have been undertaken in accordance with good practice guidance²⁷ and CIEEM competencies for undertaking bat surveys²⁸.

2.4.1.1. Preliminary Root Assessment

The preliminary roost assessment of structures and trees was undertaken during the Updated Walkover¹, between 09/06/2022 and 16/06/2022 by competent surveyors. The extent of the assessment was based on the zone of influence for this species group and included all trees and structures within the Nant Helen Site.

The assessment involved a detailed visual examination of structures and trees, which was initially undertaken from ground level, during daylight hours and aided with the use of binoculars and a bright torch. For trees, the preliminary assessment was undertaken from ground level and involved a visual examination to identify potential roost features (PRFs) such as woodpecker holes, rot holes, cracked limbs, dense ivy and flaking bark. Based on the location, aspect, orientation and characteristics of the features identified, each structure / tree was assigned a potential suitability value for bats. The assessment of potential suitability was carried out according to good practice guidance²⁹, which assigns each structure / tree either Negligible, Low, Moderate or High suitability for roosting bats, this is known as the bat roost potential (BRP).

2.4.1.2. Presence/ Likely Absence Surveys

Trees identified as having potential suitability to support roosting bats were subject to aerial tree surveys to determine the presence / likely absence of a bat roost. The surveys were undertaken between 12/09/2022 and 15/09/2022 by suitably licensed surveyors from ECUS. Full survey results can be found in Appendix C.3 in the Protected Species Report.

Following the first round of aerial tree surveys in September 2022, it was recommended that further tree climbing surveys or dusk emergence surveys are carried out on trees identified as having BRP, and to be impacted by the Construction Activities.

In total 14 trees were identified within the Construction Footprint or 30 m impact zone, from these 14 trees, six were assessed to have negligible bat roosting potential following the September 2022 surveys. 2 trees were assessed to have low bat roosting potential and following the one survey in September 2022 require no further activity surveys. The remaining 6 trees were assessed as having moderate or high bat roosting potential and, in line with the guidelines, require further activity surveys between May and August 2023. The surveys can be tree climbing surveys or emergence / return surveys or a combination of methods.

Surveys should be undertaken by competent surveyors and all emergence/ re-entry surveys should be undertaken with the aid of an infra-red camera.

Hibernation surveys of five trees identified as being suitable to support roosting bats were undertaken in January and February 2023. The results of the hibernation survey will be included in a bat report following completion of further bat surveys. These trees will be protected from impacts until the results of the surveys have been analysed.

2.4.2. Results

No buildings will be impacted by the proposed works, so no further building surveys have been completed. 14 trees were identified as having potential to support roosting bats and were located within the Construction Footprint or 30 m buffer. No bat roosts were identified in these trees in surveys in 2022. From the 14 trees, six trees will be impacted by the Construction Activities and still require further emergence / return / climbing surveys in 2023.

A 30 m exclusion zone has been put in place around the two trees with low BRP and the six trees which still require further surveys, this exclusion zone will be maintained until results of the further surveys can inform

²⁷ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

²⁸ CIEEM (2013) Competencies for Species Survey: Bats. Chartered Institute of Ecology and Environmental Management, Winchester.

²⁹ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

further decision making or the need for a European Protected Species licence and associated mitigation, as detailed in Section 5.2.2.

Further details on the impacts of the Construction Activities on bats and measures to protect them are given in Sections 4.2.4 and 4.2.5 and the protection of bats within retained features is given in Section 5.2.2.

2.5. Otters

2.5.1. Methodology

Otter presence / likely absence surveys were carried out between 29/09/2022 and 30/09/2022 by suitably experienced ecologists.

The extent of the survey was based on the zone of influence for this species and included suitable watercourses and waterbodies within the Nant Helen Site Boundary, where access allowed.

The surveys were undertaken following good practice methodologies and were based on guidance set out in the Design Manual for Roads and Bridges (DMRB) Volume 10³⁰, and CIEEM competencies for undertaking otter surveys³¹.

The following evidence of otter activity was searched for and recorded during the surveys:

- Spraints (droppings);
- Feeding remains;
- Paths and slides (defined otter paths on watercourse banks and mud slides evident of where the animal regularly enters the watercourse); and
- Footprints.
- Resting sites

Full survey results can be found in Appendix C.3 in the Protected Species Report.

2.5.2. Results

It was identified that the River Tawe loosely connects to the northern Site Boundary through small tributaries, and the River Dulais has the same level of connectivity to the Site Boundary in the South. Due to these connections, it is possible that otter may use the site as upland habitat, utilising the rush pasture for shelter and making use of the various ponds for foraging. Any use of the site by otter is likely to be very sporadic and limited to the very edges of the Nant Helen Site Boundary where there is better connectivity between the areas of suitable habitat.

Two records of otter were identified on the road adjacent to the Nant Helen Site during the data search, both of these records were road mortalities³². Suitable habitat for otter was identified within the Nant Helen Site Boundary, however the lack of evidence of otter within the Nant Helen Site Boundary suggests their presence is unlikely. Commuting otters may use the Nant Helen Site, but no resting sites were identified.

A precautionary method of works (PMW) for otter, overseen by an ECOW, will inform contractors how they may work in a manner that minimises the potential to disturb or cause harm to otter.

Further details on the impacts of the Construction Activities on otter and measures to protect them are given in Section 4.2.12.

2.6. Water Vole

2.6.1. Methodology

Water vole presence / likely absence surveys were carried out between 29/09/2022 and 30/09/2022. The extent of the survey was based on the zone of influence for this species and included suitable watercourses and water bodies within the Nant Helen Site Boundary.

³⁰ The Design Manual for Roads and Bridges DMRB Volume 10, Section 1 Part 9 HA 81/99 Chapter 7, Grogan

³¹ CIEEM (April, 2013) Competencies for Species Survey: Eurasian Otter.

³² A data search was undertaken from Biodiversity Information Service for Powys and Brecon Beacons National Park on 30/06/2022.

The surveys were undertaken according to good practice guidance^{33,34} and CIEEM competencies for undertaking water vole surveys³⁵.

The following evidence of water vole activity was looked for during these surveys:

- Burrows and 'lawns' (area around burrow entrances where there is grazed vegetation, surrounded by taller vegetation);
- Faeces;
- Latrines;
- Feeding stations;
- Runways and footprints;
- Nests; and
- Sightings.

Full survey results can be found in Appendix C.3 in the Protected Species Report.

2.6.2. Results

It was identified that the River Tawe loosely connects to the northern site extent through small tributaries, and the River Dulais has the same level of connectivity to the Nant Helen Site in the South.

No evidence of water vole was recorded during the surveys in 2022. The water vole habitat within the Nant Helen Site lacks connectivity which limits the Site's ability to sustain a viable population. The Nant Helen Site is regularly poached by sheep, and so is limited to small areas of isolated sub-optimal habitat. There is some potential for terrestrial burrowing in the rush pasture, however again, this is regularly used by grazing sheep and so is likely to be too disturbed and boggy in many places.

With sub-optimal habitat for water vole and the lack of evidence of water vole within the Nant Helen Site, it is unlikely that water vole are present. No records of water vole were identified within 1 km of the Nant Helen Site during the data search³⁶.

Further surveys for water vole are being undertaken in April 2023 and September 2023. Further impact assessment/ species mitigation measures will follow the outcome of these surveys.

A precautionary method of works (PMW) will be undertaken until the survey results have provided further information, this will be overseen by the ECoW to inform contractors how they may work in a manner that minimises the potential to disturb or cause harm to water vole.

Further details on the impacts of the Construction Activities on water vole and measures to protect them are given in Section 4.2.16.

2.7. Amphibians

2.7.1. Methodology

An assessment of terrestrial and aquatic habitats for amphibians was carried out, including an assessment of aquatic habitat for its suitability to support great crested newts using the HSI assessment. All great crested newt surveys detailed below have been undertaken in accordance with good practice guidance³⁷ and CIEEM competencies for undertaking great crested newt surveys³⁸.

³³ Strachan, R. and Moorhouse, T. (2011). *Water Vole Conservation Handbook (3rd edition)*. Wildlife Conservation Research Unit, University of Oxford.

³⁴ Dean, M. et al *The Water Vole Mitigation Handbook (2016)*. Mammal Society.

³⁵ CIEEM (April, 2013) *Competencies for Species Survey: Water Vole*.

³⁶ A data search was undertaken from Biodiversity Information Service for Powys and Brecon Beacons National Park on 30/06/2022.

³⁷ English Nature (2001) *Great Crested Newt Mitigation Guidelines*.

³⁸ CIEEM (2013) *Competencies for Species Survey: Great Crested Newt*. Chartered Institute of Ecology and Environmental Management, Winchester.

2.7.1.1. Habitat Suitability Index Assessment

HSI³⁹ assessments were undertaken on 08/09/2022 and 09/09/2022 in accordance with good practice guidance⁴⁰. The extent of the HSI assessments included all water bodies within the Nant Helen Site Boundary, where access allowed. The survey was undertaken by suitably experienced ecologists with at least one great crested newt survey licensed surveyor present.

As stated in good practice guidance, the HSI for great crested newts is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any particular pond with a high score will support great crested newts, or that any pond with a low score will not do so. There is a positive correlation between HSI scores and the numbers of great crested newts observed. In general, high HSI scores are likely to be associated with greater numbers of great crested newts. The relationship is not sufficiently strong, however, to allow estimations of the numbers of newts in any particular pond.

Full survey results can be found in Appendix C.3 in the Protected Species Report.

2.7.2. Results

The higher elevation of the Nant Helen Site (over 250m above sea level⁴¹)³⁷, and the lack of records of great crested newt within the Nant Helen Site or nearby⁴², indicate that it is unlikely that GCN are present.

11 ponds scored good or excellent during the HSI survey.

As a precaution, eDNA samples will be taken and analysed from waterbodies with a good or excellent HSI score. Further impact assessment / species mitigation measures for GCN will follow the outcome of these eDNA surveys. Further details on the impacts of the Construction Activities on amphibians and measures to protect them are given in Sections 4.2.7. Details on the protection of GCN within retained features is given in Section 5.2.4.

2.8. Reptiles

2.8.1. Methodology

2.8.1.1. Presence / Likely Absence Surveys

Presence / likely absence surveys for widespread species of reptile⁴³ were carried out between 01/09/2022 and 27/09/2022 in accordance with standard survey guidance⁴⁴ and CIEEM competencies for undertaking reptile surveys⁴⁵.

The extent of the reptile survey was based on the zone of influence for this species group and included targeted areas of suitable habitat, identified during the walkover survey, within the Nant Helen Site Boundary. The objective of this survey was to confirm the species composition and abundance across the site, therefore, locations likely to contain reptile populations were targeted for survey.

A total of 445 artificial refuges consisting of roofing felt squares and tins, were laid out within suitable habitat. Other suitable reptile refuges already present on the Nant Helen Site that could be used by reptiles (e.g. litter and logs) were also checked.

Seven checks of the artificial refuges were undertaken in suitable weather conditions (taken to be daytime air temperatures between 9°C and 18°C with little or no wind or precipitation) between 01/09/2022 and 27/09/2022. Surveyors initially checked the upper surface of reptile mats to identify any reptiles basking. The

³⁹ Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*) Herpetological Journal 10 (4), 143-155 (2000). Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. The great crested newt Habitat Suitability Index (HSI) is a quantitative measure of aquatic habitat quality for great crested newt. The HSI is a number between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of newts.

⁴⁰ Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARGUK

⁴¹ Ordnance survey map for site.

⁴² A data search was undertaken from Biodiversity Information Service for Powys and Brecon Beacons National Park on 30/06/2022.

⁴³ Due to the restrictive ranges of smooth snake and sand lizard, these species are not considered within this report.

⁴⁴ Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife advice sheet 10.

⁴⁵ CIEEM (2014) Competencies for Species Survey: Reptiles. The Chartered Institute of Ecology and Environmental Management.

refuges were then lifted to identify any reptiles present underneath. Notes of any reptiles identified, including numbers, species, sex age and notable identification features were recorded.

Full survey results can be found in the Reptile Report in Appendix C.4.

2.8.2. Results

Reptiles were recorded during all the completed surveys in September 2022 and the results show that common lizard are widespread across the Nant Helen Site.

Reptile surveys completed by Arup in 2019 and Atkins in 2023 recorded an 'Exceptional' population⁴⁶ of common lizard, and areas of negligible, poor, moderate and good quality reptile habitat at locations across the Nant Helen Site.

A common lizard trap and relocation method statement has been created and comprises a minimum of 30 days of trapping, completed between March and October, aided by semi-permanent reptile fencing, temporary drift fencing, habitat manipulation in targeted areas, and destructive searches.

Three reptile receptor sites have been agreed as part of the trap and translocate mitigation strategy.

A reptile species report and trapping and relocation method statement has been prepared and is provided in Appendix C.4.

2.9. Hazel Dormouse

2.9.1. Methods

The Updated Walkover identified the broadleaved woodland, scrub and hedgerows within the Nant Helen Site Boundary as being suitable habitat for hazel dormouse. In particular, the areas of species-rich intact hedgerow and broadleaved woodland in the north of the Nant Helen Site are considered suitable, due to the presence of food sources including hazel nuts, fruit and flowers, as well as their connectivity to areas of woodland in the surrounding areas.

During bat tree climbing surveys on 13/09/2022 two nests were found which are considered likely to be those of hazel dormouse. These were recorded at the northeast of the Nant Helen Site. Further surveys of the trees where the nests were found were undertaken by an independent consultant as instructed by GCRE.

No hazel dormice, nests or other field signs were recorded during targeted dormouse surveys undertaken between July and November 2019 by Arup⁴⁷. A total of 160 nest boxes and nest tubes deployed during these surveys were located within the current Nant Helen Site Boundary.

2.9.2. Results

Further surveys of the trees where the nests were found confirmed that the nests were not dormouse. No records of hazel dormouse were identified within 1 km of the Nant Helen Site during the data search⁴⁸. No records of hazel dormouse were recorded within the Nant Helen Site during previous surveys. The walkover survey revealed suitable habitat and connectivity within the Nant Helen Site to support hazel dormouse

Repeat dormouse surveys will be undertaken at the north of the Nant Helen Site Boundary in areas of suitable habitat, owing to the time elapsed since the previous surveys. There will be no works within the area of suitable dormouse habitat until these surveys are complete.

Nest box and footprint tunnels, placed in areas of suitable habitat, will be surveyed for hazel dormouse between April and June 2023. Further impact assessment / mitigation measures for hazel dormouse will follow the completion of these surveys.

Further details on the impacts of the Construction Activities on dormouse and measures to protect them are given in Section 4.2.8.

⁴⁶ Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife advice sheet 10.

⁴⁷ Arup (2020) Dormouse Survey Report. Global Centre of Rail Excellence. Revision A. Welsh Government

⁴⁸ A data search was undertaken from Biodiversity Information Service for Powys and Brecon Beacons National Park on 30/06/2022.

2.10. Summary of Survey Findings

Based on the findings of the Updated Walkover, combined with the existing survey data and specialist update surveys the following further surveys, precautionary methods of working and mitigation measures were made.

The following further surveys are still to be undertaken, with final impact assessments or the details of any mitigation added to this EPP on completion of the surveys.

- Water vole,
- Bats- aerial tree inspections and bat activity surveys,
- Great crested newt (GCN)- environmental DNA (eDNA) surveys, and
- Hazel dormouse- footprint tunnel and nest tube surveys.

The following species will be subject to a precautionary method of working and/ or species method statements:

- Amphibians,
- Badger - setts and foraging and commuting badgers,
- Bat - roosts and lighting impacts for foraging and commuting bat,
- Brown hare,
- Hedgehog,
- Invasive non-native plant species,
- Nesting birds, including crossbill, honey buzzard and goshawk⁴⁹,
- Otter,
- Notable¹⁹ plant species,
- Polecat, and
- Reptiles.

The following species were scoped-out from requiring additional survey and/or precautionary methods of working:

- Priority invertebrates²⁰;
- White clawed crayfish; and
- Fungi.

⁴⁹ Crossbill, honey buzzard and goshawk, which are all schedule 1 protected birds under the Wildlife and Countryside Act 1981 (as amended)

3. Risk Assessment of Potentially Damaging Activities

This section details the Construction Activities, and discusses proposed methodologies and timings for the different aspects. For each Construction Activity the potential ecological receptors are given, with further details for each ecological receptor given in Section 4, Appendix C.4 and Appendix D.

3.1. Creation of Haul Roads

Haul roads across the site will be constructed prior to earthworks commencing. The location of the haul routes is shown in Appendix B. The haul roads have potential to impact a variety of habitats. The ecological risks are given below in Table 3-1. Additional information is needed on timings, methods and machinery that will be used in the construction of the haul roads is not yet available.

Table 3-1 - Haul Road Ecological Risks

Zone	Start Date	End Date	Activities	Ecological Risk within the haul roads footprint (and relevant section of EPP)
All zones contributing	20/02/2023	Unknown	Construction of haul roads	• Amphibian (excluding GCN) (see section 4.2.1) • Badger- foraging and commuting (see section 4.2.2), • Badger- setts (see section 4.2.3), • Bats- foraging and commuting (see section 4.2.4), • Bats- roosts (see section 4.2.5), • Brown hare (see section 4.2.6), • GCN- buffer zone to suitable ponds (see section 4.2.7), • Habitat- lowland meadow (see section 4.2.17), • Hazel dormouse (see section 4.2.8), • Hedgehog (see section 4.2.9), • INNPS (see section 4.2.10), • Nesting birds (see section 4.2.11), • Otter (see section 4.2.12), • Reptiles (see Appendix C.4), • Water vole (see section 4.2.16).

3.2. Earthworks for the Inner and Outer Loops

3.2.1. Earthworks Methodologies

The following methodologies will be used to construct the proposed embankments and cuttings.

3.2.1.1. Embankments

Earthwork embankments will be constructed from the opencast spoil and excavated rock to the final designed profiles. The opencast spoil will be placed in 1000 mm layers using CAT D9 machinery and compacted using a CAT 72 roller with 8no passes⁵⁰.

3.2.1.2. Cutting

Earthwork cuttings will be excavated through both opencast spoil and natural ground. The natural ground encountered will be ‘rock walls’ left in place as part of the historic mine workings and natural ground at the extremities of the site not worked as part of the open cast workings. Sections of the earthwork cuttings will be through areas of natural undisturbed mudstones. Any oversize mudstone will be processed to reduce the size into acceptable limits.

3.2.1.3. Earthworks Drainage

To protect the earthwork cuttings and embankments from the impacts of surface water runoff and reduce the effects of dirty water runoff, the installation of pre-earthworks drainage is required. This includes the installation of either side of the final ditch design which will be installed as a cut off ditches to the top of cutting and cut off ditches at the base of embankments. On completion of the earthworks, this drainage will then become part of the permanent drainage and will be connected to attenuation ponds.

There will be locations where temporary drainage measures will be required to control and prevent dirty water run-off entering local watercourses. These temporary lagoons will be constructed on the line of the proposed permanent drainage system with a series of baffles and straw bales to allow sediments to be separated from the surface waters before they enter the watercourses.

3.2.2. Earthworks Zones

The earthworks area for the scheme is split into zones, which are detailed below Table 3-2. The earthworks will be undertaken in stages within each of the zones with the estimated start and end dates for each activity detailed, and the overall start and end date for each zone is given in bold⁵¹. The species to which the Construction Activities pose a risk are detailed in the Table 3-2. A plan showing each zone is given in D.6.

Zones 1A and 2A are outside of the Nant Helen Site Boundary and form part of the washeries site. These areas are not covered within this EPP.

Zones 4c and 6 are shown in the earthworks zones plan but have been combined with Zone 4a within the construction programme.

⁵⁰ GCRE (2022) Overall Construction Method Statement Draft.

⁵¹ Construction information dated 23rd February 2023. These dates are subject to change.

Table 3-2 – Earthworks Zones, Dates and Ecological Risks

Zone	Activities	Start Date	End Date	Ecological Risk within the earthworks footprint (and relevant section of EPP)
1B	Pre-earthworks draining	16/01/2023	26/01/2023	- Amphibian (excluding GCN) (see section 4.2.1) - Badger- foraging and commuting (see section 4.2.2), - Bats- foraging and commuting (see section 4.2.4), - Brown hare (see section 4.2.6), - GCN- buffer zone to suitable ponds (see section 4.2.7), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Plants- floating bur-reed (See Appendix Error! Reference source not found.), - Reptiles (see Appendix C.4).
	Excavation of material	17/01/2023	21/07/2023	
	Fill of material	14/03/2023	22/03/2023	
2B	Installation of temporary fencing	17/05/2024	10/06/2024	- Badger- foraging and commuting (see section 4.2.2), - Bats- foraging and commuting (see section 4.2.4), - Brown hare (see section 4.2.6), - Habitat- lowland meadow (see section 4.2.17), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Reptiles (see Appendix C.4).
	Stripping of the soil	11/06/2024	26/07/2024	
	Pre-earthworks draining	18/06/2024	28/06/2024	
	Excavation of material	25/06/2024	18/02/2025	
	Fill of material	02/07/2024	01/11/2024	
3A and 3B	Installation of temporary fencing	23/04/2024	13/05/2024	- Amphibian (excluding GCN) (see section 4.2.1) - Badger- foraging and commuting (see section 4.2.2), - Bats- foraging and commuting (see section 4.2.4), - Brown hare (see section 4.2.6), - GCN- buffer zone to suitable ponds (see section 4.2.7), - Habitat- lowland dry acid grassland and purple moor grass and rush pasture (see section 4.2.17), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Otter (see section 4.2.12),
	Stripping of the soil	23/04/2024	29/05/2024	
	Pre-earthworks draining	30/04/2024	08/05/2024	
	Excavation of material	02/05/2024	05/11/2024	
	Fill of material	02/05/2024	23/07/2024	

				- Plants- spiked water milfoil, greater tussock sedge, (see Appendix D.6 Error! Reference source not found. and D.7 respectively), - Reptiles (see Appendix C.4), - Water vole (see section 4.2.16).
4a, 4c and 6 (Embankment)	Clearance of trees	23/05/2023	13/06/2023	- Amphibian (excluding GCN) (see section 4.2.1) - Badger- foraging and commuting (see section 4.2.2), - Bats- foraging and commuting (see section 4.2.4), - Brown hare (see section 4.2.6), - GCN- buffer zone to suitable ponds (see section 4.2.7), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Otter (see section 4.2.12), - Plants- common wintergreen (see Appendix D.1), - Polecat (see section 4.2.14), - Reptiles (see Appendix C.4), - Water vole (see section 4.2.16).
	Installation of temporary fencing	19/05/2023	15/06/2023	
	Stripping of the soil	16/06/2023	06/09/2023	
	Pre-earthworks draining	16/06/2023	29/06/2023	
	Excavation of material	30/06/2023	05/07/2023	
	Fill of material	06/07/2023	14/03/2024	
4b (Embankment)	Installation of temporary fencing	06/06/2024	02/07/2024	- Amphibian (excluding GCN) (see section 4.2.1) - Badger- foraging and commuting (see section 4.2.2), - Badger- setts (see section 4.2.3), - Bats- foraging and commuting (see section 4.2.4), - Bats- roosts (see section 4.2.5), - Brown hare (see section 4.2.6), - GCN- buffer zone to suitable ponds (see section 4.2.7), - Hazel dormouse (see section 4.2.8), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Otter (see section 4.2.12), - Polecat (see section 4.2.14), - Reptiles (see Appendix C.4), - Water vole (see section 4.2.16).
	Stripping of the soil	03/07/2024	20/09/2024	
	Pre-earthworks draining	24/07/2024	06/08/2024	
	Excavation of material	07/08/2024	09/08/2024	
	Fill of material	17/07/2024	22/10/2024	
	Installation of	01/03/2024	10/04/2024	

4a and 4b (Cutting)	temporary fencing			- Amphibian (excluding GCN) (see section 4.2.1) - Badger- foraging and commuting (see section 4.2.2), - Badger- setts (see section 4.2.3), - Bats- foraging and commuting (see section 4.2.4), - Bats- roosts (see section 4.2.5), - Brown hare (see section 4.2.6), - GCN- buffer zone to suitable ponds (see section 4.2.7), - Hazel dormouse (see section 4.2.8), - Hedgehog (see section 4.2.9), - INNPS (see section 4.2.10), - Nesting birds (see section 4.2.11), - Plants- common wintergreen (see Appendix D.1), - Reptiles (see Appendix C.4), - Water vole (see section 4.2.16).
	Stripping of the soil	15/03/2024	07/05/2024	
	Pre-earthworks draining	29/03/2024	08/05/2024	
	Excavation of material	12/04/2024	13/03/2025	
	Fill of material	07/03/2025	13/05/2025	

3.3. Creation of Soil Stockpiles

Throughout the earthworks phases (16/01/2023- 13/03/2025) earth will be moved around the Nant Helen Site and stored in stockpiles which will then be used for infilling of appropriate areas. The stockpiles are proposed to be located at the centre of the Nant Helen Site (See location in Appendix B).

The material will be excavated using 70ton excavators and transported to the deposition areas using 45ton dump trucks. The material will be tipped and levelled using CAT D9 dozers before being compacted using the CAT 72 rollers. All movement of machinery will be along agreed haul routes. Details of the ecological risks associated with the creation of the soil stockpiles are given below in Table 3-3.

Table 3-3 - Soil Stockpile Dates and Ecological Risks

Zone	Start Date	End Date	Activities	Ecological Risk within the soil stockpiles footprint (and relevant section of EPP)
All zones contributing	16/01/2023	13/03/2025	Creation of earth stockpiles	- Badger- setts (see section 4.2.3), - Nesting birds (see section 4.2.11), - Reptiles (see Appendix C.4),

3.4. Diversion of the 33/11 KV Cable

The diversion of the 33/11KV cable is due to be undertaken between 24/07/2023 and 29/09/2023. The works will include the removal of the existing overhead 33/11KV cable which runs north to south through the centre of the Nant Helen Site and the installation of an underground 33/11KV cable around the northern and western boundary of the Nant Helen Site. The Construction Footprint for the diversion works is currently known and therefore only potential ecological constraints have been detailed below in Table 3-4. Additional information on methods and machinery is not yet available.

Table 3-4 - Diversion of the 33/11 KV Cable and Ecological Risks

Zone	Start Date	End Date	Activities	(Potential) Ecological Risk within the 33/11Kv cable diversion footprint (and relevant section of EPP)
All zones contributing	06/02/2023	09/10/2023	Removal of existing 33/11 KV cable	• Amphibian (excluding GCN) (see section 4.2.1) • Badger- foraging and commuting (see section 4.2.2), • Badger- setts (see section 4.2.3), • Bats- foraging and commuting (see section 4.2.4), • Brown hare (see section 4.2.6), • GCN- buffer zone to suitable ponds (see section 4.2.7), • Habitats- lowland dry acid grassland (see section 4.2.17), • Hazel dormouse (see section 4.2.8), • Hedgehog (see section 4.2.9), • INNPS (see section 4.2.10), • Nesting birds (see section 4.2.11), • Otter (see section 4.2.12), • Reptiles (see Appendix C.4), • Water vole (see section 4.2.16).
All zones contributing	06/02/2023	09/10/2023	Installation of underground 33/11KV cable	• Amphibian (excluding GCN) (see section 4.2.1) • Badger- foraging and commuting (see section 4.2.2), • Badger- setts (see section 4.2.3), • Bats- foraging and commuting (see section 4.2.4), • Bats- roosts (see section 4.2.5), • Brown hare (see section 4.2.6), • GCN- buffer zone to suitable ponds (see section 4.2.7), • Habitat- lowland meadow (see section 4.2.17), • Hazel dormouse (see section 4.2.8), • Hedgehog (see section 4.2.9), • INNPS (see section 4.2.10), • Nesting birds (see section 4.2.11), • Otter (see section 4.2.12), • Polecat (see section 4.2.14), • Reptiles (see Appendix C.4), • Water vole (see section 4.2.16).

3.5. Reduction of the Overburden Mound

An overburden mound is present at the southwest of the Nant Helen Site, see Appendix F. This area consists of multiple tiers of grass covered spoil which were created during the previous mining works at the Nant Helen Site. The overburden mound was reduced initially in 2022 and there is potential for the overburden mound to be further reprofiled as part of these works. Further details on the Construction Footprint, methods, machinery and timings are not currently available and are needed in order to complete the risk assessment of potential damaging activities for this element of the works. Section 7 habitats have previously been identified on all areas of undisturbed / vegetated surfaces and will be impacted should the overburden mound be further reduced⁵². The overburden mound also has potential to support amphibians, brown hare, hedgehog, nesting birds and reptiles which may also all be impacted should the overburden mound be reduced. This section will be updated if it is confirmed that the overburden mound reduction will take place.

3.6. Common land

Areas of common land will be protected during the earthworks construction. Following construction, common land will be reverted back to grazing, the impacts of which are not covered in this document.

⁵² Humphries, N (2022) Nant Helen Remainer Surface Mine. Review of Habitats and Species of Principal Importance on the Overburden Mound

4. Measures to Manage Ecological Risk of Construction Activities

4.1. General Ecology Watching Brief

Ecological risks have been identified for the following habitats / species as shown in the ecological constraints plan in Appendix F. An ecological watching brief will be in place during periods of the construction. This role will be undertaken by the Project Ecologist and / or Ecological Clerk of Works.

An ecological watching brief will be in place during Construction Activities required for the following receptors:

- Amphibians (excluding GCN) - until all suitable habitat has been removed.
- Badger- setts and any exclusion zones- in accordance with the badger licence.
- Badger- foraging and commuting habitat - until all suitable habitat has been removed.
- Bats- foraging and commuting habitat - until all suitable habitat has been removed.
- Brown hare- until all suitable habitat has been removed.
- Hedgehog - until all suitable habitat has been removed.
- Invasive non-native plant species during all site work, surveillance for invasive non-native plant species which may require specialist contractor input- until all suitable habitat has been removed.
- Nesting birds- For any vegetation clearance during the nesting bird season- March to September.
- Otter- pre works check of suitable habitat - until all suitable habitat has been removed.
- Plant- Common wintergreen translocation- during translocation.
- Plant- Spiked water milfoil translocation- during translocation.
- Plant- Floating bur-reed translocation- during translocation.
- Plant- Greater tussock sedge- during translocation.
- Polecat in all areas of suitable habitat (Zone 4a and 4b)- until all suitable habitat has been removed. And
- Reptile trapping and mitigation- to be detailed in the reptile mitigation strategy (Appendix C.4).

Further information on the ecological watching brief requirements for the following species will be given on completion of the additional surveys. Until the further surveys are complete, all suitable habitat for the species listed below will be protected.

- Bats- roosts
- Hazel dormouse
- GCN
- Water voles

4.2. Practical Measures to Avoid or Reduce Impacts to Ecological Features within the Scheme

Method statements for the protection of reptiles and important plant species are presented separately in Appendix C.4 and Appendix D respectively. Details of measures to avoid or reduce impacts on the remaining species are stated below.

4.2.1. Amphibian (excluding GCN)

A precautionary method of working (PMW) and ecological watching brief for amphibians will be provided to contractors, related to the protection of amphibian species, in particular frogs and common toad, which are widespread across the Nant Helen Site, and palmate newt, which were identified during the reptile surveys near the bog at the centre of the Nant Helen Site, so that care may be taken to avoid unnecessary harm occurring to them. These will be detailed in a PMW for amphibians.

4.2.2. Badger- Foraging and Commuting

Evidence of badger was found across the Nant Helen Site. Any excavations (pits or trenches) created as part of the Scheme have potential to cause harm to badger, through possible entrapment. All excavations will be filled or covered each night. If this is not possible then one end of the excavation will be graded to provide a ramp for badger to escape and prevent them from becoming trapped.

Where night-time working is required, lighting will be kept to a minimum and directed away from habitats that may be used by badgers.

These will be detailed in a PMW for badger.

4.2.3. Badger- Setts

Three badger setts are within the Construction Footprint and will be directly impacted by the earthworks. In order to protect any badger that may be present, a badger licence has been obtained from Natural Resources Wales. This licence outlines which badger setts will be removed. All works will comply with the details outlined in the badger licence.

An ecological watching will be carried out for any setts which may have been created in the interim since badger surveys were undertaken. Any mitigation required will be assessed / developed on a case by case basis, as advised by the Project Ecologist and / or Ecological Clerk of Works.

All areas of spoil will be tightly tracked as they are created. Spoil stockpiles will be carefully checked by an Ecologist for the presence of badger, prior to any spoil being removed or added.

These measures will be detailed in a PMW for badger.

4.2.4. Bats - Foraging and Commuting

The trees, woodland, scrub, grasslands and ponds within the Nant Helen Site are suitable for foraging and commuting bats. Night works should be avoided where possible. If night works cannot be avoided, then lighting will be kept to a minimum and directed away from known or potential roost features and habitats that may be utilised by bats. In accordance with guidance⁵³ lighting associated with the works should be the minimum required for the task.

This will be detailed in a PMW for bats.

4.2.5. Bats - Trees with Bat Roosting Potential

Trees identified as having bat roosting potential, and within the identified zone of influence, were subject to hibernation checks in January and February 2023. Following this, emergence surveys and / or aerial tree assessments will be undertaken of trees, which will be impacted by the Construction Activities, during the bat active period (May to August). Should trees be found to contain bat roosts then further surveys or licences may be required. Further impact assessment or species mitigation measures will be given following completion of these surveys, details will be updated within this EPP. All trees with bat roosting potential will be protected by a 30 m buffer zone until the surveys have been completed and the further impact assessment / mitigation measures for roosting bats given. Should more trees need removal that have not been assessed then further surveys may be needed.

4.2.6. Brown Hare

The habitats at the Nant Helen Site are suitable to support brown hare. A pre works check of suitable habitat will be undertaken. Should brown hare be identified then they will be moved / guided to a safe location outside of the Construction Footprint. All excavations will be filled or covered each night. If this is not possible then one end of the excavation will be graded to provide a ramp for brown hare to escape and prevent them from becoming trapped. This will be detailed in a PMW for brown hare.

⁵³ Bat Conservation Trust (BCT) and Institution of Lighting Professionals Guidance (2018) Note 08/18 Bats and artificial lighting in the UK. Bats and the Built Environment Series

4.2.7. GCN - Ponds with GCN Potential

All ponds assessed as having good or excellent HSI scores will be subject to GCN environmental DNA (eDNA) surveys in April 2023⁵⁴. No works will be undertaken within 250 m of these ponds before the results of the eDNA surveys have confirmed GCN absence⁵⁵. Should the eDNA surveys confirm GCN presence then further surveys and a GCN licence will be needed prior to works beginning within 250m of the pond. Further impact assessment / species mitigation measures will follow completion of these surveys, through updates to this EPP.

4.2.8. Hazel Dormouse

The scrub and woodland habitat at the northeast of the Nant Helen Site is suitable to support hazel dormouse. Hazel dormouse population update surveys using nest tubes and footprint tunnels will be undertaken in April-June 2023. Should hazel dormouse be found to be present then further surveys or licences may be required. Further impact assessment / species mitigation measures will follow completion of these surveys, through updates to this EPP. All hazel dormouse habitat will be protected from impacts until the further surveys have been completed, if impacts on the habitat are required, these will be kept to a minimum and undertaken under a PMW for dormouse.

4.2.9. Hedgehog

The habitats at the Nant Helen Site are suitable to support hedgehog. A pre works check of suitable habitat will be undertaken, including checks of suitable sheltering habitat. Should hedgehog be identified then they will be moved / guided to a safe location outside of the Construction Footprint. All excavations will be filled or covered each night. If this is not possible then one end of the excavation will be graded to provide a ramp for hedgehog to escape and prevent them from becoming trapped. This will be detailed in a PMW for hedgehog.

4.2.10. INNPS

A watching brief for INNPS will be undertaken. Should any INNPS be identified the areas will be clearly marked. Specialist contractor advice will be sought for any Construction Activities and the need for exclusion zone. This will be detailed in a marked up plan following surveys.

4.2.11. Nesting Birds

The habitat at the Nant Helen Site is suitable to support nesting birds, including within trees, hedgerow, scrub and on the ground within all grassland habitats. It has also been assessed that the stockpile creation could potentially create suitable habitat for ground nesting birds.

Any vegetation clearance or Construction Activities within suitable nesting bird habitat, will avoid the nesting bird season (1st March to 31st August). If Construction Activities cannot avoid the nesting bird season, then a pre works check for nests will be undertaken. Crossbill were recorded breeding outside of the Nant Helen Site Boundary in 2019⁵⁶, and the Nant Helen Site is in the range of honey buzzard and goshawk, and suitable habitat is present. Crossbill honey buzzard and goshawk are all schedule 1 protected birds under the Wildlife and Countryside Act 1981 (as amended). The site is not considered to support habitats of significant value to these species; however, as a precaution details of these species will be given in the nesting bird PMW.

4.2.12. Otter

There is suitable habitat within the Nant Helen Site for otter. Noise and vibration from the Construction Activities could result in the disturbance of any otter. A pre works check for otter will be undertaken on all watercourses and ponds within 30 m of the Construction Activities, to ensure no evidence of otter has become present in the intervening time between surveys and the start of the Construction Activities. All excavations will be filled or covered each night. If this is not possible then one end of the excavation will be graded to provide a ramp for otter to escape and prevent them from becoming trapped. Night works should be avoided where possible. If night works cannot be avoided, then lighting will be kept to a minimum and directed away from suitable otter

⁵⁴ GCN eDNA surveys to confirm absence of GCN should be undertaken between 15th April and 30th June in line with the guidance: Biggs, et al (2014) Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt eDNA in Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Appendix 5. Freshwater Habitats Trust, Oxford

⁵⁵ 250 m is the recognised area from a breeding pond that GCN are likely to use more frequently. English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature

⁵⁶ Arup (2020) Breeding bird survey report. Global Centre of Rail Excellence Revision A. Welsh Government

habitat. Pollution prevention measures will be adhered to as appropriate. This will be detailed in a PMW for otter.

4.2.13. Plants

For plants that have been identified to be directly impacted by the Construction Activities (common wintergreen, spiked water milfoil and greater tussock sedge), a translocation method statement has been produced. For plants that are outside of the Construction Footprint but within the Nant Helen Site (viviparous sheep's-fescue, royal fern, lesser bulrush and floating bur-reed) surveillance for these plants will be undertaken, more information is given for each species in Appendix D.

4.2.14. Polecat

Suitable habitat for polecat was recorded within the Nant Helen Site. Previous arboreal mammal surveys did not find any evidence of polecat; however, as a precaution, a watching brief for these species will be undertaken prior to Construction Activities commencing in potentially suitable habitat. These will be detailed in a PMW for polecat.

4.2.15. Reptiles

Details of the practical measures to avoid impacts on reptiles are detailed in the reptile species report and mitigation specification in Appendix C.4 and summarised here. A common lizard trapping and relocation programme is proposed prior to commencement of Construction Activities in areas suitable for common species of reptile, and will continue as necessary, in-line with programme phasing. This would comprise trapping in targeted areas, completed between March and October, aided by semi-permanent reptile fencing, temporary drift fencing, habitat manipulation, and destructive search. The ultimate duration of trapping effort at each phase will be determined by the rate at which reptiles are recorded throughout the mitigation exercise, but this would include a minimum of 30 days' trapping in each trapping compartment, and will continue until there are 5 days with no reptile captures or observations, under suitable conditions.

Areas of habitat with low suitability for reptiles, where trapping is not considered necessary, would be subject to habitat manipulation and hand search. Reptiles will be relocated to the agreed receptor sites.

4.2.16. Water Vole

There is sub optimal habitat within the Nant Helen Site for water vole. Noise and vibration from the Construction Activities could result in the disturbance of any water vole. All excavations will be filled or covered each night. If this is not possible then one end of the excavation will be graded to provide a ramp for water vole to escape and prevent them from becoming trapped. Night works should be avoided where possible. If night works cannot be avoided, then lighting will be kept to a minimum and directed away from suitable otter habitat. Pollution prevention measures will be adhered to as appropriate. Further surveys for water vole are being undertaken in April and September 2023. A PMW for water vole will be in place until these surveys have been completed and any impact assessment / species mitigation measures have been given.

4.2.17. Habitats

Site surveys have identified areas priority habitat²⁰ including lowland dry acid grassland, purple moor grass and rush pasture, lowland meadow, broadleaved woodland and hedgerows within the Construction Footprint. Areas of these priority habitats within the Construction Footprint will be lost during the earthworks, installation of the haul roads and removal of the overhead 33/11 KV cable. Further details of these habitats can be found in the botanical report².

5. Measures to protect retained features

5.1. Identification of Biodiversity Protection Zones

Biodiversity protection zones are needed for the following habitats / species and shown in a plan in Appendix G.

Biodiversity protection zones will be implemented during Construction:

- Retained badger setts and their exclusion zones, in accordance with the badger licence.
- Bats - foraging and commuting.
- Plants - areas of common wintergreen, viviparous sheep's-fescue, lesser bulrush, floating bur-reed, royal fern and greater tussock-sedge which have been identified outside of the Construction Footprint. Receptor sites of translocated common wintergreen, spiked water milfoil and floating bur reed following translocation from within the Construction Footprint.
- Habitats- section 7 priority habitat including lowland dry acid grassland, lowland meadow, lowland heathland, purple moor grass and rush pasture, upland flushes and swamp, upland oakwood, broadleaved woodland and hedgerow.
- Reptile habitat and receptor areas- full details to be provided in the reptile translocation method statement⁵⁷.

Biodiversity protection zones will be implemented until further survey information has been received and impact assessment / mitigation measures have been given:

- Bats - trees with bat potential and a 30m exclusion zone.
- GCN - Ponds with GCN potential and a 250m buffer.
- Hazel dormouse - habitat with dormouse potential.
- Water vole - within suitable habitat.

5.2. Practical Measures to Avoid or Reduce Impacts to Retained Features

Method statements for the protection of reptiles and important plant species are given separately in Appendix C.4 and Appendix D respectively. Details of the protection for the remaining habitats and species are stated below:

5.2.1. Badger Setts

A badger licence has been obtained from Natural Resources Wales, this outlines how retained setts (Setts 1 and 4) will be protected from the impacts of the Construction Activities. All Construction Activities will comply with the details outlined in the badger licence.

5.2.2. Bat- Trees with Bat Roosting Potential

Trees identified as having bat roosting potential and within the potential impact of Construction Activities will be subject to protection until the full suite of bat surveys have been undertaken and further impact assessment / species mitigation measures will be given. These trees will be protected by a 30 m exclusion zone around each tree, to prevent damage and to minimise the effects of noise, vibration or lighting impacts.

Trees with bat roosting potential that are being retained will be shielded from noise and lighting impacts from all aspects of the Construction Activities, including earthworks, removal and relocation of the 33/11KV line and the associated haul routes. Shielding will be created using sheeted Heras fencing.

5.2.3. Bat- Foraging and Commuting

The trees, woodland, scrub, grasslands and ponds within the Nant Helen Site are suitable for foraging and commuting bats. Night works should be avoided where possible. If night works cannot be avoided, then lighting

⁵⁷ Atkins (2023). Global Centre of Rail Excellence Complimentary Earthworks Scheme: Reptile Species Report and Trapping and Relocation Method Statement. GCRE Ltd.

will be kept to a minimum and directed away from suitable terrestrial habitats that may be utilised by bats. In accordance with guidance⁵⁸ lighting associated with the Construction Activities should be the minimum required for the task.

This will be detailed in a PMW for bats.

5.2.4. GCN- Ponds with GCN Potential

All ponds highlighted as having good or excellent HSI scores will be subject to GCN environmental DNA (eDNA) surveys in April 2023⁵⁹. No Construction Activities will be undertaken within 250 m of these ponds before the results of the eDNA surveys have confirmed GCN absence⁶⁰. The 250 m exclusion around each pond will be clearly marked with fencing and signs until further impact assessment/ species mitigation measures are made.

5.2.5. Hazel Dormouse

Habitat identified as being suitable to support hazel dormouse will be protected from impacts of Construction Activities until further dormouse surveys have been completed. Protection measures will include fencing and appropriate signage and will be maintained until dormouse are confirmed to be absent or suitable dormouse habitat has been removed.

5.2.6. Reptiles

Details of the practical measures to avoid impacts on retained features that are suitable for reptiles are detailed in the reptile species report and mitigation specification in Appendix C.4. Reptiles will be relocated from within the Construction Footprint to agreed receptor areas within the Site which will not be impacted by the Scheme. Reptile fencing will be in place between the receptor areas and Construction Footprint where necessary and also between areas of suitable habitat and the Construction Footprint, to protect reptiles from re-entering the Construction Footprint. The fencing will be regularly checked and maintained to prevent reptile movement into the Construction Footprint.

5.2.7. Plants

Individual method statements highlighting the protection of retained areas of common wintergreen, viviparous sheep's-fescue, royal fern, lesser bulrush, floating bur-reed, spiked water milfoil and greater tussock sedge are presented in Appendix D.

5.2.8. Habitats

A review of previous survey data²², indicated that lowland dry acid grassland, lowland meadow, lowland heathland, purple moor grass and rush pasture, upland flushes and swamp, upland oakwood, broadleaved woodland and hedgerow priority habitats are present outside of Construction Footprint. Annex 1 woodland habitats are also present, with an area of confirmed ancient woodland present on the northern boundary of the site in Zone 4b, this ancient woodland is located outside of the construction footprint.

Areas identified as priority habitats under Section 7 of the Environment Act 2016 (Wales) and Annex 1 habitats located outside of the Construction Footprint will be protected from impacts of the Construction Activities. The Construction Footprint will be protected through fencing, where appropriate, and signage. Site inductions will brief workers on the location and presence of these habitats and the ecological watching brief will monitor these areas to ensure there are no impacts. All areas of priority and Annex 1 habitat outside of the Construction Footprint will be retained.

5.3. Use of Protective Fences, Exclusion Barriers and Warning Signs.

All areas identified as biodiversity protection zones will be fenced with suitable fencing e.g. Heras fencing, and signs erect on the fencing stating the areas are Biodiversity Protection Zones with restricted access. Fencing

⁵⁸ Bat Conservation Trust (BCT) and Institution of Lighting Professionals Guidance (2018) Note 08/18 Bats and artificial lighting in the UK. Bats and the Built Environment Series

⁵⁹ GCN eDNA surveys to confirm absence of GCN should be undertaken between 15th April and 30th June in line with the guidance: Biggs, et al (2014) Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt eDNA in Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Appendix 5. Freshwater Habitats Trust, Oxford

⁶⁰ 250 m is the recognised area from a breeding pond that GCN are likely to use more frequently. English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature

will also be placed between the Construction Footprint and areas of common land. Details of the biodiversity protection zones will be shown on plans in the Nant Helen Site Offices and highlighted during the Nant Helen Site inductions and tool-box talks. All fencing will be checked by the Ecologist / ECOW as detailed in Section 6.

6. Responsible Persons

Responsibilities of the personnel on site are outlined below in Table 6-1.

Table 6-1 - Roles and Responsibilities

Owner	Responsibilities
GCRE Project Director	Accountable for legal and contractual compliance. Responsible for the provision of adequate resources to maintain legal compliance.
GCRE Environmental Manager	Responsible for programming and managing activities, e.g. obtaining and maintaining environmental consents and licences. Advising Construction Manager, Site Engineers, Site Supervisors and Site Operatives on requirements of undertaking specialist environmental works and remedial action where necessary. Reports back to the Project Director.
Principal Contractor (Walters)	Responsible for ensuring that the Construction Activities are carried out in accordance with the measures set out in this document and its associated appendices. Managing the environmental aspects of the Construction Activities within the Nant Helen Site, including any invasive non-native plant species Ensuring that a copy of this document is available on Site and relevant information is included in the Site Induction. Work with the Project Ecologist to maintain the document and ensure its implementation.
Atkins Project Ecologist	Provide support to and reports back to the Environmental Manager. Provide toolbox talks, organise specialist ecological surveys. Monitor Principal Contractor site ecological compliance, watching brief of works and Construction Activities on site, auditing/reviewing works and procedures including method statements as required. Record and report the progress of ecological works. Report any product or service ecological non-conformances. Provides briefings for and oversees the Ecological Clerk of Works.
Ecological Clerk of Works	Provide a watching brief for all activities that could impact on ecology as detailed in Section 4 either directly or through instruction of other suitably qualified and experienced ecologists. Including: • Amphibians; • Badgers; • Bats; • Brown hare; • GCN; • Hazel dormouse; • Hedgehog; • INNPS; • Nesting birds; • Otter; • Plants; • Polecat;

- Reptiles, and;
- Water vole.

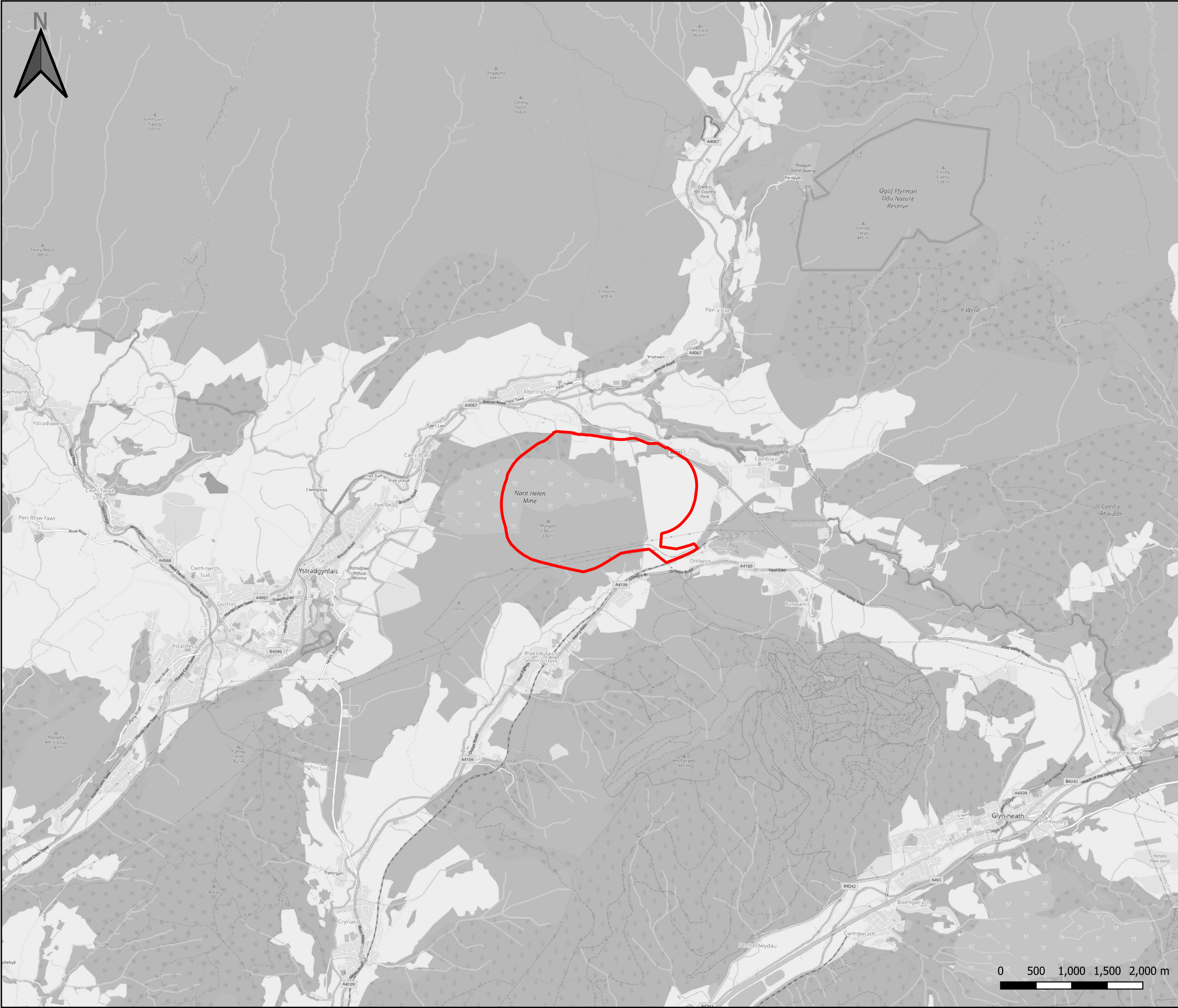
Undertake regular inspections of any exclusion fencing and barriers to ensure compliance with the EPP.

Report back to the Project Ecologist.

Appendices



Appendix A. Nant Helen Site Boundary



**SNC • LAVALIN**

**ATKINS**
Member of the SNC-Lavalin Group

 Nant Helen Site Boundary

Base Mapping: © OpenStreetMaps and its contributors

Atkins, Member of the SNC-Lavalin Group
2 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

**ATKINS**
Member of the SNC-Lavalin Group

Client
GCRE Limited

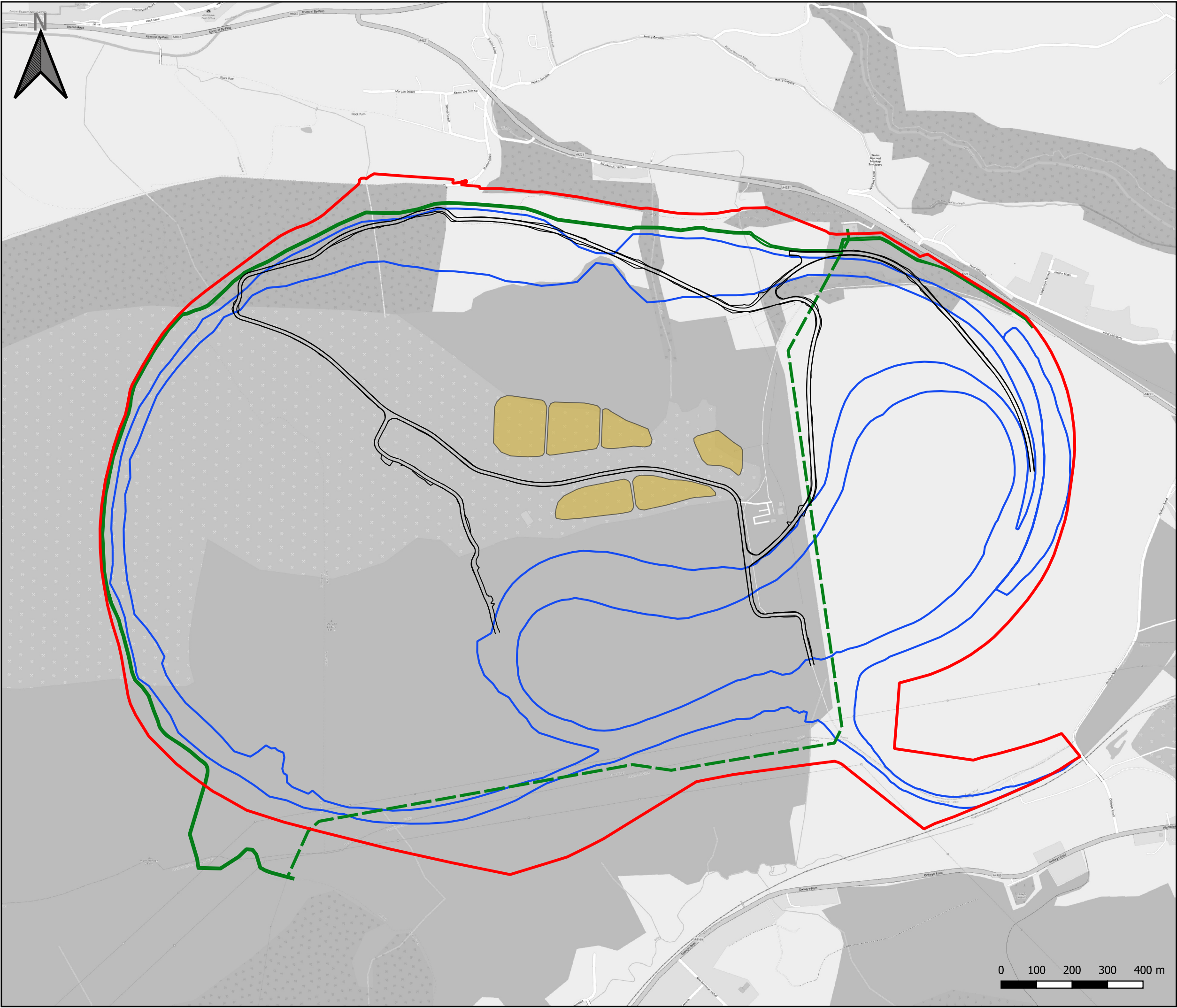
Project
Global Centre of Rail Excellence

Title
Nant Helen Site Boundary

Sheet Size A3	Original Scale: 1:50,000	Design/Drawn SB	Checked VG	Reviewed CW
		Date 02/02/23	Date 19/02/23	Date 22/02/23

Drawing Number				Rev
N/A				00

Appendix B. Scheme Plan



-  Nant Helen Site Boundary
- Scheme Construction Activities
-  Earthworks
-  Dismantle 33/11KV overhead cable
-  Re-route 33/11KV cable underground
-  Haul routes
-  Soil stockpiles

Base Mapping: © OpenStreetMaps and its contributors				
Atkins, Member of the SNC-Lavalin Group 2 Capital Quarter Tyndall Street Cardiff CF10 4BZ		 Member of the SNC-Lavalin Group		
Client		GCRE Limited		
Project		Global Centre of Rail Excellence		
Title		Scheme Plan		
Sheet Size A3	Original Scale: 1:10,000	Design/Drawn SB	Checked VG	Reviewed CW
		Date 13/02/23	Date 19/02/23	Date 22/02/23
Drawing Number N/A				Rev 00

Appendix C. Survey Reports

- C.1. Ecological Update Walkover Survey Report
- C.2. Botanical Report
- C.3. Protected Species Report
- C.4. Reptile Species Report and Mitigation Specification

Appendix D. Plant Translocation Method Statements

D.1. Common Wintergreen

D.2. Viviparous Sheep's-fescue

Viviparous sheep's-fescue (*Festuca vivipara*)

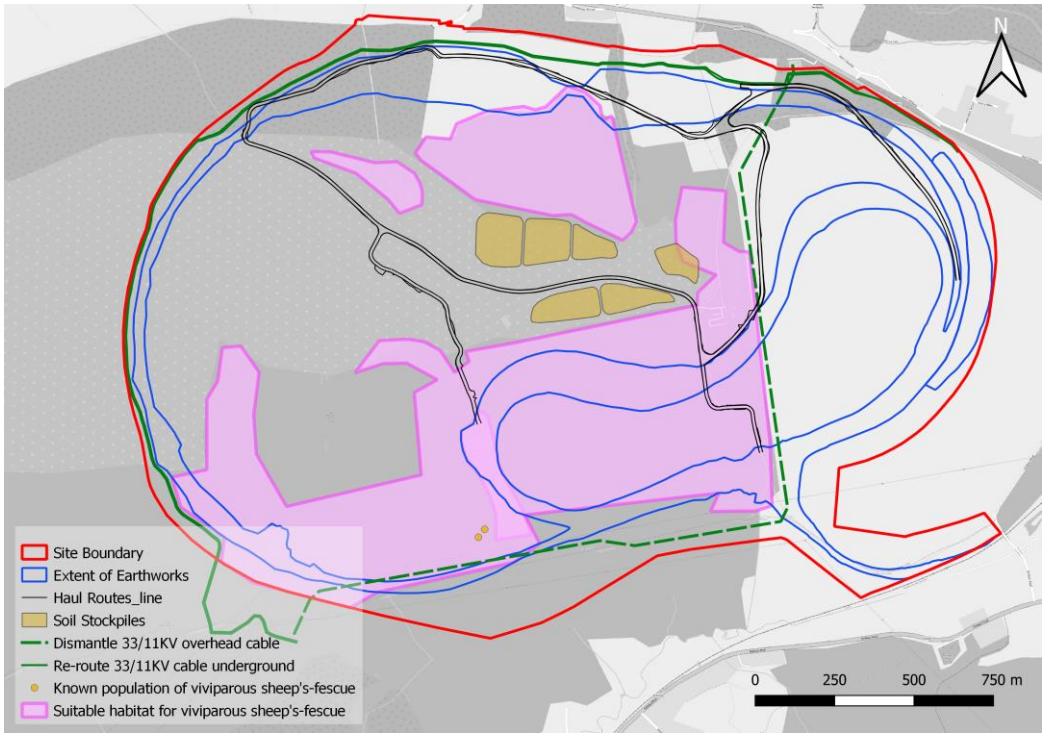
Background and Data Search

The known population of viviparous sheep's-fescue, consisting of several plants, was identified in one location on Site during the NVC survey in 2020¹. The individuals were located at the south west of the Site in an area of sparsely vegetated coal spoil, central NGR of SN825106. The location of the viviparous sheep's-fescue and locations of potentially suitable habitat, based on the 2022 botanical surveys², are shown in Figure 1.

Viviparous sheep's fescue is listed in the South Wales Wildlife Sites Guidelines as a Contributory Species³.

BIS⁴ and BSBI⁵ both returned one record of viviparous sheep's-fescue that was detailed as being from within Nant Helen, recorded in 2020. Therefore, it has been assumed that this record is the individuals of viviparous sheep's-fescue identified during the NVC surveys in 2020.

Figure 1. Plan showing site boundary, proposed extent of the Scheme construction activities, location of viviparous sheep's-fescue and suitable habitat for the species.



Ecology

- Tufted perennial grass often found in upland heathy pastures, on rock ledges and crevices, on mountain slopes and in birch and oak woodlands.
- Viviparous sheep's-fescue is very similar in appearance to other fescues and can only be distinguished when in flower (May- July), thus making identification difficult.
- As a viviparous plant, the viviparous sheep's-fescue reproduces from buds which form plantlets while they are still attached to the plant .
- The viviparous sheep's-fescue found within the Site is outside of the species normal range, therefore, based on the information available, vegetated coal spoil heaps and acid grassland are considered suitable habitats to support the species at this Site.

Photographs



Photo 1. Habitat where viviparous sheep's fescue was found on Site.



Photo 2. Example of viviparous sheep's fescue found within the Site¹.

Proposed Actions

Viviparous sheep's-fescue may be present in areas of suitable habitat within the earth works boundary. Surveys for viviparous sheep's-fescue will be undertaken in areas of suitable habitat in late May/ June, by a Botanist, as a precaution. Should any viviparous sheep's-fescue plants be identified within the earth works boundary then a method statement will be produced detailing the mitigation required, this will likely involve hand digging and relocation of plants close to the known location of viviparous sheep's-fescue.

References

1. Sturgess Ecology (On behalf of Ove Arup and Partners) (2020) Vegetation surveys. Proposed Global Centre for Rail Excellence.
2. Atkins (2023) 2022 Botanical Survey Report. Global Centre of Rail Excellence.
3. Guidelines for the Selection Of Wildlife Sites in South Wales, The South Wales Wildlife Sites Partnership, 2004
4. Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS) Biodiversity Information Service for Powys and Brecon Beacons National Park. Available at <https://www.bis.org.uk/>. Data search undertaken on 30/06/2022
5. Botanical Society of Britain & Ireland (BSBI) data search undertaken on 13/10/2022

D.3. Royal Fern

Royal Fern (*Osmunda regalis*)

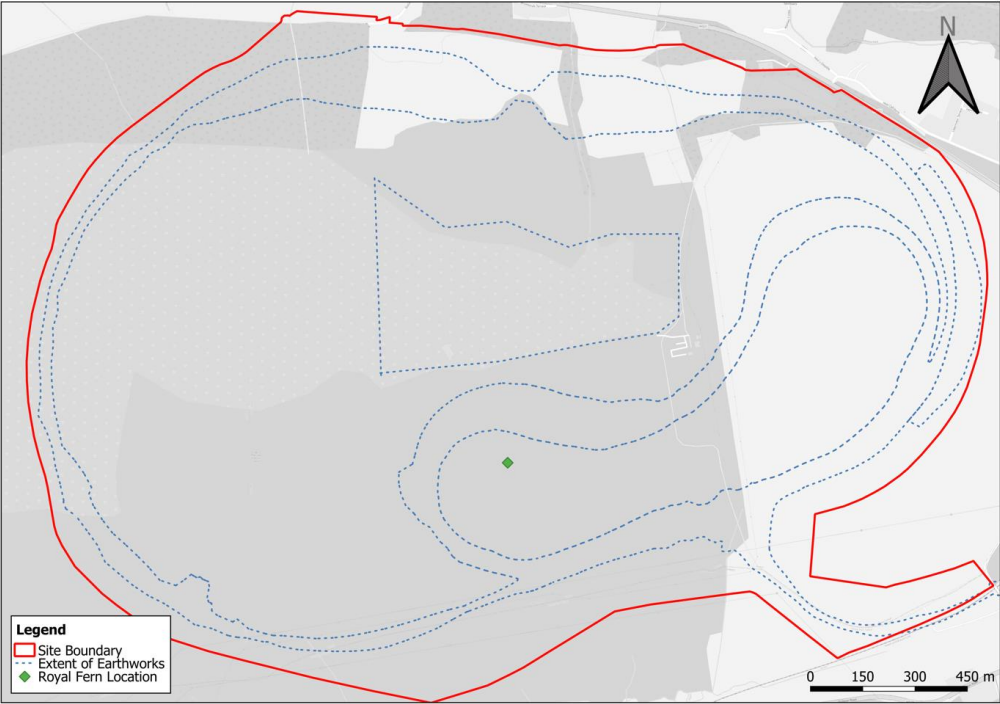
Background and Data Search

A single young frond of royal fern was identified within the Site during the 2020 vegetation surveys¹ (see photo 1). No royal fern were noted during the surveys in 2022². The location of the identified royal fern was outside of the earth works footprint and therefore will not be impacted by the Scheme. Royal fern is listed in the South Wales Wildlife Sites Guidelines as a Contributory Species³.

BIS⁴ provided two records of royal fern since 2012. One of these records was within Nant Helen and was from the 2020 NVC survey. The other records was outside of the Site boundary.

BSBI⁵ provided 12 records of royal fern. One of these records was within Nant Helen and was from the 2020 NVC survey. The other 11 records were outside of the Site boundary, and were recorded between 1970 and 2015.

Figure 1. Plan showing site boundary, proposed extent of earth works and location of royal fern.



Ecology

- A large fern found on neutral or acidic substrates.
- Found in fen-carr woodland, ditches, on riverbanks and rocky lake shores. More rarely in wet fields, mires and on limestone sea-cliffs. Often confined to inaccessible sites in grazed areas.
- The species has declined due to harvesting for cultivation and habitat loss.
- Bipinnate fronds to 2.5m in height, bearing rusty-brown spore-bearing pinnae at the tips; foliage turns attractive red-brown in autumn (see photo 2).
- Grows in cool, moist soils with light shading. Can tolerate wet conditions.

Photographs



Photo 1. Young frond of royal fern identified within the Site¹.



Photo 2. Example of mature royal fern plant with spore bearing pinnae⁶.



Photo 3. Royal fern⁶.



Photo 4. Royal fern⁶.

Proposed Actions

Surveillance for royal fern will be undertaken throughout the Nant Helen Site. Surveillance will be undertaken through a pre works check of areas of suitable habitat and site staff being vigilant for the species. Should royal fern plant be identified then works in that area will cease and advice will be sought from the Project Ecologist. Recommended measures may include digging up the individual and replanting close to the known location of royal fern show in Figure 1.

References

1. Sturgess Ecology (On behalf of Ove Arup and Partners) (2020) Vegetation surveys. Proposed Global Centre for Rail Excellence.
2. Atkins (2023) 2022 Botanical Survey Report. Global Centre of Rail Excellence.
3. Guidelines for the Selection Of Wildlife Sites in South Wales, The South Wales Wildlife Sites Partnership, 2004
4. Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS) Biodiversity Information Service for Powys and Brecon Beacons National Park. Available at <https://www.bis.org.uk/>. Data search undertaken on 30/06/2022
5. Botanical Society of Britain & Ireland (BSBI) data search undertaken on 13/10/2022
6. Photos *Osmunda regalis* | Online Atlas of the British and Irish Flora (brc.ac.uk)

D.4. Lesser Bulrush

Lesser Bulrush (*Typha angustifolia*)

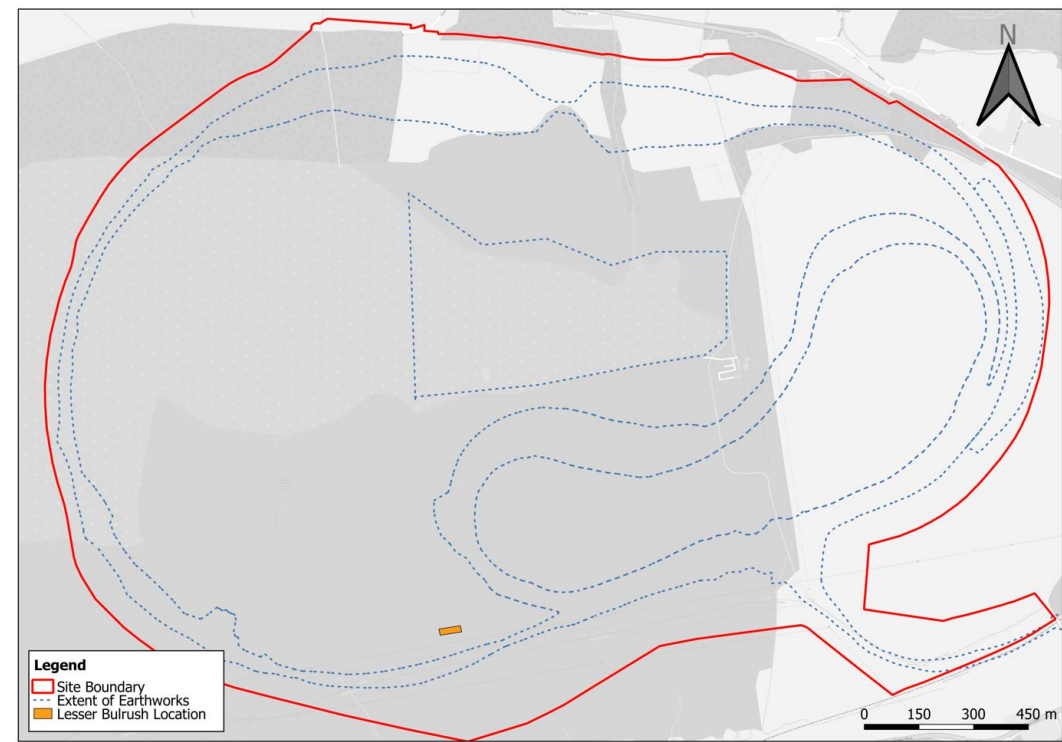
Background and Data Search

Lesser bulrush was recorded within Pond 19, a balancing pond in the south-west of the Site. The species was recorded along the majority of the margin of the pond.

The location of the identified lesser bulrush was outside of the earth works footprint and therefore will not be impacted by the Scheme. Lesser Bulrush is a Welsh Red List¹ EN species and also noted in the South Wales Wildlife Sites Guidelines² - Primary Species list.

BIS³ and BSBI⁴ both provided one record of lesser bulrush within the record search. This record was for the plants identified within the Site during the 2020 NVC survey.

Figure 1. Plan showing site boundary, proposed extent of earth works and location of lesser bulrush.



Ecology

- Tall, rhizomatous perennial grows in both mesotrophic or eutrophic water.
- Found in lowland lakes, ponds, ditches and flooded mineral workings.
- Grows as an emergent plant to 2 or 3 metres tall.
- Similar to common bulrush (*T. latifolia*), but lesser bulrush has very narrow leaves and the stems are topped by smooth cigar-shaped light brown spikes. The male and female part are usually separated by a gap on the stem (Photo 4). It also tends to grow in deeper water than common bulrush.

Photographs



Photo 1. Lesser bulrush identified within the Site⁵.



Photo 2. Lesser bulrush⁶.



Photo 3. Lesser bulrush⁶.



Photo 4. Lesser bulrush⁶.

Proposed Actions

Surveillance for lesser bulrush will be undertaken throughout the Nant Helen Site. Surveillance will be undertaken through pre works check of areas of suitable habitat and site staff being vigilant for the species. Should lesser bulrush be identified within the earth works footprint then works in that area will cease and advice will be sought from the Project Ecologist. Recommended measures may include draining down of the waterbody and translocation of any lesser bulrush plants to a suitable retained pond using an excavator.

References

1. Dines, T (2008) A Vascular Plant Red Data List for Wales. Plantlife Wales
2. Guidelines for the Selection Of Wildlife Sites in South Wales (2004), The South Wales Wildlife Sites Partnership
3. Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS) Biodiversity Information Service for Powys and Brecon Beacons National Park. Available at <https://www.bis.org.uk/>. Data search undertaken on 30/06/2022
4. BSBI Botanical Society of Britain & Ireland data search undertaken on 13/10/2022
5. Sturgess Ecology (On behalf of Ove Arup and Partners) (2020) Vegetation surveys. Proposed Global Centre for Rail Excellence.
6. Photos *Typha angustifolia* | Online Atlas of the British and Irish Flora (brc.ac.uk)

D.5. Floating Bur-reed

Floating bur-reed (*Sparganium angustifolium*)

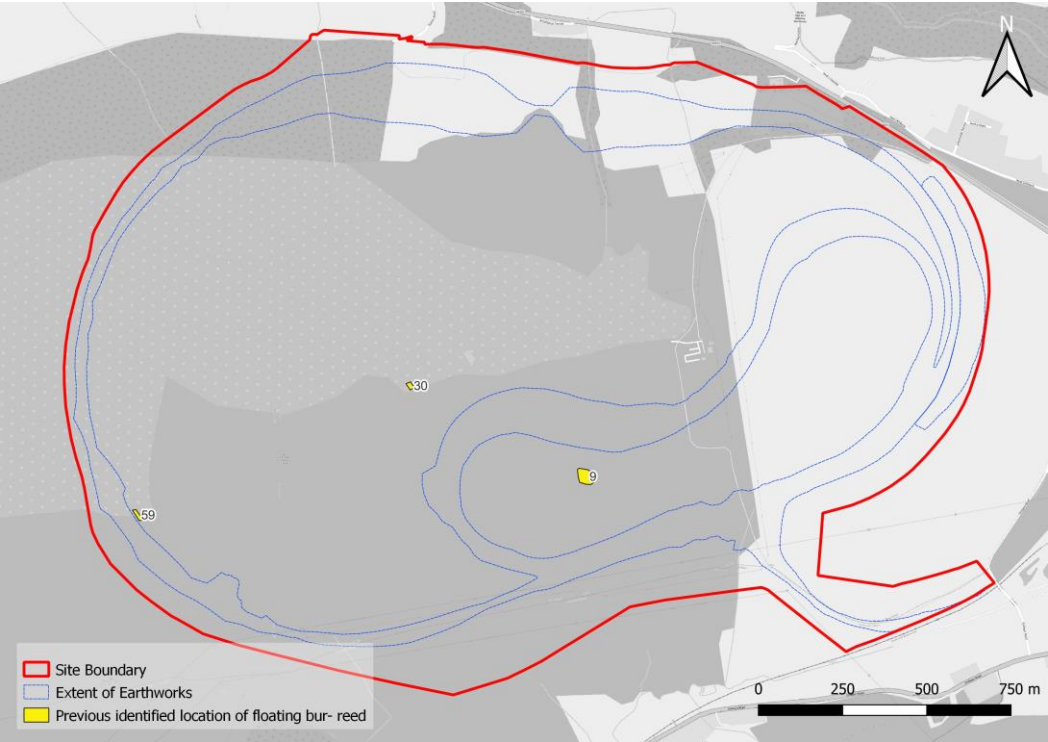
Background and Data Search

During the 2019 vegetation survey¹, floating bur-reed was recorded within Ponds 9 and 59 with the Nant Helen Site. Floating leaves, assessed as likely to be this species were also seen in Pond 30, but could not be confirmed due to an absence of flowering heads. Floating bur-reed was not identified within the Site boundary during the 2022 botanical survey, however this survey was outside of the optimal survey period. It is assumed that floating bur-reed is still present in the locations identified in the 2019 vegetation survey.

Floating bur-reed is noted in the South Wales Wildlife Sites Guidelines² - Primary Species list.

BIS³ provided three records of floating bur-reed from within 1 km of the Site. BSBI⁴ provided six records of floating bur reed within 2km of the Site, one of which was located within the Site boundary.

Figure 1. Plan showing site boundary, proposed extent of earth works and locations of floating bur-reed.



Ecology

- Perennial hydrophyte herb which is found in clear, low nutrient freshwater bodies.
- Produces a floating stem with slender, flattened leaves which can be of up to 2 m in length.
- Bears flowers in summer (typically in August and September), at which point the species is most easily identified to species level. They bear both male and female inflorescences, with the female inflorescence a circular burr-like fruit.
- Has a preferred water depth of 0.5-1.0 m deep.
- It is a rhizomatous plant, so tends to spread through underground stems called rhizomes which then send out roots and shoots from the nodes along the underground stem.

Photographs



Photo 1- Floating bur-reed with inflorescence⁵



Photo 2- Floating bur-reed inflorescence⁵

Proposed Actions

Surveillance for floating bur-reed will be implemented throughout the Nant Helen Site. Surveillance will be undertaken by carrying out pre works checks of areas of suitable habitat, and site staff being vigilant for the species. Should floating bur-reed be identified within the earth works footprint then works in that area will cease and advice will be sought from the Project Ecologist. Recommended measures may include digging up and translocation of any identified individuals to a suitable retained pond.

References

1. Sturgess Ecology (On behalf of Ove Arup and Partners) (2020) Vegetation surveys. Proposed Global Centre for Rail Excellence.
2. Guidelines for the Selection Of Wildlife Sites in South Wales (2004), The South Wales Wildlife Sites Partnership
3. Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS) Biodiversity Information Service for Powys and Brecon Beacons National Park. Available at <https://www.bis.org.uk/>. Data search undertaken on 30/06/2022
4. BSBI Botanical Society of Britain & Ireland data search undertaken on 13/10/2022
5. Photos Farmer, C. (2003) West Highland Flora. Floating Bur-reed *Sparganium angustifolium*. 03/05-08-2005 Portree/Dunvegan, Skye. Available at: <http://www.plant-identification.co.uk/skye/sparganiaceae/sparganium-angustifolium.htm> [Accessed on: 09/02/2023].

D.6. Spiked Water Milfoil

D.7. Greater Tussock Sedge

Appendix E. Zoning Plan



-  Site Boundary
-  Zone Plan (as of 01.02.2023)

Note: Zones 1A and 2A are outside of the Nant Helen Site Boundary.

Base Mapping: © OpenStreetMaps and its contributors

Atkins, Member of the SNC-Lavalin Group
2 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

Client
GCRE Limited

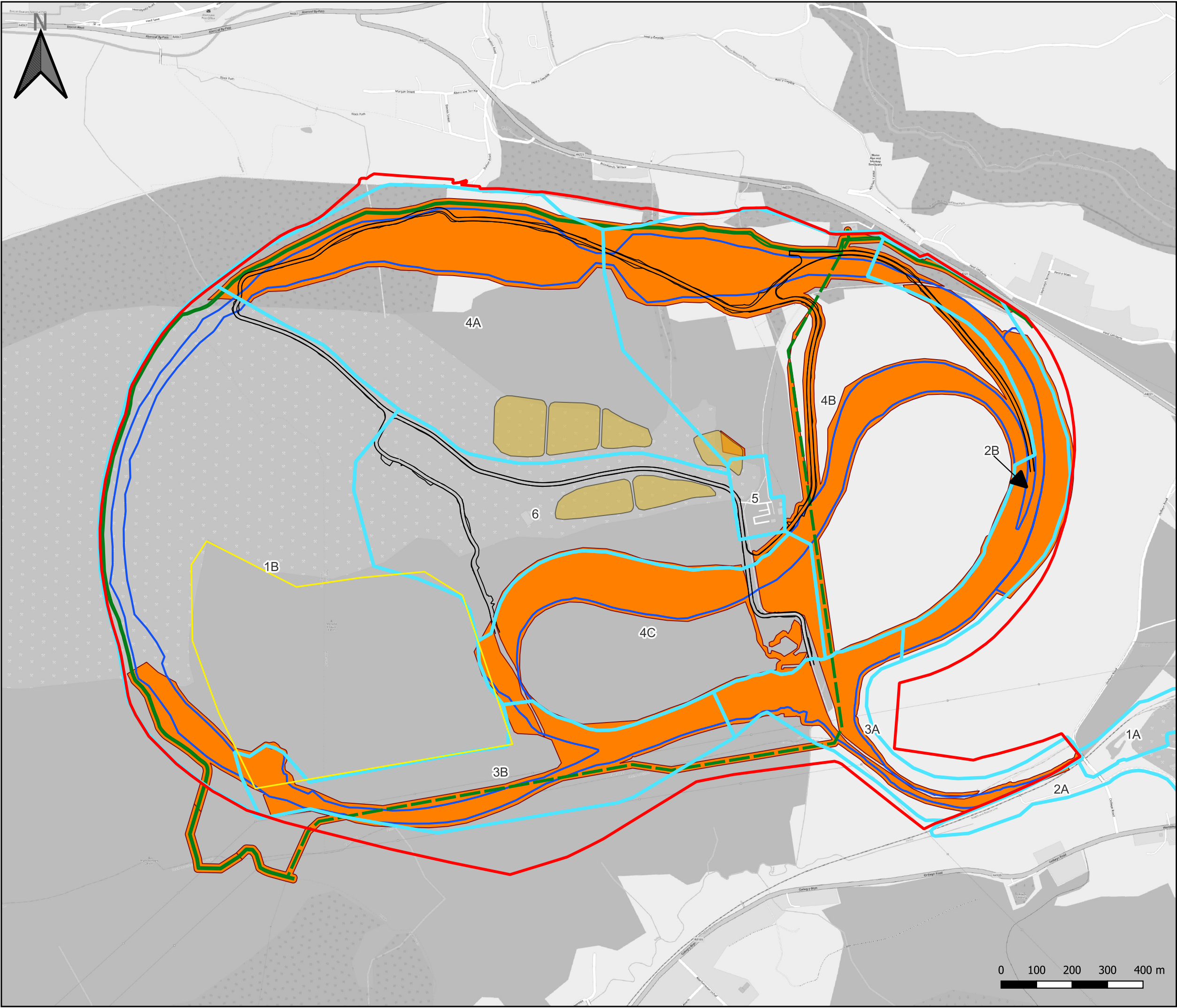
Project
Global Centre of Rail Excellence

Title
Construction Zone Plan

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		Date 02/02/23	Date 19/02/23	Date 22/02/23

Drawing Number	Rev
N/A	00

Appendix F. Ecological Constraints Plan



-  Nant Helen Site Boundary
-  Zone Plan (as of 01.02.2023)
- Scheme Construction Activities**
-  Earthworks
-  Dismantle 33/11KV overhead cable
-  Re-route 33/11KV cable underground
-  Haul routes
-  Soil stockpiles
-  Overburden mound
-  Areas of impact with ecological constraints

Note: Zones 1A and 2A are outside of the Nant Helen Site Boundary.

Base Mapping: © OpenStreetMaps and its contributors

Atkins, Member of the SNC-Lavalin Group
2 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

**ATKINS**
Member of the SNC-Lavalin Group

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Title

Ecological Constraints Plan

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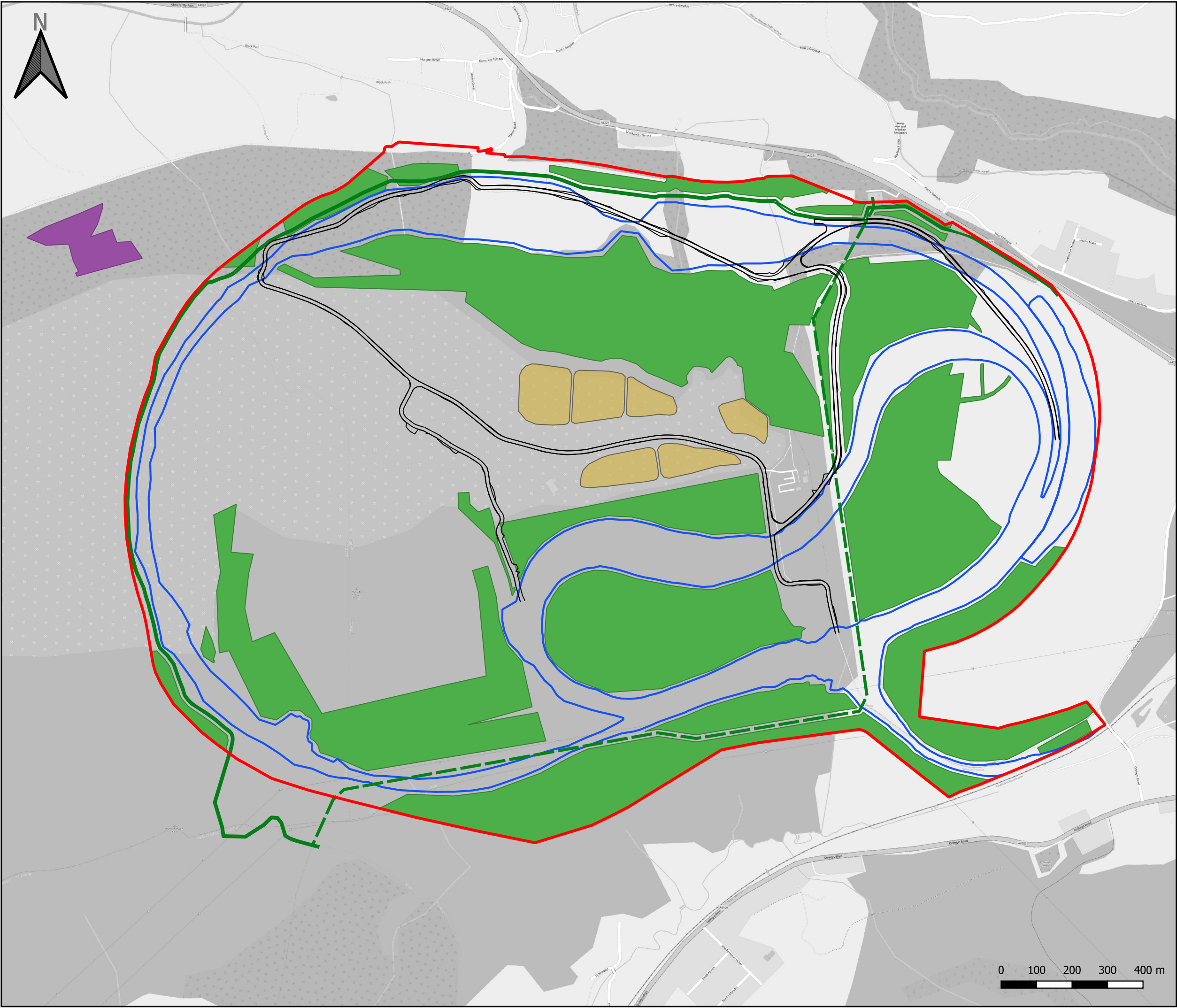
Drawing Number

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Appendix G. Biodiversity Protection Zones



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Site Boundary

Construction Activities

Earthworks

Dismantle 33/11KV overhead cable

Re-route 33/11KV cable underground

Haul routes

Soil stockpiles

Protected Areas

Biodiversity Protection Zone- Ecologically important habitat/ species to be protected throughout the construction activities

Ecologically important habitat to be created prior to construction

Base Mapping: © OpenStreetMaps and its contributors

Atkins, Member of the SNC-Lavalin Group
2 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ



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Global Centre of Rail Excellence

Title
Biodiversity Protection Zones

Sheet Size	Original Scale:	Design/Drawn	Checked	Reviewed
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		Date 04/04/23	Date 04/04/23	Date 05/04/23

Drawing Number	Rev
N/A	02

SNC-Lavalin
Two Chamberlain Square
Birmingham
West Midlands
B3 3AX

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