

Ffos-y-Fran Final Restoration Strategy

Ecological Impact Assessment (EclA)

for

MERTHYR (SOUTH WALES) LTD

December 2024

3274/11

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CONTENTS

	Page no.
1 INTRODUCTION	1
1.1 Scope of commission	1
1.2 Site description	1
1.3 Aims and objectives	2
1.4 Personnel and quality assurance	3
2 RESTORATION STRATEGIES	4
2.1 Evolution of strategy	4
2.2 Early restoration strategy	4
2.3 The final restoration plan	6
3 LEGISLATION AND PLANNING POLICIES	8
3.1 Legislation	8
3.2 Habitats and species	8
3.3 Environment (Wales) Act 2016	9
3.4 Well-being of Future Generations (Wales) Act 2015	10
3.5 Planning	10
3.6 Relevant guidance	14
4 ASSESSMENT METHODOLOGY	16
4.1 Review of previous work	16
4.2 Study Area - Zone of Influence (Zol)	18
5 APPROACH TO ESTABLISHING THE BASELINE	20
5.1 General Considerations	20
5.2 Desk study	21
5.3 Field survey	22
5.4 Protected Species Assessment	23
5.5 Great Crested Newts	23
5.6 Survey constraints and limitations	25
5.7 Consultation	25
6 ASSESSMENT METHODOLOGY	27

6.1	Assessment criteria and assignment of significance	27
7	BASELINE ECOLOGICAL CONDITIONS	30
7.1	Internationally designated sites	30
7.2	Nationally designated sites	30
7.3	Wildlife Sites / Sites of Importance for Nature Conservation (SINC)	30
7.4	Desk study results – Habitat	33
7.5	Desk study results – protected and notable species	34
7.6	Field survey results - Habitats	36
7.7	Field survey results - Priority habitats	43
7.8	Field survey results - protected and notable species	45
7.9	Priority and notable species	49
7.10	INNS	51
7.11	Summary evaluation of ecological baseline	51
8	DESCRIPTION OF PROPOSED WORKS	54
8.1	Final restoration proposals and objectives	54
8.2	Restoration Phase (Earthworks)	55
8.3	Timescales	56
8.4	Habitat creation	57
8.5	Aftercare and monitoring	57
9	POTENTIAL IMPACTS AND MITIGATION MEASURES	58
9.1	Background	58
9.2	Mitigation hierarchy	59
9.3	General avoidance	59
9.4	Minimise and mitigate	59
9.5	Restoration and enhancement	61
9.6	Compensation	61
9.7	Working methods	61
10	POTENTIAL IMPACTS AND MITIGATION MEASURES BY RECEPTOR	63
10.1	Non-Statutory Designated Sites	63
10.2	Habitats	65
10.3	Species	71

11	SUMMARY OF RESIDUAL EFFECTS	84
11.1	Likely residual effects	84
12	ASSESSMENT OF CUMULATIVE EFFECTS AND INTER-RELATIONSHIPS	91
12.1	Cumulative effects	91
12.2	Intra-project relationships	92
12.3	Inter-project relationships	95
13	AFTERCARE AND MONITORING	95
13.1	Summary of measures for the aftercare and monitoring period	95
14	CONCLUSIONS	98
15	REFERENCES	100

LIST OF TABLES

Table 1: The DECCA Framework

Table 2: Summary of Main Ecological Findings From Previous Reports

Table 3: Phase 1 Habitat Survey Target Notes (**Appendix B**)

Table 4: Pond HSI table (**Appendix D**)

Table 5: Categories of Significant Residual Effects from Scoping Report

Table 6: Categories of Significant Residual Effects

Table 7: Non-Statutory Designated Sites within 2 km

Table 8: Summary of Priority Habitats

Table 9: Summary of Priority Species

Table 10: Summary of Valuable Ecological Receptors (VERs)

Table 11: Summary of residual effects on Valuable Ecological Receptors



LIST OF FIGURES

Figure 1: Summary of the Stepwise Approach (source PPW12)

Figure 2: Phase 1 Habitat Survey Map (**Appendix A**)

Figure 3: GCN Surveys Pond Location Plan and eDNA Status (**Appendix C**)

Figure 4: Statutory Designated Sites for Bats Within 30km (**Appendix F**)

Figure 5: Sites of Special Scientific Interest Within 5km of ZOI (**Appendix G**)

Figure 6: Wildlife / Sites of Importance for Nature Conservation (SINC) within 2km (**Appendix H**)

Figure 7: Ancient Woodland Within 2km (**Appendix I**)

Figure 8: Orchid Location Plan (**Appendix J**)

LIST OF APPENDICIES

Appendix A; Figure 2: Phase 1 Habitat Survey Map

Appendix B; Table 3: Phase 1 Habitat Survey Target Notes

Appendix C; Figure 3: GCN Surveys Pond Location Plan and eDNA Status

Appendix D; Table 4: Pond HSI table

Appendix E; SureScreen GCN eDNA report

Appendix F; Figure 4: Statutory Designated Sites for Bats Within 30km

Appendix G; Figure 5: Sites of Special Scientific Interest Within 5km of ZOI

Appendix H; Figure 6: Wildlife / Sites of Importance for Nature Conservation (SINC) within 2km

Appendix I; Figure 7: Ancient Woodland Within 2km

Appendix J; Figure 8: Orchid Location Plan

Appendix K; Figure 9: Overlay of Proposed Earthworks and Phase 1 Habitat Map

Appendix L; Figure 10: Overlay of Proposed Earthworks and Pond Location Plan

EXECUTIVE SUMMARY

This report presents an Ecological Impact Assessment (EclA) of the proposed final restoration strategy for the former Ffos-y-Fran surface mine in Merthyr Tydfil, Wales. The assessment evaluates the potential impacts of the restoration on the site's baseline biodiversity, considering various ecological receptors such as habitats, species, and ecosystems.

The proposed scheme focuses primarily on the restoration of the area surrounding the main void and areas of overburden mound 1 (OB1). It includes the selective reduction and re-profiling of OB1, the retention of the open cliffs of the void and the re-profiling of its slopes leading down to a new permanent waterbody at the base. The plan also incorporates the planting of mixed woodland and the creation of rough grazing and pastureland on less steep slopes.

The assessment involved a thorough review of previous ecological assessments and reports, the collection of ecological baseline data through desk studies and field surveys and the establishment of study areas (Zones of Influence). This information was used to identify the presence of 'Valuable Ecological Receptors' (VERs), against which the significance of potential impacts resulting from the proposals were assessed. Mitigation measures were proposed following the mitigation hierarchy, prioritising the avoidance of significant impacts through retention of valuable habitats such as ponds, followed by minimisation, restoration, and compensation.

Due to the avoidance-based approach and the fact that the majority of disturbance will be localised to the area of least baseline value, potential impacts were found largely to be 'minor' in the absence of mitigation. The most likely potential impacts were thought to be represented by mobilisation of dust or run-off during earthworks. With the inclusion of achievable mitigation measures incorporated into the proposals, such as erosion and sediment control, the residual effects on all VERs were found to be neutral and beneficial over time.



As such, the proposed restoration strategy is expected to have an overall beneficial impact on the site's biodiversity, increasing it above baseline with time.



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1 INTRODUCTION

1.1 Scope of commission

1.1.1 Richards, Moorehead and Laing Ltd (RML) were commissioned by Merthyr (South Wales) Ltd to develop a restoration strategy at Ffos-y-Fran (hereafter referred to as the 'site'), centred on approximate Grid reference SO08040653.

1.1.2 This report has been produced to provide an Ecological Impact Assessment (EclA) of the proposed current restoration strategy. The report sets out the assessment of significant effects, either positive or negative, of the restoration proposals on the nature conservation interest at the site. A 'Significant effect' is an effect that either supports or undermines biodiversity conservation objectives for important ecological features¹.

1.2 Site description

1.2.1 The Ffos-y-Fran site, located approximately 1.5 km east of Merthyr Tydfil in South Wales, covers around 400 hectares of former surface mining land. This area was once part of the Gelligaer and Merthyr Common, an upland grassland used for grazing. The site features diverse habitats, including grasslands, woodlands, and aquatic environments, with acid grassland being the dominant feature. Historically, the area was integral to Merthyr Tydfil's industrial growth, which began in the 18th century and included deep coal mining until the 1980s. Over two centuries of mining activity left the land derelict and degraded.

1.2.2 To address this, the East Merthyr Reclamation Scheme (EMRS) was launched in the mid-1980s. The scheme, supported by local councils and the Welsh Development Agency (WDA), aimed to restore the landscape and eliminate hazards. It comprised three phases, with Phases I and II completed in 1993 and 1997, restoring over 100 hectares for residential, industrial, and recreational use. Phase III, known as the Ffos-

¹ CIEEM (September 2018 version 1.3 updated September 2024) *Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester. Available at [CIEEM-Guidelines-v1.3-Sept-2024.pdf](https://www.cieem.org.uk/wp-content/uploads/2024/09/CIEEM-Guidelines-v1.3-Sept-2024.pdf)

y-Fran Land Reclamation Scheme, involved extracting 10.8 million tonnes of coal through surface mining while reclaiming 367 hectares of land. This phase also involved removing numerous mine shafts and adits to eliminate safety risks. Although initial plans for Phase III were revised, the project was eventually approved in 2005, and mining commenced in 2007.

- 1.2.3 The mining operation, managed first by Miller Argent and later by Merthyr (South Wales) Ltd, continued until November 2023. After coal extraction ceased, the site's final restoration was planned.
- 1.2.4 Historically, the site housed the Dowlais Free Drainage System, which supported the Dowlais Ironworks and drained coal seams. Some features, like ponds and reservoirs, are now designated as Scheduled Ancient Monuments (SAMs), adding cultural and ecological significance to the area.

1.3 Aims and objectives

- 1.3.1 A request for a Screening opinion regarding the present scheme was submitted to Merthyr Tydfil County Borough Council (MTCBC) and the response received confirmed the need for an Environmental Impact Assessment (EIA) (**section 5.7** discusses consultations in more detail).
- 1.3.2 This was followed by submission of a scoping report, in response to which MTCBC stated their opinion as to the scope and level of detail to be provided within the EIA. This Ecological Impact Assessment (EcIA) aims to determine the significant impacts of the scheme, as they related to baseline ecology and biodiversity, through the following process:
 - **Establishing the baseline:** Collect and describe the existing ecological conditions at the site, prior to the proposed restoration, to inform the impact assessment.
 - **Identifying important ecological features:** Determine key ecological features (habitats, species, ecosystems, and their processes) that could be affected, considering their importance within a relevant geographical context.



- **Impact assessment:** Assess whether these important ecological features will be impacted, characterise the nature of these impacts, and evaluate the significance of residual effects after mitigation, including cumulative effects.
- **Mitigation, compensation, and enhancement:** Incorporate measures to avoid, minimize, or compensate for negative ecological impacts, and propose ecological enhancements. Monitor the success of these measures.
- **Implications for decision making:** Ensure that the assessment considers relevant legal and policy frameworks throughout the EclA process to guide decision-making.

1.4 Personnel and quality assurance

- 1.4.1 This report has been written by Dr Adam Lynch, reviewed by Donna Hall, approved by Jon Stoddard and issued by RML.
- 1.4.2 Ecologist & Environmental Scientist Dr Adam Lynch has a strong background in biological and environmental research, with a PhD in ecotoxicology which was a hybrid of his previous research interests (ecology and parasitology), looking at the effects of water pollution on aquatic parasite transmission. During his career in consultancy Adam has been involved in a wide range of projects of varying sizes, for which he has held roles including Ecological Clerk of Works and performed field surveys on mammal, invertebrate, reptile, fish and bird species. He has written and contributed to reports including Preliminary Ecological Appraisals, Habitats Regulations Assessments, Ecological Impact Assessments and Construction Environmental Management Plans.
- 1.4.3 Principal Ecologist Donna Hall is a full member of CIEEM with over 19 years of experience working within multi-disciplinary consultancies. Donna holds European Protected Species survey licences for bats and great crested newts, which cover all counties in England and Wales. Donna is also an accredited licence holder for dormice in Wales. She has written numerous Preliminary Ecological Appraisals and Ecological Impact Assessments for large and small schemes



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2 RESTORATION STRATEGIES

2.1 Evolution of strategy

- 2.1.1 The reclamation and restoration of the Ffos-y-Fran site, as part of the broader EMRS, has undergone a significant evolution in strategy due to financial, environmental, and practical challenges. The site, a 400-hectare area of former surface mining operations near Merthyr Tydfil, saw coal extraction cease in November 2023. This cessation marks a transition toward finalising a restoration plan that balances ecological, community, and economic objectives while adhering to regulatory requirements.

2.2 Early restoration strategy

- 2.2.1 Initially, under the Town and Country Planning (Minerals) Act 1981² and following the Reclamation of Mineral Workings (MPG7)³, the focus was on restoring mining areas to agricultural, forestry, or amenity standards. In 2003, a restoration plan for Ffos-y-Fran was developed, envisioning the complete refilling of the mining void and reshaping the land to reflect its pre-mining natural state. This traditional approach involved extensive earthmoving to return overburden from the site's mounds (OB1, OB2, and OB3) back into the void, creating a landform suitable for agriculture and grazing, with additional watercourses to support biodiversity.
- 2.2.2 A 2014 Welsh Government report⁴ highlighted the high costs associated with large-scale earthmoving and reclamation, estimating the total cost to restore Ffos-y-Fran at over £50 million. A later research briefing written by the Senedd⁵ noted the restoration costs to be between £75 million and £125 million - well beyond the £15 million bond set aside by the local planning authority. The 2014 report further states

² Available at <https://www.legislation.gov.uk/ukpga/1981/36/contents/enacted>

³ Available at <https://www.iow.gov.uk/azservices/documents/2782-A30-Minerals-Planning-Guidance-7.pdf>

⁴ Research into the failure to restore opencast coal sites in South Wales – Welsh Government – April 2014
Available at <https://www.gov.wales/sites/default/files/publications/2019-07/failure-to-restore-opencast-coal-sites-in-south-wales.pdf>

⁵ Restoration of opencast mines Research Briefing (Senedd July 2024). Available at <https://senedd.wales/media/iI0mrio4/24-15-opencast-mining-en.pdf>

that the cost of such bulk earthmoving “*can be reduced significantly by partially refilling the void, and reducing and softening the shape of the overburden mounds*”. This report, along with considerations regarding the substantial emissions which would be generated by machinery moving vast quantities of material, prompted a reconsideration of the original strategy, focusing on cost-effective alternatives that reduced the need for extensive earthworks while ensuring environmental restoration. Indeed, it is estimated that the proposed restoration strategy would see a 90% reduction in fuel consumption when compared with the consented scheme.

- 2.2.3 As a result of these findings, the strategy shifted toward partial refilling of the void and reshaping the overburden mounds, reducing costs and emissions by retaining parts of the void as water features. Other South Wales mining sites, such as East Pit and Margam, successfully implemented similar strategies, incorporating water bodies into the final landform. These alternatives were seen as more financially viable while still offering ecological and visual improvements.
- 2.2.4 In Ffos-y-Fran, the financial shortfall and increasing environmental concerns necessitated revisions to the original restoration plan. By 2016, when site ownership transferred to Merthyr (South Wales) Ltd (MSW), it became clear that a more affordable, sustainable plan was required. The focus turned to reducing bulk earthworks, retaining the revegetated OB2 and OB3 mounds, and developing the site for recreation to generate community benefits. These changes represented a pragmatic approach to restoration, one that sought to maximise ecological and social gains within the limited budget.
- 2.2.5 The final reclamation strategy was developed with two primary options. Of these, Option 2 emerged as the preferred approach, aiming for a "medium-level restoration" that partially refilled the mining void with 4.2 million cubic meters of overburden material from OB1. This would result in a landform with a height of 300 meters above sea level (AOD) and create a seasonal lake or wetland at the void's base to enhance biodiversity.

- 2.2.6 After the cessation of mining, groundwater levels stabilized within the void at around 280 meters AOD. Given the financial impracticality of continuing water abstraction, Option 2 was amended to incorporate a permanent body of water within the void. This feature not only addresses the water management challenge but also enhances the ecological potential of the area by providing a habitat for wildlife and supporting biodiversity targets. The retention of the water body aligns with modern environmental goals and net benefits for biodiversity (NBB), while also reducing the extensive earthmoving that would otherwise be required.

2.3 The final restoration plan

- 2.3.1 The revised Option 2 plan aims to balance cost-effectiveness with long-term ecological and social benefits. It has been presented to local stakeholders, including Merthyr Tydfil County Borough Council and Natural Resources Wales (NRW). The plan will include further technical assessments of hydrogeology, geochemistry, and landform, ensuring that it adheres to Environmental Impact Assessment (EIA) requirements.
- 2.3.2 The key features of the final restoration strategy are to minimise bulk earthworks by retaining the existing groundwater lake that has formed naturally in the main void following cessation of coal extraction and when the de-watering of the main void was no longer required.
- 2.3.3 The sides of the main void will be re-profiled and using existing spoil material and material from the overburden mound OB1. The height of OB1 would be reduced and re-profiled as a sinuous undulating ridge and areas of open rock face and scree retained for biodiversity and visual amenity. Existing ponds and water bodies, such as important relics of the previous industrial extractive industries will be retained and enhanced for nature conservation and preserved as heritage assets. The overburden mounds of OB2 and OB3 will be retained and returned to areas of upland grassland with areas of woodland planting and heathland on the flanks and lower slopes.
- 2.3.4 Key features of the final restoration plan include:



- **Water Features:** A permanent lake at the base of the void, contributing to biodiversity enhancement.
- **Landform Adjustments:** Re-profiling of OB1 slopes to improve visual amenity for local residents, while retaining the revegetated OB2 and OB3 mounds.
- **Ecological Conservation:** Restoration of the site to support mixed woodland, rough grazing, and acid grassland, as well as the protection of areas like the Central Ecological Area Site of Importance for Nature Conservation (SINC) and several Scheduled Ancient Monuments.

- 2.3.5 By amending Option 2 to retain the water body, the final restoration plan represents a more financially sustainable and environmentally conscious approach, offering significant benefits for local biodiversity and the community.
- 2.3.6 The reclamation strategies for the Ffos-y-Fran site evolved due to financial constraints, environmental considerations, and community engagement. The transition from a traditional, high-cost and high-emission restoration plan to the more achievable revised Option 2 reflects a pragmatic response to these challenges.
- 2.3.7 By incorporating a permanent water feature, retaining overburden mounds, and enhancing the site's recreational potential, the final plan seeks to leave a positive environmental and social legacy for the local area, balancing the demands of ecological restoration with community needs and financial realities.



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3 LEGISLATION AND PLANNING POLICIES

3.1 Legislation

- 3.1.1 The section outlines relevant legislative protection afforded to certain habitats and species.

3.2 Habitats and species

*Conservation of Habitats and Species Regulations 2017 (as amended)*⁶

- 3.2.1 This Act ensures the protection of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK which no longer form part of the EU's Natura 2000 ecological network. The amended regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes existing SACs and SPAs, new SACs and SPAs designated under these regulations. Any references to Natura 2000 in the 2017 Regulations and in guidance now refers to the new national site network.

*The Wildlife and Countryside Act 1981 (as amended)*⁷

- 3.2.2 This Act allows for designation of SSSIs related to flora, fauna, physiology, or geology. The Act makes it an offence to kill, injure, take, possess, or trade in many wild animal species and to pick, uproot, possess, or trade in several wild plants. Measures are also outlined to outlaw the spread of invasive non-native species (INNS). This Act also implements certain provisions of the Wild Birds Directive (2009/147/EC).

⁶ The Conservation of Habitats and Species Regulations 2017 (as amended) Available at <https://www.legislation.gov.uk/uksi/2017/1012/contents>

⁷ Wildlife and Countryside Act 1981 Available at (<http://www.legislation.gov.uk/ukpga/1981/69>)

Wild Mammals (Protection) Act 1996⁸

- 3.2.3 This Act provides protection against certain acts of deliberate harm for ‘wild mammals’ (meaning any mammal which is not a ‘protected animal’ within the meaning of the Animal Welfare Act 2006).

Protection of Badger Act 1992⁹

- 3.2.4 Badgers and badger setts are protected under the Protection of Badgers Act 1992. This makes it an offence to wilfully kill, injure or take a badger, intentionally or recklessly damage, destroy or obstruct access to a badger sett, or disturb a badger when it is occupying a sett

The Invasive Alien Species (Enforcement and Permitting) Order 2019¹⁰

- 3.2.5 The Order came into force on the 1st of October 2019 to allow for the enforcement of Regulation (EU) No. 1143/2014 on the prevention and management of the introduction and spread of invasive alien species in England and Wales including the relevant licenses, permits and rules for keeping invasive alien species.

The Countryside and Rights of Way Act 2000¹¹

- 3.2.6 An Act which provides for public access on foot to certain areas of land and strengthens measures to allow the management and protection of Sites of Special Scientific Interest (SSSIs).

3.3 Environment (Wales) Act 2016¹²

- 3.3.1 Welsh legislation confirms Wales’ legal commitment to biodiversity conservation. Section 6 of the Environment (Wales) Act 2016 introduced an “enhanced biodiversity and resilience of ecosystems duty (the S6 duty)” for public authorities, which requires that they “seek to maintain and enhance biodiversity so far as consistent with the

⁸ Available at <https://www.legislation.gov.uk/ukpga/1996/3/contents>

⁹ Available at <https://www.legislation.gov.uk/ukpga/1992/51/contents>

¹⁰ Available at <https://www.legislation.gov.uk/uksi/2019/527/contents>

¹¹ Available at <https://www.legislation.gov.uk/ukpga/2000/37/contents>

¹² Available at <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted>

proper exercise of their functions and in so doing promote the resilience of ecosystems”.

3.4 Well-being of Future Generations (Wales) Act 2015¹³

3.4.1 One of the seven goals of this Act is to strive for a resilient Wales. Both the Environment (Wales) Act and the Well-being of Future Generations Act frame biodiversity and its contribution to achieving ecosystem resilience.

3.5 Planning

Planning Policy Wales 12¹⁴

3.5.1 Planning Policy Wales 12 (PPW12) Section 6.4.3 sets out the responsibilities of the Local Planning Authority when assessing proposals and their impacts on biodiversity. This document states:

‘The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement’.

3.5.2 It sets out the requirement for planning authorities to demonstrate that they have sought to fulfil the duties and requirements of Section 6 of the Environment Act 2016 by taking all reasonable steps to maintain and enhance biodiversity in the exercise of their functions.

3.5.3 Policies relevant to nature conservation included into Planning Policy Wales can be summarised as follows:

- **Green Infrastructure:** to include the submission of proportionate green infrastructure statements with planning applications and signposting Building with Nature standards.

¹³ Available at <https://www.legislation.gov.uk/anaw/2015/2/contents>

¹⁴ Available at https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf

- **Net Benefit for Biodiversity and the Step-wise Approach:** The step-wise approach is the means of demonstrating the steps which have been taken towards securing a net benefit for biodiversity. In doing so, planning authorities must also take account of and promote the resilience of ecosystems, in particular the following attributes, known as the DECCA Framework¹⁵.
- **Protection for Sites of Special Scientific Interest (SSSI's):** strengthened approach to the protection of SSSIs.
- **Trees and Woodlands:** closer alignment with the stepwise approach, along with promoting new planting as part of development based on securing the right tree in the right place. Planning authorities must protect trees, hedgerows, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial green infrastructure function.

3.5.4 The stepwise approach is the means of demonstrating the steps which have been taken towards securing a net benefit for biodiversity, regarding the DECCA framework (**Figure 1**). The stepwise approach should be followed, with the result being enhancements to provide a net benefit for biodiversity.

3.5.5 The stepwise approach helps secure a net benefit for biodiversity, with the onus on applicants to bring forward proposals which will achieve a net benefit for biodiversity and demonstrate how the stepwise approach is applied.

¹⁵ Available at [Ecosystem Resilience in a Nutshell 1: what is ecosystem resilience? \(cyfoethnaturiol.cymru\)](https://cyfoethnaturiol.cymru/)

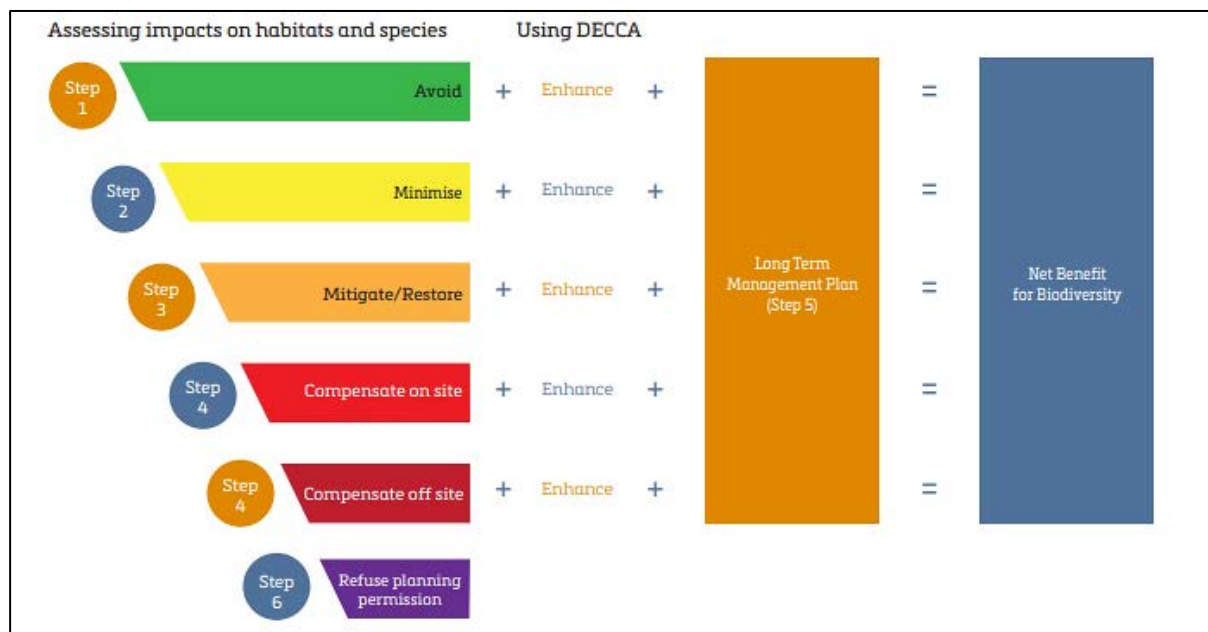


Figure 1: Summary of the Stepwise approach (source PPW12).

Technical Advice Note 5¹⁶

- 3.5.6 Technical Advice Note (TAN) 5 (Nature Conservation and Planning) provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. This guidance note should be read in conjunction with PPW12.

Adopted Local Development Plan (2016 -2031)¹⁷

- 3.5.7 The adopted Replacement Local Development Plan (current at the time of writing) for Merthyr Tydfil sets out several local policies to ensure the protection and development of biodiversity, notably; Ecw1.3 – Ffos y Fran, EnW1, EnW2, EnW3 and EnW4.

Mineral Technical Advice Note (MTAN) Wales 2: Coal (January 2009)¹⁸

¹⁶ Available at <https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf>

¹⁷ Available at <https://www.merthyr.gov.uk/media/6710/replacement-ldp-written-statement-final-composite-version-290120-type-set-from-donna-nrl.pdf>

¹⁸ <https://www.gov.wales/minerals-technical-advice-note-mtan-wales-2-coal>

- 3.5.8 The document emphasises the importance of considering the environmental impact of coal extraction and processing operations. It details the need for Best Available Techniques (BAT) to minimise pollution and environmental management programs for continuous improvement. The document also specifies the requirement for monitoring various environmental parameters, including water quality, gas emissions, and visual impacts.
- 3.5.9 Specific guidelines for protecting designated environmental areas like National Parks and SSSIs, and for mitigating impacts on water resources through a comprehensive assessment of quality and flow are included. It also addresses the protection of the historic environment and agricultural land quality.
- 3.5.10 Additionally, the document includes detailed guidance on minimising dust, noise, and visual impacts through various mitigation measures. It also emphasises the need for Health Impact Assessments (HIAs) and public participation in the decision-making process.

Mineral Planning Guidance 7: The Reclamation of Mineral Workings (August 1989)¹⁹

- 3.5.11 MPG7 provides guidance on the reclamation of mineral workings, emphasising sustainable practices to restore land for acceptable after-use while addressing ecological and environmental impacts. It outlines measures to minimise pollution, manage environmental impacts, and protect designated areas, with specific guidance on mitigating effects on water resources, dust, noise, and visual impacts. The document stresses the importance of ecological and environmental impact assessments, Health Impact Assessments (HIAs), and public participation, aiming to balance the needs of mineral extraction with positive outcomes for the environment and local communities.

¹⁹ <https://www.gov.wales/mineral-planning-guidance-7>

3.6 Relevant guidance

- 3.6.1 The assessment has been written in accordance with the best-practice guidelines provided by the Chartered Institute of Ecology and Environmental Management (2018) Version 1.3 - updated September 2024²⁰.

Net Benefits for Biodiversity and DECCA

- 3.6.2 The Net-Benefits for Biodiversity (NBB) approach, which is adopted in Wales, has the intention to deliver an overall improvement in biodiversity by putting an emphasis on proactive consideration of biodiversity and wider ecosystem benefits within a placemaking context to be considered early in the design process (Welsh Government (2021) Planning Policy Wales Edition 12²¹).
- 3.6.3 Natural Resources Wales (NRW) who are the Statutory Body and advisors to the Welsh Government and LPA's, have developed a framework for evaluating ecosystem resilience based on five attributes and properties specified in the Environment (Wales) Act 2016 and PPW. This is referred to as DECCA: Diversity, Extent, Condition, Connectivity and Aspects of ecosystem resilience (**Table 1**).

²⁰ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3 – Updated September 2024. Chartered Institute of Ecology and Environmental Management, Winchester.

²¹ PPW 12 accessed at <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>

Table 3: The DECCA framework

D	Diversity: at a biological level, including at the genetic, species, habitat, ecosystems or sea/landscape scale, as well as at the geological and physical level underpins biodiversity, resilient ecosystems, their functioning and the delivery of important ecosystem services. More diverse ecosystems are more resilient to external influences (this includes biological, geological and physical diversity on a site). This means strategic planning and individual development proposals should avoid negative impacts on biodiversity, by considering how biodiversity assets, can be maintained and enhanced.
E	Extent: to ensure mechanisms allow for the identification of potential habitat, the maintenance of existing biodiversity assets and networks and promote the restoration of damaged, modified or potential habitat and the creation of new habitat. This means that planning decisions should incorporate measures which seek the creation, restoration and appropriate management of green networks and linkages between habitats and maintaining and enhancing other green infrastructure features and networks.
C	Condition: Ecosystems and biodiversity assets need to be in a healthy condition to function effectively, to deliver a range of important ecosystem services. Planning decisions should not compromise the condition of ecosystems. By taking an integrated approach to development, for example, which considers both direct and wider impacts and benefits it should be possible to make a positive contribution. Planning for the long-term management of retained habitats is key to maintaining condition through for example, the use of planning obligations.
C	Connectivity: to take opportunities to develop functional habitat and ecological networks within and between ecosystems and across landscapes, building on existing connectivity and quality and encouraging habitat creation, restoration and appropriate management. The opportunities could include enlarging habitat areas, developing buffers around designated sites or other biodiversity assets or corridors, including transport and river corridors, and the creation of ‘stepping stones’ which will strengthen the ability of habitats and ecological networks to adapt to change, including climate change. Individual development proposals should identify and incorporate measures which enable appropriate links to be made between the site and its surroundings so as to improve connectivity.
A	Adaptation: resistance and recovery from pressures arise when the attributes of ecosystem resilience – diversity, extent, condition and connectivity of ecosystems are in good condition. Habitats and species are not static: planning for nature recovery should aim to sustain habitats and associated species as the geography and land use changes around them, harnessing natural processes and opportunities for nature-based solutions. This means that strategic planning and individual development proposals should identify impacts to the ecosystem resilience attributes of biodiversity, using the pressures identified in SoNaRR ²² . They should incorporate measures to ensure that biodiversity’s ability to adapt to, resist and recover from pressures is enhanced.

(Source: PPW 12)

²² Available at <https://naturalresources.wales/media/695923/sonarr2020-executive-summary.pdf>

4 ASSESSMENT METHODOLOGY

4.1 Review of previous work

4.1.1 A review of previous ecological assessments and reports for the scheme was made, the key findings of which are summarised in **Table 2** below.

Table 4: Summary of main ecological findings from previous reports

Report	Summary of main ecological findings
Miller Argent (2003). Ffos-y-Fran Land Reclamation Scheme: Environmental Statement	- No impacts on legally protected conservation sites. - Negligible effects on Tair Carreg Moor candidate SINC and certain bird species. - Minor adverse effects on protected bird species, UK BAP priority species, mammals, reptiles, and invertebrates. - Minor to moderate effects on Local BAP habitats, including water bodies, spoil areas, and acid grassland, as well as notable plants.
Miller Argent (2003). Ffos-y-Fran Land Reclamation Scheme: Environmental Statement – Appendix 4: Ecology surveys	- Moderate effects on EC Habitats Directive Annex II habitats and UK BAP and Welsh Assembly important habitats like upland heathland. - Heathland habitats degraded mainly due to overgrazing; negligible impact expected from the development. - Moderate effects on amphibians, especially the great crested newt, with mitigation measures planned. - No major ecological impacts identified. - Overall moderate ecological significance from the development. - Proposed ecological enhancements and management expected to benefit conservation interests.
RPS & Miller Argent (2015). Ffos-y-Fran Land Reclamation Scheme Restoration Plan. Restoration Plan Restoration Strategy Condition 50. A-PP 152-07-014. Phase 1.	- The site includes areas of upland heathland, purple moor grass and rush pastures, ancient and species-rich hedgerows, and upland oakwood which are priority habitats. Some will be lost through the operations. - Ponds and standing open water bodies are present on the site, some of which are important locally. Several will be lost but new ponds will be created during operations and on restoration. - Rivers and streams flow through the site, including the Nant Gyrawd which will be avoided. Others will be lost but reinstated on restoration. - The site supports a range of breeding birds, including lapwing, skylark, linnet and reed bunting. There will be some habitat loss but this will be mitigated through habitat creation. - Great crested newts and other amphibians are present. There will be habitat loss but new ponds have been created and further habitat improvements are planned.

Report	Summary of main ecological findings
	• Other protected and priority species present include bats, badgers and reptiles. Mitigation strategies are proposed for these. • The restoration strategy aims to recreate priority habitats such as acid grassland, heathland and woodland. • Habitat creation and management is proposed to maintain and enhance biodiversity. • Overall, some priority habitats and species populations will be negatively impacted but this will be mitigated through avoidance strategies, habitat recreation and species translocation. The longer-term aim is an overall improvement in biodiversity.
Pryce Consultant Ecologists (2019). Proposed Extension to East Merthyr Opencast Site. Preliminary Ecological Appraisal, Llanelli.	• Surveyed site has limited ecological value with species-poor grassland and sparse early-stage lichen/bryophyte growth. • Likely initial displacement of Skylarks and Meadow Pipits, but potential long-term ecological benefits post-restoration. • No European Protected or nationally protected species like bats or badgers detected. • Site supports a few important species like Hedgehog and certain birds, which may be affected by development in the short-medium term. • No Invasive Non-Native Species found on-site. • Ecological interest of the site isn't a significant barrier to proposed development. • Low existing biodiversity offers a chance for ecological improvement through development, with recommendations for habitat enhancement.
SLR (2022) S.73 Application to Vary Conditions 3 and 4. Environmental Addendum Chapter 15: Ecology.	• No major ecological impacts were identified after mitigation in the original Environmental Statement (ES), and the assessment remains valid. • The conditioned restoration plan offers long-term benefits to nature conservation interests at the Ffos-y-Fran Site. • Habitat enhancements and management in areas like Cwm Golau and the site centre provide suitable habitats for various species. • Progressive habitat restoration has been implemented throughout the mine's lifespan to support local wildlife populations. • Extending the mine's life to June 2023 and starting restoration by September 2023 will not cause significant additional ecological impacts, require further mitigation, or violate existing commitments. • Minor amendments, such as adjusting the post-construction monitoring of great crested newts, may be needed but will not affect overall mitigation or habitat creation efforts.

4.2 Study Area - Zone of Influence (Zol)

4.2.1 The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed scheme and associated activities.

4.2.2 The Zol for this assessment, established as part of the scoping process and with consultation, is determined by consideration of the likely significant effects, some of which extend beyond the redline boundary of the proposals. Surveys conducted in 2023 and 2024, as well as desk study information and information from existing reports provided useful data to establish the following potential effect pathways, which could include, but not necessarily limited to:

- Restoration activities: ground investigations, excavation, soil-forming material stockpiling, demolition.
- Restoration activities: Land-forming phase: redistribution of overburden, wildlife casualties, noise and vibration, hydrodynamic changes, water, and air pollution.
- Habitat creation phase: land use change, change in hydrology, run-off.
- Aftercare phase: maintenance, pollution incidents.

4.2.3 The study area (Zol) applied in this assessment has been established based on identified features of interest and how they may be affected by biophysical changes arising from the proposed reclamation and associated activities during site restoration activities. For consistency with the original 2003 planning application, the site boundary will remain the same. Identified features of interest and the required zone of influence for the assessment are:

- 30 km Special Areas of Conservation designated for bats.
- 10 km Other designated sites which form the national site network (former Natura 2000 sites).
- 5 km Nationally designated sites, such as SSSIs and Local Nature Reserves (LNRs).
- 2 km Locally designated Wildlife Sites.

-
- 4.2.4 For protected and otherwise notable species the desk study area would extend to 2 km and include records within the last 10 years.
- 4.2.5 The proposed study area for ecological field surveys included all land affected by the restoration scheme and immediately adjacent areas where accessible.
- 4.2.6 Based on current guidelines²³ ecology surveys have a life span which is dependent upon the species/habitat in question, as a guide surveys and reports between 18 months to three years old need to be reviewed and updated, as necessary. Any information more than three years old would certainly need to be repeated.

²³ Available at <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

5 APPROACH TO ESTABLISHING THE BASELINE

5.1 General Considerations

5.1.1 Current CIEEM guidance²⁴ states that *“ecological baseline conditions are those which exist in the absence of proposed activities. The impact assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the effects of a project.”*

5.1.2 When describing the baseline conditions in the context of an EclA it is important that it represents the conditions existing at the start of a specific proposed intervention, even where there has been previous work on the site which may have negatively impacted it. This approach remains important in the context of this restoration strategy for several reasons:

- **Reflecting Current Reality:** The baseline aims to provide a realistic snapshot of the site's current ecological state prior to the proposed restoration, regardless of past impacts. This is essential because the assessment must address the current conditions that the proposed restoration will directly affect, rather than any historical state that no longer represents the actual environment.
- **Clarity and Relevance:** Assessing the baseline based on the present conditions keeps the focus on the immediate ecological status, making the assessment relevant to current project goals and impacts. If past activities have degraded the site, these existing conditions form the context within which the new project will operate, allowing stakeholders to evaluate the real, current ecological needs and challenges.

²⁴Available at [EclA-Guidelines-v1.3-Sept-2024.pdf](#)

- **Avoiding Misleading Comparisons:** Using a historical baseline that no longer applies could obscure the true impact of the proposed restoration by implying an ecological condition that is no longer present. This would potentially overstate the project's negative impacts or obscure any positive contributions, leading to skewed interpretations and less effective mitigation or restoration planning.
- **Measuring Restoration or Improvement:** If the intervention seeks to restore or improve conditions, the degraded current baseline allows the project's positive impacts to be clearly measured and documented. This makes it possible to demonstrate the ecological gains achieved by the restoration relative to the present state, rather than an idealised or outdated condition.

5.1.3 In summary, even when past activities have degraded a site, establishing the baseline as the current condition ensures that the assessment remains accurate, relevant, and practically applicable to the intervention's goals and context.

5.1.1 As such, the baseline conditions at the site are taken as those present when the mine ceased to operate (Nov 2023) with the exception of the area covered by Phase 2A interim restoration proposals that are currently in progress and should be completed later on in 2024.

5.1.2 The established baseline conditions are not expected to differ significantly between the time of their assessment and the inception of restoration works subject to this EcIA.

5.2 Desk study

5.2.1 Third party consultation was undertaken as part of the proposal. Data was requested from SEWBReC, the Southeast Wales Biodiversity Records Centre on the 13th of July 2023 to obtain the following ecological data:



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- Details of any statutory and non-statutory nature conservation designations within 10 km²⁵ of the site, and
- Records of any legally protected or other notable species within 2 km of the site, and

5.2.2 Open source 1:25,000 Ordnance Survey mapping and Google Earth Pro satellite imagery were used to identify any mapped water bodies and watercourses within 500 m of the Site.

5.2.3 Magic²⁶ online mapping was interrogated to include 10 km around the site for designated sites within the National Site Network and Sites of Special Scientific Interest (SSSI) and Impact Risk Zones (IRZs) were also considered where applicable.

5.2.4 Natural Resources Wales Map Browser was searched for data relating to Local Nature Reserves²⁷.

5.2.5 Previous reports undertaken at and for the site were also interrogated for ecological information as discussed in **section 4.1** and **Table 2**.

5.3 Field survey

5.3.1 A walkover survey was conducted on the 9th and 10th August 2023 by Matthew Robson and Adam Lynch of RML to determine the current baseline conditions of the site. The survey area included all land affected by the proposed restoration and immediate adjacent land, where accessible. The weather conditions during the survey were warm and sunny with an ambient temperature of 23°C.

5.3.2 Habitats were described following the standard Phase 1 habitat survey methodology²⁸. The dominant plant species were recorded, and habitats were classified according to their vegetation types. Where appropriate, consideration was

²⁵ Only those sites within 2 km of the scheme proposals are reported within this document. SEWBReC data can be provided upon request.

²⁶ Available at <https://magic.defra.gov.uk/MagicMap.aspx>

²⁷ Available at [View open data on access, flood, habitats, landscapes, marine, designated land, water quality, and woodlands](#)

²⁸ JNCC. (2010) *Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit*. Joint Nature Conservation Committee, Peterborough.

given to whether habitats qualify, or could qualify, as a Habitats of Principal Importance following habitat descriptions published by the Joint Nature Conservation Committee (JNCC, 2008). The survey included the additional recording of specific features indicating the presence, or likely presence of, protected species or other species of nature conservation significance (also referred to as ‘notable’ species).

- 5.3.3 The scientific naming of plant species follows those in Stace (2019)²⁹. Habitats were marked on a paper base map and were subsequently digitised using a Geographical Information System (QGIS). Target notes (TN) were made to provide information on specific features of ecological interest or habitat features too small to be mapped. These are shown in **Appendix A; Figure 2** and described in **Appendix B; Table 3**.
- 5.3.4 Any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were sought during the habitat survey. Detailed mapping of such species; or a full survey of the Site for all invasive plant species is beyond the scope of this commission.

5.4 Protected Species Assessment

- 5.4.1 Any evidence, or potential for protected species and notable species were noted during the walkover survey conducted in 2023 and during the updated walkover conducted in 2024, specifically for otters and badgers. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement and supplemented by standard sources of guidance on habitat suitability assessment for key faunal groups.

5.5 Great Crested Newts

Habitat Appraisal

²⁹ Stace, C.A. (2019). *New flora of the British Isles*. Suffolk: C&M Floristics.

5.5.1 The Habitat Suitability Index assessment (HSI) was conducted to all suitable waterbodies within the site boundary and immediately adjacent ponds where access was possible. The survey was conducted between 11/06/2024 and 13/06/2024. The locations of the ponds are provided **Appendix C; Figure 3**. The appraisal was conducted in suitable weather conditions.

5.5.2 The HSI assessment follows a standardised process³⁰ using habitat components such as water quality, fish and/or waterfowl presence, and surrounding terrestrial habitat quality to derive a suitability score or 'index' (**Appendix D; Table 4**). Water bodies with high scores are considered more likely to support GCN than those with lower scores. HSI score ranges and the inferred suitability of ponds to support GCN are listed below:

- >0.5 = Poor suitability
- 0.5 -0.59 = Below average suitability
- 0.6 – 0.69 = Average suitability
- 0.7 – 0.79 = Good suitability, and
- >0.8 = Excellent suitability

eDNA Methodology

5.5.3 Samples were collected by Accredited Agents Robert Jones and Adam Lynch, in conjunction with the HSI, in suitable weather conditions. The protocol for sampling followed that outlined within the technical advice note for field and laboratory sampling of great crested newts³¹ which requires the collection of 20 x 30 ml subsamples from the ponds, spaced as evenly as possible around the pond margin.

³⁰ ARG UK (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom

³¹ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford

Once collected, the samples were sent off for analysis to SureScreen Scientifics (Appendix E).

5.6 Survey constraints and limitations

- 5.6.1 The habitat surveys were carried out at the optimal time of year (i.e. between May and October during the main flowering season). Identification of plant species was therefore not hampered, with most being clearly visible, allowing full determination of habitat types to be made.
- 5.6.2 No presence/absence surveys for GCN have been conducted owing to the potential health and safety risks and access constraints. Access to ponds was restricted owing to steep Visqueen lined and/or concrete slopes making access dangerous/difficult.
- 5.6.3 Records held by local ecological record centres, local recording groups and on the internet are often collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, rather, it may simply indicate a gap in recording coverage.

5.7 Consultation

- 5.7.1 A request for a screening opinion was submitted to Merthyr Tydfil County Borough Council by RML on behalf of Merthyr (South Wales) Ltd on 29th September 2023.
- 5.7.2 In a response dated 4th December 2023, MTCBC directed that having regard to the scale and nature of the proposed restoration strategy (i.e. the development and the environmental sensitivity of the site and complexity of the effects on the environment), that an EIA is required.
- 5.7.3 In accordance with article 14 of the EIA Regulations, a scoping report was submitted in July 2024 on behalf of MSW with the request that MTCBC state their opinion as to the scope and level of detail to be provided in the environmental statement (scoping opinion). The scoping report provided the following information:



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- i) a plan sufficient to identify the land;
- ii) a brief description of the nature and purpose of the development including its location and technical capacity;
- iii) its likely significant effects on the environment; and
- iv) such other information or representations as the person making the request may wish to provide or make.

5.7.4 A scoping response was received on 4th October 2024 in which MTCBC stated that the Environmental Statement submitted in relation to the proposed development should consider a number of topics, including Ecology and Biodiversity.

5.7.5 Additionally, MTCBC stressed that overburden mounds OB2 and OB3 must be included in the assessments, as they are integral to the wider restoration process.

5.7.6 With regard to the present report, MTCBC made reference to further specific advice on the scope of the ecology chapter which was provided by Natural Resources Wales in their letter dated 9th September 2024 and in an Internal Memorandum from the Council Ecologist dated 14th August 2024. Recommendations included further surveys, recommendations for enhancement, adherence to the Step-wise Approach and the production of separate Green Infrastructure Statement.

5.7.7 The comments received have been considered within the production of this EcIA.



6 ASSESSMENT METHODOLOGY

6.1 Assessment criteria and assignment of significance

- 6.1.1 The Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018 v1.3 – updated September 2024) are the current industry standard for ecological assessment and are therefore considered to be current good practice. The assessment of effects on ecological receptors and the assessment of the significance of effects was therefore undertaken in line with the CIEEM guidance.
- 6.1.2 Ecological impacts are determined by assessing several key characteristics. These include whether the impact is positive or negative, its extent (the geographical area affected), magnitude (size or intensity), duration (how long it will last), frequency and timing (how often and when it occurs), and reversibility (whether the effect can be undone). Positive impacts improve environmental quality, such as increasing species diversity, while negative impacts, like habitat destruction, reduce it.
- 6.1.3 To assess the significance of an impact, the assessment focuses on how these characteristics affect ecological features. For instance, the removal of a hedgerow may have little impact on the hedgerow itself but could significantly affect species that rely on it, like nesting birds. The timing of an activity, such as during breeding season, can also elevate the impact's significance.
- 6.1.4 Cumulative effects are important in ecological assessments, as minor impacts from different activities may combine to create a significant overall effect. Cumulative impacts are especially critical when species or habitats are already stressed and vulnerable.
- 6.1.5 Significant ecological effects are those that either support or undermine biodiversity conservation goals, and they are considered at different geographical scales, from local to international. If significant effects are identified, mitigation, compensation, or enhancement measures are recommended to align the project with conservation

objectives. The significance of an impact may influence project approval or require conditions to be imposed to ensure the protection of important ecological features.

6.1.6 A matrix is often used, as shown in **Table 5** as detailed within the Scoping Report³² to categorise significance of any changes to the baseline according to the environmental value of a specific feature and the magnitude of the expected impact on it. The CIEEM Guidelines avoid and discourage use of the matrix approach and categorisation, unless it forms part of a wider EIA, as such, in this instance, a matrix would be adopted as set out within the Scoping Report.

Table 5: Categories of significant residual effects from Scoping Report

	Magnitude of Impact (degree of change)					
		No Change	Negligible	Minor	Moderate	Major
Environmental Value (Sensitivity)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

6.1.7 In order to categorise the significance of residual effects, the approach outlined in CIEEM has been adopted³³. This is detailed in **Table 6**.

³² Stoddard, J (2024) Ffos y Fran Final Restoration Strategy Environmental Impact Assessment (EIA) Scoping Report for Merthyr (South Wales) Ltd.

³³ Box, J, Dean, M & Oakley, M (2017) An alternative approach to the reporting of categories of significant residual effects in Environmental Impact Assessment. In Practice – Bulletin of the Chartered Institute of Ecology and Environmental Management 97: 47-50

Table 6: Categories of significant residual effects

Geographical scale at which the residual effect is assessed as being significant following CIEEM EclA guidelines	Category of significant residual effect
International, national or regional	Major
Metropolitan, county, vice-county or other local authority wide area	Moderate
Local	Minor

- 6.1.8 CIEEM states that these categories of significance of residual effect should only be used following completion of the assessment of whether the residual effects are significant or not in terms of conservation objectives or conservation status with reference to an appropriate geographical scale. This table should be used to guide mitigation action at the appropriate geographical scale.
- 6.1.9 The proposal for the works at the site, and the potential for biodiversity gains means that overall, the proposals are likely to have a positive effect on the site's biodiversity, within a local context.



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7 BASELINE ECOLOGICAL CONDITIONS

7.1 Internationally designated sites

- 7.1.1 There are no internationally protected sites within a 10km radius of the site. The nearest is the Aberbargoed Grasslands Special Area for Conservation (SAC), which lies 10.7km to the south. The nearest Special Protection Area (SPA) is the Severn Estuary, which lies 32km to the south. There are also no Ramsar sites within 10 km of the site.
- 7.1.2 There is only one SAC where bats are a feature of interest located within 30 km of the site boundary, this is the Usk Bat Sites SAC which is located 11 km north east (**Appendix F; Figure 4**). The site encompasses a series of lesser horseshoe (*Rhinolophus hipposideros*) bat roosts, upland habitats, woodlands and cave systems located around the valley of the River Usk near to Abergavenny.

7.2 Nationally designated sites

- 7.2.1 There is one nationally designated site within a 2km radius of the survey site (**Appendix G; Figure 5**). This is the Cwm Glo a Glyndyrys Site of Special Scientific Interest (SSSI) located 1.9 km to the south-west. Cwm Glo a Glyndyrys is of special interest for its extensive areas of marshy grassland, species-rich neutral grassland, and acid grassland, and for the association of these habitats with others including woodland and heath.

7.3 Wildlife Sites / Sites of Importance for Nature Conservation (SINC)

- 7.3.1 There are 16 of these sites within 2 km of the site. These are detailed in **Table 7** and in **Appendix H; Figure 6**.



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Table 7: Non statutory designated sites within 2 km.

Site name	Site Designation	Distance from site	Reason for notification
Tair Carreg Moor	SINC	0 east	Extensive area of open countryside where semi-natural upland features predominate. Acid grassland, heath, and semi-improved acid grassland with at least 7 indicator species. Presence of <i>Sparganium angustifolium</i> . Locally significant populations of dragonflies.
Merthyr Common South	SINC	0 south	Large upland/semi-upland common along hill ridge between two major rivers. Comprises extensive unimproved and semi-improved acid grasslands, dry heathlands, and bracken slopes, together with acid flushes, marshy grasslands, wet heathlands, grass-heath, and gorse scrub, forming a complex mosaic.
Merthyr Common Central	SINC	0 south	Area of upland common land comprising a range of habitats including marshy grassland, acid grassland, wet and dry heath, and acid flush. Includes large and small ponds, one of which (Isaac Morgan's Pond) supports a diverse range of aquatic plant species and a good dragonfly fauna.
Cwm Golau	SINC	175 m south	Small semi-upland valley system alongside the course of the Nant Gyrawd on the eastern side of Merthyr Common. Comprises mainly valley side marshy grasslands, with unimproved and semi-improved acid grasslands and small areas of wet heathland.
Glynmil	SINC	185 m south	Mosaic of semi-upland ffridd habitats at the western edge of Merthyr Common, partly on old colliery spoil tips. Comprises mainly unimproved and semi-improved acid grasslands, with smaller areas of marshy grassland, acid flush, dry acidic heath, bracken slopes and scrub.
Cefn Gelligaer, West of Deri	SINC	480 m east	Extensive area of open countryside where semi-natural upland features predominate. Acid grassland, heath, and semi-improved acid grassland with at least 7 indicator higher plant species, and at least 8 species of waxcap fungi. Breeding Lapwing (northern part of area). Locally significant populations of dragonflies (ponds in north of area).
Blaenmorlais	SINC	1.13 km north	A large area supporting a mosaic of upland habitats at the western edge of Merthyr Common. Mainly acid grasslands with acidic flushes, grass-heaths, dry heathlands, marshy grasslands, bracken slopes and smaller areas of wet heathland and scrub.
Merthyr Common North	SINC	1.3 km north	Very extensive area of upland common land supporting a mosaic of both wet and dry moorland habitats. These include extensive areas of unimproved acid grassland, marshy grassland, dry heathland, and grass-heath, together with areas of wet heath, acid flush, bracken stands, scree and exposed gritstone bedrock.

Site name	Site Designation	Distance from site	Reason for notification
Pan March and Traed y Milwyr, Llechryd	SINC	1.49 km northeast	An extensive upland area supporting a mix of wet and dry acid grassland and heath. Dominant species include Purple Moor-grass, Heather, Bilberry, Mat Grass, Cross-leaved Heath, Deer-grass, Heath Rush, Soft Rush, Common Cotton-grass, and Sphagnum mosses. The area includes several flushes and ditches, with particularly diverse flushes located beside the Nant Pitwellt stream.
Pentrebach Tip	SINC	1.59 south	Large area of re-vegetated colliery spoil and ffridd. Semi-upland acid grasslands, dry heathland, and bracken slopes, with areas of marshy grassland, semi-natural woodland, and scrub. Also contains small areas of bare ground, semi-improved neutral grasslands, small streams, and outcrops. Regionally rare and scarce insect species are present on the tip.
Afon Taf	SINC	1.64 km southwest	The major river in the County Borough. Includes areas of bankside habitats, particularly towards the south where the river corridor is less industrialised than further north. Associated habitats are chiefly semi-natural woodland, including areas of ancient semi-natural woodland and linear wet woodlands. There are also numerous neutral grasslands, scrub patches and bracken stands, as well as small areas of marshy grassland and tall herb vegetation. Notable features of the river course include cobble banks which support localised plants. Otter occurs throughout the length of the river which is known to be of value to a wide variety of birds, fish, bats, and reptiles.
Pentrebach Fields	SINC	1.68 km south	Linear series of species-rich semi-improved neutral grassland fields alongside disused railway embankment. The short-grazed grasslands are dominated by fine-leaved grasses and support abundant mesotrophic herbs.
Bryniau	SINC	1.76 km northwest	Semi-upland site comprising a complex mosaic of mainly acidic habitats associated with disused quarries (Bryniau Quarries) and spoil tips. Main habitats are acid grasslands with bracken slopes, intermixed with numerous areas of acid flush and marshy grassland.
Rhydycar West	SINC	1.83 km southwest	Very extensive mosaic of ffridd enclosures supporting complex of semi-upland and lowland habitats, partly contained within conifer plantation. Main components are ancient semi-natural woodland fragments, other seminatural woodlands, wet heathland, dry heathland, marshy grassland, and semi-improved neutral grasslands.
Cyfarthfa Park	SINC	1.84 km northwest	No details available.

Site name	Site Designation	Distance from site	Reason for notification
Cwm Glo	SINC	1.87 km west	The SINC contains the CwmGlo a Glyndyrus SSSI which is of international significance for grassland fungi. Extensive areas of marshy grassland, species rich neutral grassland and acid grassland alongside woodland and heath supporting an impressive variety of protected, rare, and uncommon species including marsh fritillary butterfly (<i>Euphydryas aurinia</i>), Great Crested Newt (<i>Triturus cristatus</i>), big blue pinkgill (<i>Entoloma bloxamii</i>) and olive earthtongue (<i>Microglossum olivaceum</i>).

7.3.2 There are 11 areas of ancient woodland (either ancient semi-natural or restored) within 2 km of the site (**Appendix I; Figure 7**). The nearest lies 100 m to the south of the Site close to Bogey Road with the next nearest, 900 m to the south of the site at Pen-Coedcae.

7.4 Desk study results – Habitat

The following habitat records were returned for the site (within the last 10 years) from SEWBReC (JNCC alphanumeric codes in parentheses).

- Semi-natural Broad-leaved woodland (A1.1.1)
- Semi-natural Coniferous woodland (A1.2.1)
- Dense/continuous scrub (A2.2)
- Scattered scrub (A2.2)
- Unimproved Acid grassland (B1.1)
- Semi-improved Acid grassland (B1.2)
- Marsh/marshy grassland (B5)
- Acid flush (E2.1)
- Marginal/inundation vegetation (F2.2)
- Standing water (G1.1)
- Spoil (I2.2)
- Mine (I2.3)



- Ephemeral/short perennial vegetation (J1.3)
- Buildings (J3.6)
- Bare ground (J4)

7.5 Desk study results – protected and notable species

7.5.1 The following section presents the findings of the desk study (species records within 2 km of the site within the last 10 years) from SEWBReC.

Amphibians

7.5.2 There were 8 records of great crested newt (*Triturus cristatus*), returned within 2 km of the site of which three were recorded within Merthyr Common Central SINC and the other records located within ponds to the north of what is now OB3, within the red line boundary. OB3 is indicated by Target Note 3 on the Phase 1 plan, Merthyr Common Central SINC is indicated by Target Note 7.

Badger

7.5.3 There was one record returned for the site for badger (*Meles meles*), however there are numerous anecdotal reports of badgers entering Merthyr Common Central SINC from the south of Bogey Road.



Bats

7.5.4 There were 47 records of bat species recorded within 2 km and within the last 10 years. No records were from within the site itself although seven species have been specifically identified nearby:

- Brown long eared (*Plecotus auritus*)
- Common pipistrelle (*Pipistrellus pipistrellus*)
- Daubenton's bat (*Myotis daubentonii*)
- Lesser horseshoe bat (*Rhinolophus hipposideros*)
- Noctule bat (*Nyctalus noctula*)
- Serotine bat (*Eptesicus serotinus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)

Hedgehog

7.5.5 There were 11 records of hedgehog (*Erinaceus europaeus*) within 2 km of the site in the last 10 years. Two of the records were on the edge of the site close to the landfill site.

Invertebrates

7.5.6 There were 76 records returned within 2 km of the site in the last 10 years of which ten were recorded on site. The records returned from within the site were for dragonflies including black darter (*Orthetrum cancellatum*), black-tailed skimmer (*Sympetrum danae*), keeled skimmer (*Orthetrum coerulescens*), emperor dragonfly (*Anax imperator*) and the four-spotted chaser (*Libellula quadrimaculata*); damselflies including the scarce blue-tailed damselfly (*Ishnura pumilio*) and lepidoptera records included the small heath butterfly (*Coenonympha pamphilus*), a Section 7 species of the Environment Act (Wales) 2016.

Reptiles

- 7.5.7 No records of reptiles were returned within 2 km of the site from the last 10 years.

Otter

- 7.5.8 There was one record of otter (*Lutra lutra*). This was located within the now restored western bank of Merthyr Common, located to the south of the site adjacent to Bogey Road, dating from 2018.

Birds

- 7.5.9 There were 381 records comprising 76 species of bird recorded within 2 km of the site from the last 10 years. The majority of these occur to the moor to the east. Species records within the site included buzzard (*Buteo buteo*), cuckoo (*Cuculus canorus*), sand martin (*Riparia riparia*), ringed plover (*Charadrius hiaticula*) short-eared owl (*Asio flammeus*) and skylark (*Alauda arvensis*).

7.6 Field survey results - Habitats

- 7.6.1 The surveyed site area comprises office and education buildings, hardstanding, and activity infrastructure with extensive acid grassland, scrub, tall ruderal vegetation, and short ephemeral vegetation. The site is bounded to the north-east, east, and south by open countryside and common land, north-west by heathland, moorland, scattered woodland, and grazing pasture. To the west and northwest, the site is bordered by the A4060 and beyond the A4060 is the town of Merthyr Tydfil, and associated communities such as Dowlais, Penybryn and Abercanaid. The semi-natural habitats on the site are largely unmanaged, but biologically depauperate.
- 7.6.2 The main habitats recorded within the surveyed site are described in the following paragraphs and illustrated on the plan provided in **Appendix A; Figure 2**. JNCC habitat codes are presented in parenthesis.

Semi-natural broad-leaved plantation woodland (A1.1.1)

- 7.6.3 Broad-leaved woodland is present to the south-west of the site along Bogey Road. The trees in this location were stressed and in poor condition comprising small grouping of hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), dog rose (*Rosa canina*), silver birch (*Betula pendula*), sycamore (*Acer pseudoplatanus*), and grey willow (*Salix cinerea*). Understoreys were dominated by bramble (*Rubus fruticosus*), gorse (*Ulex europaeus*), and ivy (*Hedera helix*).

Mixed plantation woodland (A1.3.2)

- 7.6.4 Mixed plantation woodland is located as screening at the entrance to the site from the main road (A4060) including larch, silver birch, and willows (*Salix ssp.*).

Scattered broad-leaved trees (A3.1)

- 7.6.5 Broadleaved trees were notably absent within the wider site. Typically, species were comprised of occasional hawthorn and willow species, the latter of which were notable in locations such as the settling lagoons to the southeast of the site.
- 7.6.6 None of the trees were highlighted as having Tree Protection Orders (TPOs) and none are listed on the Ancient Tree Inventory³⁴.

Scattered scrub (A2.2)

- 7.6.7 Gorse is the ubiquitous scrub species on the site, notably on OB2 where it is colonising the southern-facing bank. OB2 is located to the northeast of the Central Ecological SINC. Areas of denser scrub, where present, was dominated by gorse and to a much lesser extent by butterfly bush (*Buddleja davidii*) and bramble (*Rubus fruticosus*).

Unimproved acid grassland (B1.1)

- 7.6.8 This habitat was primarily associated with the slopes of OB3, the majority of OB2 (apart from the northwest area) and the north and eastern slopes of OB1. Dominant

³⁴ Available at <https://ati.woodlandtrust.org.uk/>

species included wavy hair-grass (*Deschampsia flexuosa*), sheep's sorrel (*Rumex acetosella*), creeping thistle (*Cirsium arvense*), heath bedstraw (*Galium saxatile*) and coltsfoot (*Tussilago farfara*). Other species noted less frequently included creeping cinquefoil (*Potentilla reptans*), spear thistle (*Cirsium vulgare*), hop trefoil (*Trifolium campestre*) and mat-grass (*Nardus stricta*).

Semi-improved Acid grassland (B1.2)

- 7.6.9 Acid grassland is the dominant habitat blanketing the western side of the first phase restoration between the A4060 and the current workings. Although sown in stages, the resulting sward is remarkably homogeneous. Dominant species included common bent (*Agrostis capillaris*), creeping red fescue (*Festuca rubra* sp.), perennial ryegrass (*Lolium perenne*), annual meadow-grass (*Poa pratensis*) and clover (*Trifolium repens*). Development of the sward was indicated by forbs including sheep's sorrel (*Rumex acetosella*), crested dog's-tail (*Cynosurus cristatus*), creeping thistle (*Cirsium arvense*), bird's-foot trefoil (*Lotus corniculatus*), heath bedstraw (*Galium saxatile*) and mosses such as woolly fringe-moss (*Racomitrium lanuginosum*). Of note were two species of waxcap fungi; crimson waxcap (*Hygrocybe punicea*) and snowy waxcap (*Cuphophyllus virgineus*).

Marshy grassland (B.5)

- 7.6.10 The small parcels of marshy grassland contained an area of poorly drained species-poor acid/neutral flushes characterised by moss carpets and juncus species such as flowering rush (*Juncus effusus*), wavy hair grass (*Deschampsia flexuosa*) and small sedges (*Carex* sp.). Additional species included creeping thistle (*Cirsium arvense*), crested dog's-tail, meadow buttercup (*Ranunculus acris*), selfheal (*Prunella vulgaris*) and common mosses including haircaps (*Polytrichastrum* sp.) and feather-moss (*Eurhynchium* sp.).

Tall ruderal (C3.1) and Bracken (C1.1)

- 7.6.11 Tall ruderal species were widespread across the site. Typically associated with disturbed ground. Species included scattered curled dock (*Rumex crispus*), common knapweed (*Centaurea nigra*) creeping thistle, mugwort (*Artemisia vulgaris*), common nettle (*Urtica dioica*), hoary willowherb (*Epilobium parviflorum*) and rosebay willowherb (*Chamerion angustifolium*). Rarely; species including great mullein (*Verbascum thapsus*), perforate St John's-wort (*Hypericum perforatum*) and foxglove (*Digitalis purpurea*) were also present.
- 7.6.12 Bracken (*Pteridium aquilinum*) was present in shaded areas along the stream banks associated with the 'Bargoed Taf' running along the west and south of OB3. Scattered goat willow (*Salix caprea*) was also present, growing out of gabions and within damper areas.

Acid flush (E2.1)

- 7.6.13 This habitat was found adjacent to the stream 'Bargoed Taf' south of OB3 and to the north of the site, associated with the area of marshy grassland.
- 7.6.14 Several grass species were present throughout, including reed sweet-grass (*Glyceria maxima*), wavy hair-grass (*Deschampsia flexuosa*), purple moor grass (*Molinia caerulea*), floating sweet-grass (*Glyceria fluitans*) and creeping bent (*Agrostis stolonifera*). Herbaceous plants included foxglove (*Digitalis purpurea*), rosebay willowherb (*Chamaenerion angustifolium*), marsh thistle (*Cirsium palustre*), eyebright (*Euphrasia officinalis*) and horsetail (*Equisetum arvense*). Other species frequently noted include bird's-foot trefoil (*Lotus corniculatus*), ribwort plantain (*Plantago lanceolata*) and common gorse (*Ulex europaeus*).

Wet dwarf shrub heath (D2)

- 7.6.15 This habitat was present in a small area at the northeast base of OB3. Evergreen shrubs found primarily consisted of common gorse (*Ulex europaeus*) and cross-leaved

heather (*Erica tetralix*). Cryptogamae species were noted as compact bogmoss (*Sphagnum compactum*), reindeer lichen (*Cladonia portentosa*) and common dog lichen (*Peltigera membranacea*). The dominant grass species was purple moor grass (*Molinia caerulea*) and the dominant rush was heath rush (*Juncus squarrosus*).

Lichen/bryophyte heath (D3)

- 7.6.16 This habitat was present between OB3 and OB1, along the banks of a cutting formed for a disused section of the railway track. Abundant mosses were heath star moss (*Campylopus introflexus*), common haircap moss (*Polytrichum commune*) and compact bogmoss (*Sphagnum compactum*). The most frequently recorded lichen species were common dog lichen (*Peltigera membranacea*), cup lichen (*Cladonia fimbriata*) and reindeer lichen (*Cladonia portentosa*).

Dry heath/acid grassland (D5)

- 7.6.17 Found on the top of OB2, this habitat consisted primarily of evergreen shrubs such as of common heather (*Calluna vulgaris*), bell heather (*Erica cinerea*), common gorse (*Ulex europaeus*). Grass species were also present included wavy hair-grass (*Deschampsia flexuosa*) and mat-grass (*Nardus stricta*). Heath rush (*Juncus squarrosus*) was also present sporadically.

Wet heath / acid grassland (D6)

- 7.6.18 This habitat was found in a small section to the east of OB3 and was more established at the western edge and surrounding the northern and eastern boundary to the central ecological zone. Grasses, rushes and sedges were common and included wavy hair-grass (*Deschampsia flexuosa*), mat-grass (*Nardus stricta*), purple moor grass (*Molinia caerulea*), heath rush (*Juncus squarrosus*) and small sedges (*Carex sp.*). Moss, primarily compact bogmoss (*Sphagnum compactum*), was often interspersed with rushes and sedges. Occasional evergreen shrubs, common heather (*Calluna vulgaris*) and common gorse (*Ulex europaeus*), were also scattered throughout.

Standing water (G1)

- 7.6.19 Numerous waterbodies were noted during the survey. These comprise settling ponds, reservoirs for dust suppression and wheel washing and ponds established during the first phase of restoration and ephemeral ponds that have formed on the overburden mounds. The ponds within Merthyr Common Central SINCs (located outside of the red line boundary) are of the most biodiversity value on site containing numerous macrophytes and fringe habitats. Further information on ponds is provided in **7.8.8 (Amphibians)**.

Running water (G2)

- 7.6.20 This habitat is primarily associated with the stream ‘Bargoed Taf’ running along the west and south of OB3. The section of the stream within the site boundary has been subject to past enhancements and consists of ‘rock armour’ bedding, with banks built over hessian matting. A number of gabions have been added to retain the profile and prevent erosion. The stream was generally clear, vegetation was minimal with some areas of floating sweet-grass (*Glyceria fluitans*), broad-leaved pondweed (*Potamogeton natans*), marsh pennywort (*Hydrocotyle vulgaris*) and common rush (*Juncus effusus*) at the margins. Goat willow (*Salix caprea*) has established on some of the gabions.

Spoil (I2.2)

- 7.6.21 Spoil from the current coaling operations built up on the western overburden benches of the void via haul roads. Other spoil includes soil stockpiles around the site which are now vegetated and bare overburden directly to the west of the northern viewing platform.

Mine (I2.3)

- 7.6.22 The central opencast void is largely devoid of biological interest. Ledges below the viewing platform to the south-east of the mine are sparsely populated with gorse and

short ruderals such as colt's-foot. The higher of the opencast's northeastern benches are being used by several species of gulls, corvids, and feral pigeons, whilst peregrine falcons are using the same in prospecting for food.

Ephemeral/short perennial vegetation (J1.3)

- 7.6.23 Species within these groups were widespread on site in varying densities. The dominant ruderal on site was colt's-foot (*Tussilago farfara*), found on all substrates including bare spoil, soil-forming material, and vegetating overburden mounds. Other recorded species within these groups included oxeye daisy (*Leucanthemum vulgare*), creeping buttercup (*Ranunculus repens*), lesser hawkbit (*Leontodon saxatilis*) and greater plantain (*Plantago major*).

Fence (J2.4)

- 7.6.24 Post and wire fences and post and rail fences, either as standalone barriers or in association with species-poor hedgerows are present around the site. None were considered to have any ecological value.

Buildings (J3.6)

- 7.6.25 The main structures on site are those associated with recent mining works, including conveyors, workshops and temporary welfare units. These structures are semi-permanent, generally consisting of sheet metal.

Bare ground (J4)

- 7.6.26 Bare ground was a feature of trackways within the site, the contoured top of OB3 and sections of the north-western side of the site between the soil mounds adjacent to the A4060 and the fresh spoil mounds.

7.7 Field survey results - Priority habitats

7.7.1 **Table 8** lists the habitats found within the surveyed area and whether these habitats are listed as Priority Habitats in Section 7 of the Environment (Wales) Act 2016³⁵.

Table 8: Summary of Priority Habitats

Habitat Ref	Habitat Description	Priority Habitat	Site Context/Justification
A1.1.2	Broadleaved woodland plantation	✓	Fragments of lowland mixed deciduous woodland are present along the edge of Bogey Road and sections of the A4060.
A1.2.1	Coniferous semi-natural	x	Small stands of larch dominated woodland located within the SINC.
A1.3.2	Mixed plantation woodland	x	Screening entrance to the site from the main road, including larch, silver birch, and willows (<i>Salix</i> spp.).
A2.1	Dense/continuous scrub	x	The dense scrub was dominated by gorse, vegetating the three overburden mounds with varying degrees of success.
A2.2	Scattered scrub	x	Gorse and to a much lesser extent, bramble and butterfly bush were scattered across the site.
A3.1	Scattered broad-leaved trees	x	Occasional specimens, typically scrub species such as hawthorn and willow.
B1.1	Acid grassland	x	Acid grassland is the dominant habitat across the site. Occasional scrub and frequently occurring leguminous species have been introduced to the seed bank during restoration of the western side of OB1. Elsewhere, natural recolonisation is taking place with occasional forbs.

³⁵ Available at <https://www.biodiversitywales.org.uk/environment-wales-act>

Habitat Ref	Habitat Description	Priority Habitat	Site Context/Justification
B2.2	Semi-Improved neutral grassland	x	Semi-improved neutral grassland is found within Merthyr Common Central SINC where it appears as tussocky, species-poor grassland with waterlogged area to the periphery
B5	Marshy grassland	x	An area of the semi-improved grassland contained a parcel of poorly drained species-poor acid/neutral flushes, characterised by moss carpets and juncus species. Also found within the gabion enhanced section south of OB3.
C3.1	Tall ruderal	x	Tall ruderal species were widespread across the site associated with disturbed ground.
E2.1	Acid flush	✓	Important habitat adjacent to Bargoed Taf and numerous other lower order watercourses/streams traverse the site with similar future potential.
F2.2	Marginal/inundation vegetation	x	A developing feature within some of the ponds on site – notably within the SINC.
G1	Ponds – Standing water	✓	Three ponds are located within the site offering habitat for great crested newt which are known to be present on site.
G1.3	Running water	✓	Present in several locations in the form of first order streams and their tributaries,

Habitat Ref	Habitat Description	Priority Habitat	Site Context/Justification
I2.2	Spoil	x	Extensive tracts of overburden within the site slowly colonising with rank grasses, tall ruderals, and scattered scrub. Bare spoil is also currently being tipped within the void as part of the reclamation process.
I2.3	mine	x	Artificially created cliffs within the void are becoming vegetated with scrub and short perennials whilst providing perching (nesting) opportunities for birds.
J1.3	Ephemeral/short perennial	x	Ephemeral and short perennial vegetation is widespread across the site particularly on re-colonising spoil heaps and waste ground as part of habitat mosaics.
J2.4	Fence	x	Widespread but devoid of ecological value.
J3.6	Buildings	x	Numerous functional buildings on site with negligible habitat potential. One derelict building within the SINC providing a roost for barn owls.
J4	Bare ground	x	This habitat was limited to occasional patches within the to the west of the site and the top of OB3.
Key: ✓ Listed as priority habitat X Not listed as priority habitat			

7.8 Field survey results - protected and notable species

- 7.8.1 The following section presents the findings of the ecological surveys conducted on the 10th and 11th of August 2023 and between 11th and 13th June 2024.
- 7.8.2 Where a species or species group has been omitted, this is due to there being no evidence or no suitability on site to support the species and as such are not considered to be affected by the schemes proposals.



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Flora

- 7.8.3 No species of note were recorded during the survey conducted in 2023. In 2024, naturally colonising Southern marsh orchids (*Dactylorhiza praetermissa*) were found growing within the damp marginal vegetation around four separate ponds inside the Site and two ponds inside the central ecological area (**Appendix J; Figure 8**). Identification between marsh orchid species can be challenging but the geographical location, time in-flower and previous confirmed records within 2km of the Site³⁶, suggest that this is correct.
- 7.8.4 The species, in-flower from mid-May to mid/late July, is not considered common but is fairly widely distributed across south Wales and can be abundant within specific areas of favourable habitat.
- 7.8.5 Like many wildflower species, *D.praetermissa* prefers alkaline to neutral soils and is often associated with previously disturbed post-industrial land, especially quarries, clay-pits and colliery tips.
- 7.8.6 The species, important to a range of pollinating insects, is generally considered to be an indicator of positive wetland biodiversity and ecosystem health, suggesting favourable conditions are achievable within the Site relatively quickly and with minimal effort, via natural colonisation processes.

Reptiles

- 7.8.7 Much of the site has reduced habitat suitability for reptiles (exposed acid grassland, bare spoil, and hardstanding particularly). However, there are some suitable areas which offer more habitat structure and diversity within the surveyed area, these include pond fringes, and the un-managed habitat mosaics on the lower reaches of the overburden mounds and the scrub/bare ground mosaic to the west of the site.

Amphibians

³⁶ Available at <https://records.nbnatlas.org/occurrences/003ce487-d013-4d9d-b939-04a9280c4e06>

- 7.8.8 The Merthyr Common Central SINC part of the site and habitat creation along the Bargoed Taf include areas of semi-improved and marshy grassland, scattered with tall ruderals, scrub and ponds. The suitability of the habitat for amphibians in these locations appears excellent in terms of foraging, cover, and for breeding. The naturally forming ephemeral ponds within areas of bare ground/spoil to the west of the site and atop OB2 have the potential to develop suitable cover, dispersal, and foraging opportunities for amphibians. Accidentally created refugia are present into the west of the site. However, significant barriers to dispersal exist on site, and the majority of the created waterbodies on site are artificially lined reducing the potential for colonisation by macrophytes.
- 7.8.9 The ponds within Merthyr Common Central SINC appear to be the most natural and optimal for amphibians. Historical records of GCN were returned for these locations (most recently from 2004) but also anecdotally for eel (*Anguilla anguilla*) and heron (*Ardea cinerea*) which if true, may account for the lack of any contemporaneous records.
- 7.8.10 A total of 30 ponds were surveyed, all of which were originally established in connection with mining operations. The majority of these were located within the redline boundary of ownership with several located within the Central Ecological Area located south of Bogey Road and north of OB3. Of the 30 ponds 3 were not accessible or were no longer there, however, additional suitable ponds were noted and surveyed.
- 7.8.11 The eDNA results indicated positive presence of GCN in 17 out of the 30 ponds, see drawing **Appendix C; Figure 3** for the location of ponds. Results of the eDNA and HSI scoring for pond suitability are shown in **Appendix D; Table 4**.

Badger

- 7.8.12 No field signs attributable to badger were noted during the surveys. Anecdotal evidence suggests that badgers may be entering the SINC to forage from the wider

countryside, although the nearest confirmed record was some 50 m from the site boundary.

Bats

- 7.8.13 None of the trees within the surveyed area were of suitable size or suitability for bat roosting potential. The main buildings on site, comprising the coal washing plant, workshops, and offices, were considered unlikely to support roosting bats due to the materials used in their construction and generally open aspect.

Birds

- 7.8.14 The tall ruderal habitat, woodlands, hedgerows, and scattered trees all provide suitable nesting and foraging habitat for birds. Birds were not in abundance during the survey although localised areas such as the higher faces of the opencast void were well populated by scavengers such as gulls and corvids, likely due to the presence of the Trecatti landfill site immediately to the north. Those species commonly encountered included crow (*Corvus corone*), raven (*Corvus corax*), feral pigeon (*Columba livia*), magpie (*Pica pica*), black-headed gull (*Chroicocephalus ridibundus*), herring gull (*Larus argentatus*), kestrel (*Falco tinnunculus*) and lesser black-backed gull (*Larus fuscus*). Additional species of note comprised pied wagtail (*Motacilla alba*), stonechat (*Saxicola rubicola*), skylark (*Alauda arvensis*), wheatear (*Oenanthe oenanthe*) and willow warbler (*Phylloscopus trochilus*). Buzzards (*Buteo buteo*) were also noted in the general area, flying at height. Of particular interest were a male peregrine falcon, a Schedule 1 species, observed flying across the northern and south-eastern faces of the opencast void and a female, guarding a kill on top of OB1, and within the derelict house at the conservation area; a pair of barn owls (*Tyto alba*) were observed roosting. This species is listed on both Schedule 1 and 9 of the WCA 1981.

Hedgehog



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- 7.8.15 Hedgehogs are conspicuously absent from marshland and open moorland habitat of the kind that encompass much of the Site and, as such, records are sparse. However, this species could utilise the site boundaries and areas of habitat mosaic such as within the SINC and dense scrub for foraging and dispersal into the wider landscape.

Invertebrates

- 7.8.16 Due to the site's low floristic diversity and significant areas of hardstanding, the main area disturbed by the scheme has reduced potential for invertebrate species in its current state, except for damper field margins and mosaic habitats including the SINC's habitat mosaic and associated small woodland blocks.

Otter

- 7.8.17 Otter numbers in Wales have shown a decline in recent years and no field signs attributable to otter were noted during the surveys. However, anecdotal evidence suggests that the species may be entering the SINC to forage. The sighting of an otter on the northwest of the site recorded in 2018, and the presence of watercourses within, and adjacent to, the site, suggest the probability that otters may be present in other areas on site.

7.9 Priority and notable species

- 7.9.1 **Table 9** lists the species with known presence or potential to be present on the site which are Priority Species listed on Section 7 of the Environment (Wales) Act 2016 **or** are considered notable and relevant to the site in question. The Act places duties on Welsh ministers to list species considered to be of key significance to Welsh biodiversity.



Table 9: Summary of Priority Species

Species group	Species	Site Context
Reptiles	Slow-worm Common lizard	Some limited suitable habitats on site.
Amphibians	Common frog Great crested newt	GCN recorded on site in 2004. Positive evidence from eDNA sampling. Suitable breeding habitat within the site. Sub-optimal habitat for dispersal, foraging and refugia. Common frog noted during survey. Habitat constraints for GCN also applicable to frogs.
Birds	Merlin Barn owl Black-headed gull Dunnock Grasshopper warbler Hen harrier Herring gull Lapwing Peregrine falcon Pied flycatcher Reed bunting Skylark Song thrush Starling	The streams, pond fringes, marshy/tussocky grassland, trees, artificial cliffs, and woodland provide suitable nesting and foraging habitat for birds.
Mammals	Bats	Roosts not known to be present on site. The existing grassland and occasional treelines may provide some foraging opportunities although good quality commuting corridors and connectivity to the wider landscape are lacking.
	Badger	Some commuting/foraging within sections of the site. Suitable foraging within conservation area.
	Hedgehog	Suitable habitat within the field boundaries and scrub/mosaic habitat.

Species group	Species	Site Context
	Otter	Believed to be foraging within watercourses within sections of the site, most suitable habitat within the conservation area.

7.10 INNS

7.10.1 Small amounts of buddleia (*Buddleja davidii*) were noted growing adjacent to ponds 20, 22 and 23 south of OB3.

7.10.2 Buddleia is not included as an invasive species under the Wildlife and Countryside Act 1981 (as amended) or the Injurious Weeds Act 1959 but is however listed as an invasive species by DEFRA and the GB Non-native Species Secretariat.

7.11 Summary evaluation of ecological baseline

7.11.1 Assessing the ecological impacts of the Scheme by considering every species and habitat which could potentially be affected is impractical. Instead, the focus should be on 'Valued Ecological Receptors' (VERs), selected based on criteria such as legal protection, designation, rarity, and the degree to which they may be significantly impacted by the Scheme. Species and habitats which, according to baseline findings, are widespread, not threatened, resilient to the Scheme's effects, and expected to remain viable and sustainable have been excluded from the assessment. A summary of VERs identified and included within the assessment, and the justification for this is provided in **Table 10**.

Table 10: Summary of Valuable Ecological Receptors (VERs)

VER	Value	Justification
Non-statutory Designated Sites – Wildlife Sites		
Merthyr Common Central SINC	Local	Outside the redline boundary but is bounded by the site to the north and south. Derelict buildings in this area are known to support roosting barn owls. Ponds within this area are known to support Great Crested Newts and Southern marsh orchids (<i>Dactylorhiza praetermissa</i>) grow within marshy areas. There would be no direct effects upon this habitat from the restoration proposals, the site has been included mainly as it forms a direct link between OB2 and OB3 and plays a key functional role in the landscape as a ‘stepping stone’.
Priority Habitats		
Running water	Local	The site is drained by a network of surface water drainage ditches which feed the main arterial watercourses Bargoed Taf, Nant Cwm Blacs, Nant Morlais and Nant Carno. Within this drainage system are several existing ponds.
Ponds - Standing water	Local	eDNA from 17 of the 30 ponds sampled during 2024 were positive for GCN and could therefore be considered as a Priority Habitat ³⁷ . Several ponds also have Southern marsh orchids (<i>Dactylorhiza praetermissa</i>) growing around the margins.
Acid flush	Local	Important habitat adjacent to Bargoed Taf and numerous other lower order watercourses/streams traverse the site with similar future potential.
Species (Fauna)		
Great Crested Newt	Regional – Medium	eDNA results indicating positive presence of GCN in 17 out of the 30 ponds sampled during 2024, including within the redline boundary and CES.
Other amphibians	Local	Suitable breeding habitat within the site. Sub-optimal habitat for dispersal, foraging and refugia. Common frog noted during survey.
Bats	Local	Negligible suitable foraging and community habitat within the redline boundary. No trees would be impacted which have the potential to support bat roosts. Buildings have negligible to moderate potential to support bats. Suitable habitat within the CES. There is limited connectivity to the SAC which has lesser horseshoe bats are a feature of interest. The site lies to the north of the Heads of the Valley road.
Birds	Local	A male peregrine falcon was observed flying across the northern and south-eastern faces of the opencast void and a female, guarding a kill on top of OB1. A pair of barn owls (<i>Tyto alba</i>) were observed roosting in a derelict building within

³⁷ [Ponds \(UK BAP Priority Habitat description\) \(jncc.gov.uk\)](https://jncc.gov.uk/priority-habitats/)

VER	Value	Justification
		the Merthyr Common Central SINC. Both species are listed on Schedule 1 of the WCA 1981.
Otter	Local	Otters have been previously noted (from desk study data) to the south of the site. As the species has been recorded in the river catchment, travel routes could theoretically include animals wandering up into the site when crossing between watercourses.

7.11.2 Where a species or habitat has been ‘scoped out’ consideration will still be given to safeguarding biodiversity in general in order to comply with relevant plans, policies and initiatives. For example, all habitats listed in **Table 8** which are not Priority habitats, but are of local importance, flora, badgers, reptiles, invertebrates and hedgehogs are not considered to be VERs but are considered important in terms of their biodiversity value and so general mitigation measures are recommended in **Section 9**.



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8 DESCRIPTION OF PROPOSED WORKS

8.1 Final restoration proposals and objectives

8.1.1 In the context of the final restoration project, this EclA provides a structured framework to assess each phase of the restoration process, from initial interventions to long-term outcomes.

8.1.2 The scheme objectives were established early on in formulating the final restoration proposals and are outlined below having been developed in collaboration with Merthyr (South Wales) Ltd and Merthyr Tydfil County Borough Council. The scheme objectives were to: -

- Develop a restoration strategy to leave the site as a safe environment for future generations.
- Implement a progressive, cost effective, achievable and sustainable restoration scheme by 2025/2026 followed by a 5-year period of aftercare.
- Deliver community benefits on site for the local communities of Merthyr Tydfil and Caerphilly CBC as agreed with MTCBC.
- Align with the Environment (Wales) Act 2016 and the principles of DECCA (Diversity, Extent, Condition, Connectivity and Aspects of ecosystem resilience) and the Step Wise Approach.
- Create a framework for a diverse landscape and a range of habitats that encourage long term net biodiversity benefit (NBB).

8.1.3 While one of the main objectives is to enhance ecological quality, certain stages of restoration, such as earth-moving, regrading, hydrological works, landscaping and demolition can temporarily disturb habitats, displace wildlife, or alter hydrology, potentially having negative impacts on the existing baseline conditions.



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- 8.1.4 By assessing these stages individually, the EclA helps identify potential short-term or long term impacts, either positive or negative and allows to consider avoiding loss or damage to biodiversity, minimise the negative impacts, and where after measures to minimise impact, biodiversity and ecosystems could still be damaged, to mitigate that damage. This phased assessment enables a comprehensive understanding of both the immediate and lasting impacts of each activity, guiding adaptive management throughout the restoration process and maximising the ecological benefits over time.

8.2 Restoration Phase (Earthworks)

- 8.2.1 The final restoration strategy and sequence of works are set out on in **Appendix K; Figure 9**. It should be noted that there are three phases. Phases 1, Phase 2A, Phase 2B and this current Phase, Phase 3.
- 8.2.2 Phase 1 (62 hectares) was completed circa 2015 has now been reclaimed and the restoration of Phase 2A (circa 54 hectares) commenced in June 2024 and should be completed in 2024/2025 subject to weather conditions and other factors with Phase 2B to follow. Phases 1, 2A and 2B fall within the existing permission.
- 8.2.3 Phase 3 includes the void and OB1, OB2 and OB3 and is part of the final restoration that does not fall within the parameters of the consented scheme and hence needs a new planning application and an EIA and is the focus of this EclA.
- 8.2.4 The current proposals (Phase 3) are to selectively reduce the height of OB1 and re-profile the upper reaches. Much of the exposed sections of sidewalls above the main void would be retained and some local stabilisation works undertaken if required for geotechnical or health and safety reasons.
- 8.2.5 The slopes leading down to the base of the void below the sidewalls (to the east and south) and on the current western backfill slope would be re-profiled in accordance with geotechnical recommendations and are likely to be formed from loose tipped or dozed material (i.e. pushed using large earthmoving bulldozers).

- 8.2.6 On the steeper and north facing slopes, the intention would be to plant these slopes with mixed woodland. The less steep slopes on the western side of the void and elsewhere would be returned (subject to further geotechnical assessment) to rough grazing and pasture i.e., Common.
- 8.2.7 Some of these works on the upper part of the backfill slopes are currently the subject of interim restoration proposals referred to as Phases 2A and 2B. Some of the existing haul road routes would be retained as narrow plateaus and grassed tracks for future access and public amenity. Existing buildings would need to be demolished.
- 8.2.8 Many restoration schemes in South Wales, have seen the total removal of colliery spoil as part of the reclamation process. This is seen by some bodies as a missed opportunity to preserve some legacy features and to allow the natural regeneration of old spoil tips for biodiversity benefit.
- 8.2.9 The Ffos-y-Fran final reclamation scheme will retain some areas of existing overburden and spoil to allow what can be a unique habitat to form naturally. These areas, free from human intervention and protected from grazing livestock will be left to develop naturally on nutrient poor material. It is hoped that these areas will, over time, see a diverse and complex range of flower rich grasslands develop to attract pollinating insects such as butterflies, moths and beetles.

8.3 Timescales

- 8.3.1 The final restoration strategy would be implemented as a series of works packages over a period of approximately 2-3 years and be funded by the proceeds held in the ESCROW account.
- 8.3.2 A 2028 timetable is aimed for completion of the restoration measures and the corresponding 'aftercare' stage, will include an additional five-year period. The current ES project therefore comprises two different 'temporal' elements; 2028



marks the transition from the restoration ‘works’ phase for the site to the permanent ‘aftercare’ phase.

8.4 Habitat creation

8.4.1 The aim of the landscape restoration is to retain and protect those habitats already established or becoming established and already exhibiting good quality habitat, for example areas of acid grassland, habitat mosaics, the central ecological area, ponds and watercourses. Full details of the landscape proposals are set out within a separate Landscape and Visual Appraisal Report (LVIA). In summary, the areas subject to this EclA would include the following habitat creation:

- Mixed woodland
- Permanent waterbody
- Retained exposed rock
- Heathland
- Shrub, and
- Acid grassland.

8.4.2 There is also the potential to enhance existing ponds for biodiversity.

8.5 Aftercare and monitoring

8.5.1 Once completed, the restored landform site would be subject to a five-year establishment maintenance period as set out within a Habitat Management Plan to enable grass seeding and tree planting to establish before returning the site to urban common for grazing and public amenity.

9 POTENTIAL IMPACTS AND MITIGATION MEASURES

9.1 Background

9.1.1 In accordance with current CIEEM guidelines, only impacts that are likely to be significant need to be examined in detail. Impacts that are unlikely to occur, or that would likely be insignificant if they did occur, can be excluded from the assessment.

9.1.2 Where uncertainty exists, it is prudent to assess the potential impact to ensure thoroughness and that has typically been the case here. Furthermore, the EclA need only evaluate and report significant residual effects that remain after implementing mitigation measures. However, it is considered best practice to transparently present both the initial potential significant effects before mitigation and the remaining significant effects after mitigation has been applied. This approach ensures that the full impact of the restoration of the site is clear, while focusing on the most relevant outcomes.

9.1.3 Potential effects which could arise from the restoration include the following:

- Direct mortality and disturbance to protected and notable species;
- Direct loss of and disturbance to habitats; and,
- Noise, disturbance, and risk of pollution during restoration.

9.1.4 This section aims to evaluate the potential impacts of the proposed restoration on significant ecological features, or "valuable receptors," highlighted as important in the baseline conditions.

9.1.5 Each valuable receptor will be considered, along with the impacts of the restoration which could potentially have significant impacts on them. For each receptor, this is followed by a description of the mitigation measures which are known to be included in the restoration strategy and at which level of the mitigation hierarchy they exist.



9.2 Mitigation hierarchy

9.2.1 The approach to mitigation is based on a hierarchy and step wise approach which places avoidance of significant impacts as the most preferable, while compensation, which is in some circumstances, the least effective and least preferable option to compensate for losses. In between these are minimise and mitigate/restore. With regards to this scheme, the objective is to restore the site and avoid/retain/enhance/protect areas which already have a biodiversity value.

9.3 General avoidance

9.3.1 Sequencing of proposed restoration would be carried out to avoid areas of important habitat to minimise loss. Where necessary, appropriate barriers would be installed to protect biodiversity assets.

9.3.2 Best practice guidelines would be followed to avoid impacts from dust, wastewater, contaminated site drainage, chemical and reagent spillage, noise, vibration, and nighttime light spillage on the surrounding environment. These would be detailed in the Long-term Management Plan.

9.4 Minimise and mitigate

9.4.1 Any negative effects would be minimised through mitigation measures, either through the design and timing of the restoration works or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

9.4.2 Mitigation measures would be proportional to the potential effect. Any significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against legislation, policy, and development management in determining the proposed restoration strategy. Mitigation measures include but are not limited to the following:

- Earth and spoil moving avoids completely the loss of semi-mature trees.



- If any future restoration works, including landscaping are located near mature or semi mature trees this would be conducted following best practice guidance BS 5837:2012 *Trees in relation to design, demolition, and construction*. This includes the requirement for a buffer zone established around the retained trees during construction to avoid unnecessary compaction within the Root Protection Zone.
- Works in or near standing water would follow the guidance as set out within *Guidance for Pollution Prevention (GPP5) – Works and maintenance near water*³⁸.
- Current safeguards in place to prevent pollutant ingress to the SINC and local watercourses would be maintained during the restoration works.
- The contractor would provide a Construction Environmental Management Plan (CEMP)
- Planting design which allows movement of species, i.e. linear habitats including shrub and tree planting which provide cover and shelter
- Sensitive design of lighting, if lighting is required
- The use silenced and well-maintained plant conforming with the relevant directives relating to noise and vibration
- Toolbox talks to contractors
- Pre-commencement site walkovers and surveys

³⁸ https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm_source=website&utm_medium=social&utm_campaign=GPP5%2027112017

9.5 Restoration and enhancement

- 9.5.1 The proposed restoration would provide net benefits for biodiversity. This would link to the economic, social, environmental, and cultural well-being improvements which could be achieved, as set out in The Well-being of Future Generations (Wales) Act 2015.
- 9.5.2 Habitat Management plans would be produced which would protect the important existing habitats and species on site, as well introducing new habitats, appropriate to the site's conditions, and enhancing existing habitats. This would include the protection, creation and/or enhancement, of acid grassland, exposed cliff faces, wetlands, ponds, heathland, and open mosaics on mineral spoil.
- 9.5.3 In addition, Restoration and aftercare schemes would be produced, similar to that produced for Phase 2A³⁹.

9.6 Compensation

- 9.6.1 It is unlikely that there would be significant residual negative ecological effects, where avoidance, mitigation and restoration measures are considered. Compensatory measures would be a last resort and are unlikely to be required to compensate for habitats lost/disturbed during the restoration, as one of the objectives of the restoration is to create, restore and retain habitats.

9.7 Working methods

- 9.7.1 The above mitigation approaches would be further supplemented by the incorporation of guidance given to those who will conduct the work.
- 9.7.2 A Precautionary Works Method Statement (PWMS) would be produced. This document would outline specific, pre-planned procedures to avoid and reduce harm

³⁹ Stoddard, J. (March 2024) FFOS-Y-FRAN RESTORATION STRATEGY · Phase 2A Restoration and Aftercare Scheme. RML for Merthyr South Wales Ltd.

to wildlife, habitats, and protected species. The statements would inform the CEMP and ensure that all activities are conducted in an environmentally responsible manner and in compliance with ecological regulations.

- 9.7.3 Toolbox Talks (TBTs) complement PWMS by delivering brief, focused training sessions to on-site workers, raising awareness of specific ecological considerations and providing practical steps to protect wildlife. TBTs ensure that workers are informed about the species present, the sensitivity of their habitats, and the appropriate actions to avoid harm. For instance, during nesting bird season, a TBT might highlight the need to avoid disturbing active nests and include steps for identifying nests or ceasing work if one is found. Together, PWMS and TBTs help ensure that project activities are conducted with care, reducing the risk of harm to protected species and minimising the project's ecological impact.



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10 POTENTIAL IMPACTS AND MITIGATION MEASURES BY RECEPTOR

10.1 Non-Statutory Designated Sites

Merthyr Common Central SINC

Potential Impacts:

- 10.1.1 Of the Sites of Importance for Nature Conservation within 2 km of the redline boundary only the Merthyr Common Central SINC has the potential to be impacted by the proposed restoration as it borders the site to the north, south and west (**Appendix H; Figure 6**). However, significant earthworks will only be taking place in the area of OB1, bordering the SINC at its northwest corner (**Appendix K; Figure 9**). The remaining adjacent operations will be planting and re-seeding which are considered to be of ‘neutral’ impact.
- 10.1.2 There are no plans for the addition or removal of specific drainage systems which would or do feed the SINC and as such there are not expected to be any significant changes to water levels from the baseline conditions.
- 10.1.3 The greatest potential impact is therefore likely to be as a result of run-off from earthworks entering those waterbodies which drain into the SINC.
- 10.1.4 The area has established and continued to support protected species, such as great crested newts and barn owls, throughout the period when mining operations were underway. As such, the comparative impact of restoration works is likely to be ‘neutral’. Impacts on these species are considered separately (**section 10.3**).

Mitigate

- 10.1.5 What risk may be posed to the SINC from run-off can largely be mitigated through the establishment of physical barriers, such as silt fences, at strategic points around the working area to capture sediment before it enters channels which feed the SINC. A phased approach to earthworks, disturbing only one section of land at a time, would reduce the amount of exposed soil vulnerable to erosion and run-off.



- 10.1.6 The SINC itself is outside of the proposed restoration area and will therefore not experience any direct enhancements. However, as discussed in **Section 8.4** and **Section 10.2**, the creation of new habitat in the immediate surrounding area is likely to be beneficial to species using the SINC, and aid access to it by those which currently do not.
- 10.1.7 In its baseline condition the SINC is a habitat of relatively high quality, isolated by the previously degraded landscape. Such enhanced connectivity would allow wildlife to move more freely between habitats, increasing access to resources like food, water, and breeding sites. This movement is especially important for migratory species, as well as for species with large territories or specific habitat needs that may not all be met within a single site. By connecting fragmented habitats, genetic diversity is promoted as animals are able to find mates from different populations, reducing inbreeding and strengthening population resilience.
- 10.1.8 Additionally, improved connectivity supports species' adaptation to environmental changes, such as shifting climate conditions. As habitats change, connected landscapes provide routes for animals to migrate to more suitable environments. This is particularly valuable for species in isolated or degraded habitats, where limited connectivity could otherwise trap them in less favourable conditions.
- 10.1.9 As such, the incorporated enhancements of the surrounding habitat would be of overall benefit to the long-term management objectives of the SINC⁴⁰, specifically relating to maintaining enhancing and creating habitats of value to protected notable species utilising the site, including bats, birds, reptiles and amphibians.

⁴⁰ Miller Argent (South Wales) Limited. Ffos y fran Land Reclamation Scheme - Central Ecological Area Management Plan 2009 – 2024. Agreed between Merthyr Tydfil County Borough Council and Miller Argent (South Wales) Limited Version 1 November 2009.

10.2 Habitats

Ponds

Potential impacts

- 10.2.1 The potential impacts to ponds from the restoration proposals are very similar to those which might be experienced by amphibians (refer to **Section 10.3**).
- 10.2.2 One pond, pond 8 (**Appendix C; Figure 3**) will be directly impacted by the proposal. This pond is encompassed by the area to the eastern edge of the void (**Appendix L; Figure 10**) which is designated for reprofiling and as such is expected to be lost.
- 10.2.3 Pond 8 is currently of negligible ecological value, evidenced by a HSI score of 0.30 and absence of GCN eDNA (**Appendix D; Table 4**). The surrounding vegetation is sparse, consisting almost entirely of coltsfoot (*Tussilago farfara*), a pioneer plant capable of growing on very alkaline soils and often found on former open-cast mining sites⁴¹. No aquatic vegetation was observed, and it seems unlikely that it is currently capable of supporting much aquatic life.
- 10.2.4 Though pond 8 will be removed, in its current state it offers very limited value to biodiversity across the site. If left *in situ* for a long enough period of time, this pond may naturally regenerate as others across the site have done, to a state in which its loss is of greater significance. However, its removal is to be undertaken prior to a point at which this would be possible and therefore the impact is considered ‘neutral’
- 10.2.5 The remaining ponds will not be directly negatively impacted as the proposed restoration will leave these areas to continue natural regeneration, a positive effect.
- 10.2.6 Those remaining ponds closest to the majority of the earthworks will remain fenced-off from the works and this is expected to provide a sufficient buffer to any potential

⁴¹ Graeme Toby, Denham, A. and Whitelegg, M. (2011). *The Western herbal tradition : 2000 years of medicinal plant knowledge*. Edinburgh: Elsevier, pp317.

pollution events resulting from machinery or run-off from dust-suppression water spraying.

- 10.2.7 Dust arising during land-forming could potentially have a 'slight' impact on ponds within 250m of these works, without mitigation and if occurring to a significant degree. When dust settles on a pond's surface, it can reduce penetration of the light essential for photosynthesis in aquatic plants and algae. This reduced light can disrupt the pond's food web, affecting organisms that rely on these primary producers. Dust can also introduce fine particles that settle on the pond bed, altering sediment composition, and potentially suffocating invertebrates and larval stages of amphibians. Additionally, dust can carry pollutants like metals or chemicals, which may accumulate in the water, leading to toxicity for sensitive aquatic species.

Mitigation and enhancement

- 10.2.8 Dust suppression procedures will be in place during earthmoving operations, these include:
- Not conducting earthworks during excessively windy and/or dry conditions.
 - Reduced vehicle speeds to minimise dust kicked up.
 - Spraying of water to bind particles and prevent them becoming airborne.
- 10.2.9 It is expected that adherence to these procedures can mitigate risk to ponds resulting from dust.
- 10.2.10 More broadly, the proposed planting and re-seeding is likely to significantly improve soil stability across the site. This is expected to decrease longer-term pond contamination caused by run-off, dust or erosion/collapse of edges.
- 10.2.11 As discussed in **Section 10.3**, enhancements of ponds with exposed lining will be undertaken via the laying of coir matting. This is expected to improve the ecological value of these ponds by providing a more natural, vegetated margin allowing a range of species to more safely transition between land and water.

- 10.2.12 With the exception of improvements to the margins where exposed lining is visible, further interventions to the immediate area of the ponds are likely to be unnecessary. As has already been observed in a number of ponds across the site (**Appendix D; Table 4** and **Appendix C; Figure 3**), with the passage of sufficient time from their operational use, natural regeneration is expected to lead to significant enhancement in ecological value.
- 10.2.13 The succession process begins when pioneer species such as algae and hardy aquatic plants colonise the pond, providing habitat and food for insects and other small organisms. As these organisms decompose, they enrich the pond's sediment, creating a nutrient base that supports more complex plant and animal species. Over time, natural filtration by plants such as cattails, reeds, and other wetland vegetation helps to clean the water by absorbing excess nutrients and trapping sediments. Additionally, as water quality improves, species such as amphibians return, further contributing to a balanced ecosystem. Seasonal cycles also play a role, as rain and wind can help oxygenate the water, disperse seeds, and introduce new species from surrounding habitats, leading to gradual but effective regeneration of the pond without intervention.
- 10.2.14 Planting and seeding of the wider habitat surrounding the ponds is also expected to be of direct benefit in the medium to long-term. Trees and grasses act as natural buffers, helping to prevent soil erosion and reduce the amount of sediment, nutrients, and pollutants that flow into the pond from surrounding land. This helps maintain clear water, limits algal blooms, and prevents oxygen depletion, which is essential for supporting diverse aquatic life.
- 10.2.15 Woodland trees around the ponds offer shaded areas, moderating water temperature and reducing excessive evaporation in hot weather. Cooler water temperatures are beneficial for many aquatic species, such as amphibians, which rely on stable conditions to thrive. The fallen leaves and organic debris from trees will also

aid in the creation of microhabitats and nutrient sources within the pond, further supporting insects, microorganisms, and other species that form the foundation of the food web.

10.2.16 Grass cover also plays a key role in promoting beneficial insect populations. Native grasses and flowering plants attract pollinators and other insects, which, in turn, provide food for birds and amphibians, creating a more integrated and complex ecosystem. Together, woodland trees and grass seeding will enhance the pond's resilience by improving water quality, increasing biodiversity, and stabilising the landscape, leading to a healthier, self-sustaining ecosystem that supports a wide array of plant and animal species.

10.2.17 It is expected that creation of a large new body of standing water within the void, enhancement of the margins of some of the retained ponds and planting across the wider surrounding habitat would provide a significant net benefit for biodiversity above baseline conditions beginning in the short-term and increasing in value with time.

Running water

Impacts

10.2.18 This habitat is primarily associated with the stream 'Bargoed Taf' running along the west and south of OB3.

10.2.19 The activity of machines disturbing soils during land reclamation and reprofiling works on and around the site could increase the amount of fine sediments entering the flow and settling into the streambed of nearby ditches and streams causing pollution effects and smothering. The use of heavy machinery on site could also result in the spillage of toxic fuels and oils etc. into adjacent watercourses.

10.2.20 The Water Framework Compliance Directive Report⁴² found that there could be a potential short-term increase in sediment supply during construction, but long-term improvements are expected due to reduced sediment transfer. Construction activities may temporarily affect aquatic habitats, but overall biodiversity is expected to improve post-restoration.

Mitigation and enhancement

10.2.21 Mitigation measures would include the following:

- Retention of water treatment areas (sediment settlement lagoons) which will ensure any flows impacted by construction activities are treated (for sediment removal) before leaving site. This mitigates the potential effects on downstream WFD waterbodies.
- Pollution control and containment measures to limit the spread of pollution and reduce the risk of harm to biodiversity in the case of accidents which could result in spillages of pollutants such as fuels or silt.
- Works within and adjacent to the watercourse would be monitored by an Environmental Clerk of Works (ECOW). If discolouration of the watercourse is noted, works would stop and working practices reviewed.
- Silt would be managed by the use of cut-off drains, silt curtains, straw bales as necessary, placed downstream of the reprofiling works or works within existing watercourses to minimise transfer of any excess sediments downstream.
- All fuel, oil and chemicals used on site would be stored away in a locked store which would be bunded to 110% capacity of the volume stored.

⁴² Williams, M (28/11/2024) Ffos-y-Fran, Merthyr Tydfil Baseline and Preliminary WFD Compliance Assessment for Merthyr (South Wales) Ltd. Waterco report number 15840-WFD-01.

Acid flush

Potential impacts

- 10.2.22 This habitat occurs in small patches in a number of locations across the site. In terms of proximity to areas where the most significant works will occur, only the patch toward the northern boundary at the base of OB1 has any potential to be impacted (**Appendix K; Figure 9**). Works in close proximity to this area includes cutting of existing material to fill and reprofile the void. The direction of works would be away from this habitat.
- 10.2.23 Acid flush wetlands are typically nutrient-poor environments that support specialised plants and animals adapted to acidic, low-nutrient, and low-pH conditions. Without mitigation, runoff from disturbed soils during re-grading of the eastern slope of OB1 could carry sediments, nutrients, and potentially alter pH levels, which could disrupt the delicate balance of this habitat.
- 10.2.24 As with previously considered receptors, this habitat has persisted over the period of active mining operations, where impacts were far more severe. As such, it seems unlikely that impacts from the comparatively minimal and short-term restoration works around OB1 would be of significant detriment. The impact is therefore considered to be ‘slight’.

Mitigation and enhancement

- 10.2.25 Much of the impact to this habitat could be mitigated by the installation of silt fencing or other appropriate measures at the base of OB1, which would be in close proximity to this habitat and associated watercourse.
- 10.2.26 Tree and or shrub planting around the area can create a buffer zone, intercepting any pollutants and windblown dust, thereby reducing nutrient and sediment deposition into the wetland, which is crucial for maintaining its naturally low-nutrient, acidic conditions. This vegetation strip would also offer habitat for birds and insects that

may support the ecological diversity of the surrounding area, indirectly benefiting species in the wetland by stabilising nearby ecosystems.

- 10.2.27 Grass seeding, where appropriate, in the area adjacent to the wetland will help prevent soil erosion and sediment runoff into the wetland, maintaining the delicate soil and water balance essential to acid flush habitats. Grasses contribute to soil stability, limiting disturbance that could alter the acidity and composition of the wetland substrate.
- 10.2.28 The inclusion of a nearby permanent freshwater body in the void provides an alternative habitat for water-dependent species, reducing potential pressures on the wetland and allowing it to remain a specialised habitat.

10.3 Species

Amphibians –including great crested newts

Potential impacts

- 10.3.1 Pond 8 will be removed as part of the re-profiling undertaken around the void (**Appendix L; Figure 10**). This pond was formed as a bucket-wash and was, until the cessation of mining, used as such. It has minimal value to amphibians, as indicated by a low HSI score of 0.30 and the absence of Great Crested Newt (GCN) eDNA (**Appendix C; Figure 3** and **Appendix D; Table 4**). The surrounding vegetation is very sparse and is dominated almost entirely by the pioneer species coltsfoot.
- 10.3.2 The other ponds in close proximity to the main earthworks around the void (ponds 1 and 6), and at most risk of impact (**Appendix L; Figure 10**), also gave negative eDNA results for GCN and had poor or below average HSI scores indicating low amphibian suitability (**Appendix C; Figure 3** and **Appendix D; Table 4**).
- 10.3.3 In its baseline condition, the vast majority of habitat subject to earthworks/re-profiling exists as mine and associated spoil (**Appendix K; Figure 9**). This habitat typically consists of loose, rocky, and nutrient-poor ground that lacks the water-

retaining capacity essential for amphibians, which rely on moist environments to prevent desiccation. Additionally, mine spoils rarely support the dense vegetation or organic matter needed to create shaded, cool microhabitats and shelter from predators, or to support the invertebrate food sources amphibians rely on. The lack of suitable breeding sites, such as ponds or pools with clean water, further makes these areas inhospitable. Therefore, destruction of viable amphibian habitat is not anticipated at any point in the restoration proposal. Those ponds identified as positive for GCN would be retained and protected, and where required, enhanced.

- 10.3.4 While the areas subject to earthworks and associated machinery traffic appear similarly unsuitable for migration and dispersal within the wider landscape, direct mortality to any individual amphibians found in these habitats cannot be entirely ruled out. This is considered to represent a 'slight' and short-term impact during the land-forming phase.
- 10.3.5 Dust arising during land-forming could represent a 'slight' impact on amphibian habitats within 250m, without mitigation, and if occurring to a significant degree. For example, dust settling on water can change pH, increase turbidity, and introduce pollutants, reducing water quality and disrupting processes like respiration, feeding, and breeding. Increased turbidity limits sunlight, affecting plant growth and lowering oxygen levels, which amphibians and other pond organisms rely on.
- 10.3.6 Amphibian habitat is not expected to be at risk from any pollution events potentially arising from equipment (e.g. oil, hydraulic fluid) during any stage of the proposal. All ponds within the ZOI are fenced off from the works and have sufficient buffer areas to prevent direct contamination.
- 10.3.7 Removal of temporary structures associated with the previous mining works (e.g. workshops and heavy plant storage units) will take place approximately 30m north of the eDNA positive pond 9 (**Appendix C; Figure 3**). These structures are open corrugated metal sheds, built on bare ground. The same bare ground also lies

between this area and pond 9. As a result of the unsuitability of the connecting/surrounding habitat in the direction of the works, and of the structures themselves as refuges, it seems highly unlikely that amphibians would be encountered or disturbed during the removal works and therefore represents a 'neutral' risk.

- 10.3.8 Merthyr Common Central SINC likely represents the most suitable terrestrial amphibian habitat within the ZOI and would be unaffected by the proposals. It is located outside of the redline boundary and is sufficiently far from earthworks to be impacted. This area is considered in **Section 10.1**.

Mitigation and enhancement

- 10.3.9 Due to the adoption of an avoidance and enhancement approach with regards to amphibian habitats within the zone of influence, risks are expected to be 'neutral' and the restoration proposals would improve the condition above baseline for amphibians.
- 10.3.10 Any approach which would seek to restore the site to a state representing conditions prior to any mining works would risk serious disruption to amphibians which have since colonised the numerous ponds which arose as a result of the sites historic use. The baseline is now established as one including 30 ponds, more than half of which are eDNA positive from GCN. As such, baseline habitat of most value to amphibians has been excluded from proposals, with the exception of enhancement measures.
- 10.3.11 Many of the ponds within the ZOI have shown considerable natural regeneration and now represent habitat of high quality for amphibians, including priority species such as GCN. For this reason, it is felt that enhancement measures should be limited to avoid unintentionally disrupting this process.
- 10.3.12 Several of the lined ponds were also found to be positive for GCN (**Appendix D; Table 4 – Ponds 3, 9, 27 and 28**). In certain instances, the lining is exposed around the edges

and this is likely to represent an opportunity to further enhance these areas for amphibians. Such exposed lining could make access and egress more challenging for amphibians, as well as other species which, in the case of large mammals, may become trapped and drown without the ability to gain purchase. As the lining itself cannot be removed without risk of destroying these ponds, the proposal for enhancement is to cover the exposed sections with coir-type matting. The matting promotes a stable medium for the growth of native plants, offering further shelter and providing a more natural transition between the pond and surrounding habitat. This is especially important as, while GCN may disperse up to 1km from their resident ponds⁴³, a proportion of adult and immature great crested newts are more likely to over-winter in or close to the pond edge at sites with dense pond edge vegetation⁴⁴.

10.3.13 Risk of direct mortality to amphibians during the land-forming phase, or removal of structures, is 'slight' and could be mitigated to 'neutral' through the incorporation of 'ToolBox Talks' (TBT) given to operatives. This information would inform those involved of how to identify relevant species and the procedure to follow should they suspect that an amphibian has been discovered and/or may be at risk.

10.3.14 The impact to amphibian habitats from dust generated by the works is considered to be 'slight'. Dust suppression procedures will be in place during earthmoving operations, these include:

- Not conducting earthworks during excessively windy and/or dry conditions.
- Reduced vehicle speeds to minimise dust kicked up.
- Spraying of water to bind particles and prevent them becoming airborne.

⁴³ <https://naturalresources.wales/media/679463/great-crested-newts-guidance-for-glastir-woodland-creation.pdf>

⁴⁴ Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

- 10.3.15 It is expected that adherence to these procedures can mitigate to ‘neutral’ the impact to amphibian habitat resulting from dust.
- 10.3.16 Amphibian habitat connectivity is expected to improve significantly above baseline conditions as large areas of OB1 currently consisting of bare ground and mine spoil will be returned to acid grassland. This would provide cover and aid the movement of amphibians between ponds. As a result of this improved connectivity it seems likely that ponds which are currently eDNA negative for GCN (e.g. **1**, **6** and **8**; **Appendix D; Table 4**) could become colonised over time.
- 10.3.17 Enhancement for amphibians will also include the creation of a large permanent waterbody where the void is currently situated. The waterbody, in combination with the surrounding mixed woodland planting, has the potential to be of benefit to a number of breeding, hibernating and foraging amphibian species. In its baseline condition this area is of no benefit to amphibian species as it consists of un-vegetated mine workings/spoil with a small area of groundwater.
- 10.3.18 Further amphibian enhancements will occur on the base of OB2. Vegetation is already re-establishing in this area and the seasonal pond 13 (**Appendix C; Figure 3** and **Appendix D; Table 4**), while eDNA negative and of a relatively low HSI score, does have marginal vegetation establishing in the form of *Juncus*. Proposed enhancements include increasing the suitability of this area as wetland habitat through the incorporation of additional earth ‘scrapes’ which can retain water and support aquatic vegetation. Broadleaved woodland planting along the eastern side of OB2 is also likely to increase the connectivity and favourability of this area for amphibians.
- 10.3.19 New planting around the SINC would also enhance connectivity to/from this area, this is considered further in **Section 10.1**.

10.3.20 While pollution incidents arising from machinery are not expected to pose a significant risk to amphibian habitats, work would follow pollution prevention guidance for works near water⁴⁵.

10.3.21 Where a scheme might impact on GCN, the concept of Favourable Conservation Status (FCS) is central to decision-making. Favourable Conservation Status is a concept at the heart of conservation action and policy and is a recognised and adopted approach utilised by NRW. The conservation status of species will be taken as 'favourable' when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

10.3.22 Evidence suggests, from previous surveys conducted⁴⁶, that irrespective of previous mining activities at the site, the occurrence of GCN ponds has increased. With the current restoration proposals to include the retention and enhancement of ponds and adjacent terrestrial habitat, the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. There will continue to be a sufficiently large habitat to maintain the populations on a long-term basis, and the future prospect of the species look to be positive, and the FCS favourable.

Birds

⁴⁵ <https://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf>

⁴⁶ Leek and Weston Ltd (May 2003) Ffos Y Fran Land Reclamation Scheme Incorporating Extraction of Coal by Opencast Methods Being the Final Phase of the East Merthyr Reclamation Scheme. Environmental Statement. For Miller Argent.

Potential impact

- 10.3.23 The northeastern benches of the opencast void are currently being used by several species of gulls, corvids, and feral pigeons, likely attracted to the area by the nearby Trecatti Landfill Site. As a result of the prevalence of such prey, individuals of the Schedule 1 species peregrine falcon have been observed hunting and feeding in this location, though there is currently no evidence of nesting. Without mitigation there exists the potential for 'slight' impacts on such bird species using the area around the void during re-profiling operations.
- 10.3.24 A pair of nesting barn owls are known to utilise one of the derelict buildings at the eastern end of the SINC. This area is outside of the reline boundary and as such no works will take place in this area, with the main restoration works taking place approximately 400m northwest at the nearest point. There exists minimal likelihood of noise-related disturbance as this species began utilising the area at a time when mining operations were still underway, and noise/vibration levels were significantly higher than is expect for the final restoration. This area is also approximately 30m from relatively busy road and therefore has experienced a degree of disruption from traffic for a significant period of time. Additionally, no works will take place at night when these birds hunt.
- 10.3.25 Risk to breeding barn owls is considered to be 'neutral' and will likely ultimately become beneficial in the long term as new planting expands hunting grounds and connectivity.
- 10.3.26 No permanent loss of breeding bird habitat is expected to result from the proposed restoration strategy as the most potentially disruptive operations (e.g. earth moving) will be restricted to areas of mine and mine spoil which, at baseline condition, have little to no value.

10.3.27 There exists a potential ‘neutral or slight’ risk of disturbance to birds during planting and re-seeding operations. This would primarily impact ground-nesting species, were they to be present.

10.3.28 In the absence of mitigation, dust would have the potential to result in a ‘slight’ impact to bird species. Dust generated by earth-moving operations can settle on vegetation and in water, reducing food quality and contaminating drinking water for birds. Dust can also impair the respiratory health of birds, particularly species that forage close to the ground.

Mitigation and enhancement

10.3.29 Risk to nesting birds can largely be mitigated to ‘neutral’ by conducting operations such as earth-moving and planting within areas which are suitable to support nesting birds, outside of the nesting bird season (considered to be March - August inclusive but can be earlier or later in the season dependent upon local climatic conditions). With the inclusion of dust suppression measures the impact to viable habitat would also be reduced to ‘neutral’.

10.3.30 While there is no evidence of peregrine falcons nesting on the site, they are known to use the benches around the void for hunting. The species is known to have a relatively high tolerance to human activity, including active quarries,⁴⁷ and its utilisation of this area began during a time when mining operations were underway. While they may not currently nest on the site, breeding birds may continue to use the area for hunting and feeding young, and, if works in the area reduce, they may start to nest. As a precautionary approach, it is advised that pre works check are conducted and if nesting behaviour is exhibited, then re-profiling works in that area would need to stop until young have fledge. Thus, conducting re-profiling of the void

⁴⁷ Wilson, M. W., Balmer, D. E., Jones, K., King, V. A., Raw, D., Rollie, C. J., ... Noble, D. G. (2018). The breeding population of Peregrine Falcon *Falco peregrinus* in the United Kingdom, Isle of Man and Channel Islands in 2014. *Bird Study*, 65(1), 1–19. <https://doi.org/10.1080/00063657.2017.1421610>

outside of the nesting season would mitigate to ‘neutral’ the potential impact from loss of hunting grounds during a period when they are most dependent.

- 10.3.31 The proposed restoration does not envisage any permanent loss of peregrine falcon habitat and is likely to result in enhancements over time. The works would involve retaining and stabilising the exposed rock face of the void and the addition of soil-forming material to the benches is expected to encourage colonisation by vegetation. With time it is quite possible that this area could succeed into classification as ‘Inland Rock and Scree’, a UK BAP habitat⁴⁸.
- 10.3.32 Broader enhancements for birds will involve habitat creation in the form of planting and re-seeding. Trees and shrubs of varying heights (e.g. oaks, birches, and hawthorns) included in the planting scheme, would mature to create layered habitats that support a range of bird species with different nesting preferences. Dense, understory vegetation offers safe nesting sites for ground-nesting and low-perching birds, while taller trees provide elevated nesting and lookout spots for predatory species.
- 10.3.33 Woodlands also attract insects, which are crucial food sources for many bird species, especially during breeding seasons when protein-rich food is needed for young birds. The inclusion of trees and shrubs which produce fruits, seeds, and nuts will result in important food sources throughout the year; for example, berry-producing shrubs like rowan and elder offer sustenance in colder months, helping birds survive through winter. Woodland planting also creates natural corridors that connect fragmented habitats, allowing birds to move safely between feeding, nesting, and roosting areas.
- 10.3.34 The creation of a new permanent waterbody in the current void location will provide substantial benefits to birds. Freshwater bodies attract a wide variety of species by offering essential resources, including drinking/cleaning water, food and shelter.

⁴⁸ <https://data.jncc.gov.uk/data/a81bf2a7-b637-4497-a8be-03bd50d4290d/UKBAP-BAPHabitats-19-InlandRockOutcrop.pdf>

Aquatic plants, insects, and amphibians would be expected to colonise the water, creating a diverse food web that, over time, could support insect-eating birds or amphibian-eaters like herons and wading birds.

10.3.35 Additionally, freshwater habitats provide crucial nesting opportunities for certain species. Ducks, swans, and other waterfowl may nest near the water's edge, while reeds and dense vegetation offer sheltered spots for songbirds and marsh-nesting species. Freshwater bodies are also valuable for migratory birds, serving as stopover points where they can rest and refuel during long journeys. Due to its size, this area can also be valuable as a consistent water source, making the area more resilient for birds during droughts or hot weather.

Bats

Potential impacts

10.3.36 Previous reports suggest that the Site has limited suitability to support bats, with the exception of occasional foraging in suitable conditions (**Section 4.1.; Table 2**). The 2022 Environmental Statement Addendum⁴⁹ did, however, suggest that the Bogey Road bridge/cutting as a potential roosting/hibernation site for Pipistrelle and Myotis.

10.3.37 The main potential impact to bats would be as a result of the loss of potential roosting habitat. However, the majority of structures considered to have low-moderate potential occur outside of the red line boundary and would not be demolished. With the exception of the Bogey Road bridge, structures within the red line boundary generally have negligible potential to support bats owing to their type of construction, as such, the loss of these is a 'neutral effect' to local bat populations.

⁴⁹ SLR (2022) S.73 Application to Vary Conditions 3 and 4. Environmental Addendum Chapter 15: Ecology.

10.3.38 In addition, the current restoration proposals do not result in the loss of any trees, or suitable foraging and commuting habitat. No impacts upon bats are envisaged.

Mitigation and enhancement

10.3.39 The bridge identified as a ‘potential’ roost location will be retained and no works are anticipated within 100m of this area.

10.3.40 If overnight working is required for the restoration proposals, it is likely that any lighting would be directed to where it is needed (i.e. re-profiling works) and would not impact upon any suitable bat habitat. Landscaping would be conducted within daylight hours and would not disturb bats.

10.3.41 It is anticipated that no lighting would be required post restoration.

10.3.42 The proposed habitat to be created would, once established, would support foraging and commuting habitat for local bat populations. With the proposed mitigation the long-term effect upon bat populations are considered to be beneficial with improved connectivity.

Otter

Potential Impacts

10.3.43 Otters have been previously noted (from desk study data) to the south of the site, though no physical evidence has been recorded in any of the reports reviewed (**Section 4.1; Table 2**).

10.3.44 While there is an absence of physical evidence, and reviewed reports are unanimous on the unsuitability of the habitat within the site, due to the presence of records indicating otters in the surrounding habitat and their status as a priority species, they have been considered as Valuable Ecological Receptors.

10.3.45 Watercourses to the south of OB3 would remain largely unaffected by the restoration proposals, as would waterbodies and associated drains with the central SINC.



10.3.46 No suitable habitat for commuting, foraging, resting up or breeding otters would be directly disturbed as result of the restoration proposals and all previous reports suggest that the Site is generally unsuitable even in the absence of such work (**Section 4.1.; Table 2**).

10.3.47 Potential indirect effects could include disturbance as a result of activity of machines disturbing soils on and around the Site, which could increase the amount of fine sediments entering the flow and settling into adjacent watercourses causing pollution effects and smothering potential prey and affecting the quality of the water of suitable habitat further downstream.

10.3.48 The use of heavy machinery on site could also result in the spillage of toxic fuels and oils etc. into adjacent watercourses/waterbodies the river, again having an indirect effect on water quality and prey abundance.

Mitigation and enhancement

10.3.49 Due to the lack of direct impact on suitable habitat, mitigation measures to prevent detrimental impact on otters would largely be the same as are proposed for running water (**Section 10.2, paragraph 10.2.21**). These will include:

- Retention of water treatment areas (sediment settlement lagoons) which will ensure any flows impacted by construction activities are treated (for sediment removal) before leaving site. This mitigates the potential effects on downstream WFD waterbodies.
- Pollution control and containment measures to limit the spread of pollution and reduce the risk of harm to biodiversity in the case of accidents which could result in spillages of pollutants such as fuels or silt.
- Works within and adjacent to the watercourse would be monitored by an Environmental Clerk of Works (ECOW). If discolouration of the watercourse is noted, works would stop and working practices reviewed.

- Silt would be managed by the use of cut-off drains, silt curtains, straw bales as necessary, placed downstream of the reprofiling works or works within existing watercourses to minimise transfer of any excess sediments downstream.
- All fuel, oil and chemicals used on site would be stored away in a locked store which would be bunded to 110% capacity of the volume stored.

10.3.50 It is anticipated that no lighting would be required post restoration.

10.3.51 In addition, the proposed habitat to be created would, once established, support foraging and commuting habitat for otters in an area which is currently unsuitable. With the proposed mitigation the long-term effects upon otter populations are considered to be beneficial.



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11 SUMMARY OF RESIDUAL EFFECTS

11.1 Likely residual effects

- 11.1.1 The implementation of the final restoration strategy would see the restoration of the main void to a permanent water body and the re-profiling of the OB1 overburden tip and retention of the open cliff to the east of the pit lake. The remaining areas of the site would remain as they stand today, and a variety of habitats encouraged to develop naturally and developing habitats further enhanced. It is considered likely that the residual effects would, ultimately upon establishment of the various habitat types proposed, increase over time to be a positive benefit compared to the baseline conditions that currently prevail.
- 11.1.2 The history of the site is one of considerable disruption resulting from mining activities and with the gradual reduction, and now cessation, of these operations the baseline, while poor, is likely to continue improving with time. There are now present a number of habitats and protected species that may otherwise not have existed here and it is necessary for the restoration to retain them, rather than attempting to return the site to a pre-mining condition.
- 11.1.3 The proposal is for a restoration scheme, the most potentially impactful activities (i.e. earthmoving) of which are largely localised to the void, where mining activity has most recently been carried out and thus habitat is most heavily degraded. As such, the area most likely to be impacted is also of least quality and there are few impacts that are thought likely to be of significant detriment to any of the valuable ecological receptors. This is especially true as the purpose of this assessment is to determine how the proposed works would impact the baseline, the condition of which has largely established during a period of disruption significantly beyond what is proposed.
- 11.1.4 With the incorporated mitigation measures, primarily focusing on avoidance and enhancement, it is uncertain that any detrimental impacts will be realised. The likely

residual effects upon the nature conservation interest at the site from the proposed restoration are considered to provide net benefits for biodiversity due to the impoverished baseline. The revised restoration proposals provide more opportunities for biodiversity through creating a wider range of terrestrial and aquatic habitats than the previously consented scheme.

- 11.1.5 While retaining these important features of the baseline, the enhancement measures included would result in the proposal having a positive effect on the site's biodiversity through habitat creation, improved connectivity and earth stabilisation.
- 11.1.6 **Table 11** provides a summary of the significance of residual effects for each receptor, as identified in **Section 10**, the mitigation measures required and the means by which mitigation measures can be secured.



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Table 11: Summary of residual effects on Valuable Ecological Receptors

VER	Value	Description of potential effect	Effect without mitigation	Mitigation	Significance of Residual Effect	Mechanism for securing
Non-statutory Designated Sites – Wildlife Sites						
Merthyr Common Central SINC	Local	Run-off generated by earthworks entering those waterbodies which drain into the SINC impacting water quality.	Minor – temporary reduction in water quality.	Use of silt fences around the work area to capture sediment before it enters channels leading to the SINC. A phased earthworks approach, disturbing one section at a time to minimise exposed soil and reduce erosion and runoff.	Neutral – beneficial over time as planting and re-seeding improves soil stability and reduces risk of run-off. Improvement in habitat connectivity as surrounding area is enhanced.	Details set out within a CEMP which can be Conditioned
Priority Habitats						
Running water	Local	Increased silt or pollutants during activities, which discharge into the watercourse.	Minor – temporary reduction in water quality	Works within and adjacent to the watercourse would be monitored by an Environmental Clerk of Works (ECOW). If discolouration of the watercourse is noted, works would stop and working practices reviewed.	Neutral – beneficial over time as planting and re-seeding improves soil stability and reduces risk of run-off. Improvement in habitat connectivity as surrounding area is enhanced.	As above

VER	Value	Description of potential effect	Effect without mitigation	Mitigation	Significance of Residual Effect	Mechanism for securing
				Pollution control measures		
Ponds - Standing water	Local	Dust arising from earthmoving can settling on ponds, blocking light needed for photosynthesis, disrupting the food web and affecting organisms dependent on plants and algae. Fine particles may alter sediment and suffocate invertebrates and amphibian larvae. Dust can also bring pollutants, potentially causing toxicity for sensitive aquatic species.	Minor – risk of temporary water quality reduction and degradation of habitat.	Dust suppression during earthmoving will involve avoiding work in windy or dry conditions, reducing vehicle speeds, and spraying water to prevent dust from becoming airborne.	Neutral – beneficial with time as planting and re-seeding around margins and wider habitat will improve soil stability, reducing dust and run-off.	As above
Acid flush	Local	Runoff from disturbed soils during re-grading of the northern slope of OB2 could carry sediments, nutrients,	Minor - risk of temporary degradation of habitat.	Dust suppression measures and installation of silt fencing at the base of OB2.	Neutral – beneficial overall as seeding would improve soil stability and decrease run-off. Tree planting	As above



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VER	Value	Description of potential effect	Effect without mitigation	Mitigation	Significance of Residual Effect	Mechanism for securing
		and potentially alter pH levels, which could disrupt the balance of this habitat.			would create a buffer zone, intercepting pollutants and windblown dust.	
Species (Fauna)						
Amphibians	Regional	Dust arising during land-forming could settle on water and may alter pH, increase turbidity, and introduce pollutants, reducing water quality. This can hinder amphibian respiration, feeding, and breeding. Higher turbidity also limits sunlight, impacting plant growth and lowering oxygen levels essential for pond organisms.	Moderate – risk of temporary degradation of habitat.	Dust suppression during earthmoving will involve avoiding work in windy or dry conditions, reducing vehicle speeds, and spraying water to prevent dust from becoming airborne.	Neutral –beneficial overall with the inclusion of enhancements to pond margins, planting to improve connectivity and creation of a new permanent waterbody. Establishment of aquatic vegetation will absorb contaminants and provide oxygen.	CEMP and Restoration and aftercare management plan secured by Condition.



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VER	Value	Description of potential effect	Effect without mitigation	Mitigation	Significance of Residual Effect	Mechanism for securing
Birds	Local	During re-profiling operations around the void there exists the potential for a 'slight' impact on the schedule 1 species <i>Falco peregrinus</i> (peregrine falcon) which is known to use the area for hunting.	Minor – temporary disturbance of hunting grounds.	Pre-works nesting bird checks.	Neutral – beneficial over time due to stabilisation of the void, planting and establishment of permanent water body.	Appropriately worded planning condition. CEMP and Restoration and aftercare management plan secured by Condition.
		Disturbance of nests during planting and re-seeding.	Neutral or minor – risk of disturbance.	Conduct planting and re-seeding outside of nesting season to areas with the potential to support nesting birds.	Neutral – beneficial effects to nesting birds over time due to habitat creation via planting.	Appropriately worded planning condition. CEMP and Restoration and aftercare management plan secured by Condition.
		Dust generated by earth-moving operations can settle on vegetation and in water, reducing food quality and contaminating drinking water for birds.	Minor – risk of habitat and health degradation.	Dust suppression measures.	Neutral – beneficial over time as new planting and seeding will improve soil stability.	CEMP

3274/11/20240306–Baseline Ecology Report. docx

Ffos-y-Fran Final Restoration Strategy

VER	Value	Description of potential effect	Effect without mitigation	Mitigation	Significance of Residual Effect	Mechanism for securing
Bats	Local	None envisaged	Neutral	Habitat creation	Neutral – beneficial over time as habitat to be created would, once established, support foraging and commuting habitat for local bat populations.	Restoration and aftercare management plan secured by Condition.
Otters	Local	Indirect pollution incidents	Minor - risk of temporary degradation of habitat	Habitat creation. Pollution control measures.	Neutral - beneficial over time as habitat to be created would, once established, support foraging and commuting habitat for local bat populations.	CEMP and Restoration and aftercare management plan secured by Condition.

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12 ASSESSMENT OF CUMULATIVE EFFECTS AND INTER-RELATIONSHIPS

12.1 Cumulative effects

12.1.1 Cumulative effects result from multiple actions on receptors and resources over time and are generally additive or interactive (synergistic) in nature. Cumulative effects can also be considered as:

‘...impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the project⁵⁰.’

12.1.2 Two principal types of cumulative effects are considered:

- **Intra-project effects:** These occur where a single receptor is affected by more than one source of effect arising from different aspects of the restoration scheme. An example of an intra-project effect would be where a receptor is affected by dust, noise and pollution during the restoration, with the result being a greater effect than each individual effect alone; and
- **Inter-project effects:** These effects occur as a result of a number of past, present or reasonably foreseeable proposed developments, which individually might not be significant, but when considered together could result in significant cumulative effects on a shared receptor and could include developments separate from and related to the scheme.

12.1.3 The cumulative effects of the restoration scheme have been considered in the cumulative effects report.

⁵⁰ European Commission, 1999.

12.2 Intra-project relationships

12.2.1 In identifying and assessing the likely impacts of the proposed restoration strategy on ecology and nature conservation, the inter-relationships with the environmental impacts identified in other disciplines reports has been considered. These include:

- **Geology and Soils** - The primary potential impact on most of the identified valuable receptors, including designated sites, habitats, and species, is pollution. This pollution could be in the form of dust or run-off from disturbed soils during re-grading and other earth-moving operations. The resulting sedimentation and nutrient or chemical runoff could disrupt the natural water quality and soil pH, impacting the ecological balance. Additionally, habitats such as wetlands and ponds could be affected by the introduction of fine sediments, which can settle on the pond bed, altering sediment composition and potentially suffocating invertebrates and amphibian larvae. The use of heavy machinery also carries the risk of fuel or oil spillages, posing a further pollution threat to these sensitive habitats.
- **Hydrology and Hydrogeology and Hydro-geochemical** - The existing void would remain with a permanent pit lake at between circa 175-185 m AOD in the base and would roughly correlate with a groundwater level pre-surface mining operations. The excavation of the void has effectively exposed the existing groundwater levels that have re-charged since surface mining ceased at the end of November 2023. Hydrologically, the void is considered likely to perform as a large soakaway or water detention basin with groundwater discharging slowly through the underground pathways to existing watercourses to the west and south-west of the site. Proposed changes to the hydrogeological regime following closure are not expected to differ substantially from the current site conditions from a quantity and quality perspective. Water quality will likely remain similar to the current baseline or improve following the restoration plan. As mining has ceased and exposed material which could act as a source of contamination is

mostly to be revegetated or reseeded, this will likely reduce the risk of pollution from these sources.

- **Landscape and visual** - - The restoration proposals and proposed landscaping has been informed by the potential ecological effects of the restoration on the Valued Ecological Receptors. Net gains and losses in biodiversity have been assessed and sensitive landscaping proposed, which creates/maintains connectivity and enhances existing biodiversity or creates new habitat with biodiversity value. The proposed ecological enhancements are highly likely to enhance the visual appearance of the Site through the reduction in bare ground and the enhancement/creation of habitats.
- **Cultural Heritage** - Ecological or cultural heritage elements resulting from the proposed restoration are not expected to negatively impact each other. The intra-relationship between these two aspects is likely to be mutually beneficial. As discussed, the restoration of the site is expected to improve the ecological health of the area, which could indirectly benefit the preservation of cultural heritage. For instance, the proposed planting of trees and shrubs, primarily an ecological enhancement, would help to stabilise the soil and prevent erosion which could damage archaeological sites. Furthermore, improvements in both ecology and cultural heritage would be expected to result in a cumulative improvement in the visual amenity of the Site as well as it's value as a recreational and educational location.
- **Air Quality** - The proposed restoration operations would give rise to emissions of both aerial pollutants and greenhouse gases in the short-term, primarily during earthworks. Given that the baseline habitat has established in the context of dust and fuel emissions well above, and for longer than, what is expected to occur during the present restoration proposal, it is unlikely that significant impacts would be experienced. In the longer-term, the establishment of the proposed new grass coverage and woodland planting is likely to reduce both airborne dust

and greenhouse gases. Grasses form a protective, low-lying canopy that reduces the amount of soil particles becoming airborne through wind erosion, thus lowering dust levels. In addition, the complex root networks of grasses help stabilise the soil, further preventing dust emissions. Trees, meanwhile, provide a taller, more substantial barrier, capturing airborne particles on their leaves and branches. Their canopies also slow down wind speeds, minimising the lofting of fine particles. Beyond dust mitigation, both grasses and woodlands absorb carbon dioxide through photosynthesis, thereby reducing overall greenhouse gas concentrations. As a result, these interventions not only help ensure cleaner, healthier air but also play a role in the long-term commitments to climate regulation.

- **Human Health** - As with air quality, while the proposed restoration would result in short-term increases of emissions, dust and noise, these would exist for a relatively short time and be significantly lower than that which the area has been subject to during its long history of mining. Planting and exposure to natural environments is known to provide a number of physical and mental health benefits⁵¹. By altering the presently barren, dusty landscape of the baseline through new planting, the quality of the air improves through natural filtration, reducing respiratory irritants and improving overall health in the immediate area. The rehabilitation of the landscape and inclusion of new habitats is likely to encourage outdoor activities, promoting physical exercise, fostering community social interaction, and enhancing mental well-being through stress reduction and increased connection to nature. This also offers the potential for educational visits where the opportunity would exist for the public to observe protected species such as Great Crested Newts, peregrine falcons, barn owls and specialised plant species like marsh orchids.

⁵¹ Hartig, T. *et al.* (2011). Health Benefits of Nature Experience: Psychological, Social and Cultural Processes. In: Nilsson, K., *et al.* Forests, Trees and Human Health. Springer, Dordrecht. https://doi.org/10.1007/978-90-481-9806-1_5

- **Climate Change** - The proposed restoration is likely to be beneficial in improving the resilience of the Site to climate change. In addition to increased carbon sequestration, the proposed planting, and associated improvement in connectivity, would provide corridors for animals and plants to migrate to more suitable environments, to or from the wider area. Grass seeding promotes the moisture retention ability of the ground, while tree planting increases shading, including around waterbodies where this can help to moderate water temperatures reducing excessive evaporation in hot weather and stabilise conditions. The inclusion of a large new waterbody in the void fed by ground water also provides a permanent source of freshwater, improving resilience during periods of drought by providing a reliable area for a range of species to drink and bathe.

12.3 Inter-project relationships

12.3.1 No significant effects with other developments are anticipated.

13 AFTERCARE AND MONITORING

13.1 Summary of measures for the aftercare and monitoring period

13.1.1 Aftercare would be carried out by the client for a period of 5 years. During that time a contractor (employed by the client) would carry out tasks such as grass cutting, weed control, replacement of dead plants, watering, repair of fences, cleaning out ditches, and other environmental measures. These tasks would be performed to ensure that the seeding and planting survive and successfully establish as new vegetation. At the end of the aftercare period the contractor would hand over the now established and healthily growing landscape and environmental mitigation to the client or other interested parties.

13.1.2 Throughout the aftercare period, and for as long as is necessary to fulfil commitments, the client would employ suitably qualified personnel to monitor the mitigation measures to:

- Ensure that it continues to develop properly to meet commitments and functions (E.g. trees should grow as planned)
- Review if it would achieve the commitment and function in the required time period
- Check for adverse or changing conditions that might compromise the effectiveness of mitigation and restoration measures
- Advise on maintenance interventions that might be required if a failure to meet commitments is identified, and
- Once the mitigation and restoration achieves full effectiveness monitoring could continue to ensure that it continues to perform its proposed function.

13.1.3 These measures are set out in more detail in the Restoration and Aftercare Management Strategy.

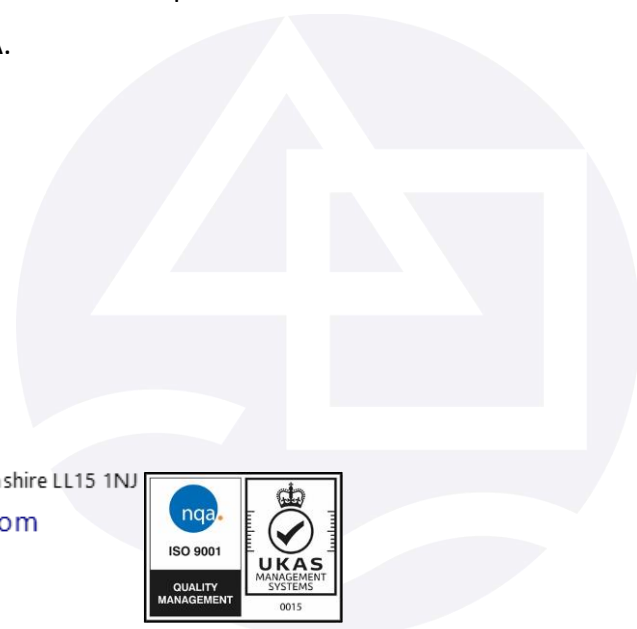
13.1.4 Details of the monitoring required would be established in consultation with NRW and the LPA and incorporated into the CEMP and carried through to the Restoration and Aftercare Management Strategy. Monitoring would include but is not limited to:

- Continued water quality status should be maintained and monitored during the restoration and aftercare period. Regular visual inspection and testing as needed of all discharges into the existing drainage system and pit void would be carried out.
- Regular inspection of surface water runoff control measures to ensure that sediment is not transported off site.
- Regular inspection of plant that contain fuels or chemicals to ensure there is no risk of spillage.

- Requirements for monitoring of protected species (for example GCN) would be set out in any required PWMS. This could include surveys of the ponds, where accessible, post restoration and during the aftercare period to ensure continued use by GCN and to advise upon any adaptations which would be required
- Monitoring for birds (e.g. Peregrine falcons) would be undertaken during restoration by the appointed ECOW and any occurrences and nesting behaviour would be noted and reported. It is likely that birds would be deterred by and displaced from utilising the void ledges due to ongoing noise and restoration and reprofiling activities, though breeding may occur during the aftercare period.

13.1.5 During the aftercare period regular monitoring visits would be undertaken to monitor the performance of the mitigation, including the establishment of tree, shrub and grass seeding.

13.1.6 Reports would be prepared for the client giving the results of each visit, any requirements for additional maintenance work and indicating how the scheme of mitigation is performing against agreed indicators. An annual report would bring these together at the end of each year of aftercare. At the end of the aftercare period a Handover Environmental Design Performance Report (HEDPR) would be prepared. The HEDPR would accompany the Handover Environmental management Plan to assist in any required long-term maintenance. These reports can be made available to interested parties, i.e. NRW and the LPA.



14 CONCLUSIONS

- 14.1.1 The proposed restoration scheme is likely to result in significant biodiversity benefits for the site, transforming a historically degraded landscape into a valuable ecological habitat. The scheme is centred around restoring and enhancing areas heavily impacted by mining activity, particularly around the void, which currently represents the most degraded habitat. This approach ensures that the most ecologically valuable areas remain undisturbed while targeting improvements where they are most needed.
- 14.1.2 The design of the scheme avoids and minimises potential adverse impacts on existing habitats and species, employing mitigation measures such as phased earthworks, dust suppression, and pollution control to ensure that ecological receptors are protected during implementation. Moreover, the incorporation of enhancement measures, including the creation of a permanent freshwater lake, mixed woodland planting, and restoration of acid grassland and heathland, is expected to significantly increase the ecological value of the site.
- 14.1.3 A key strength of the scheme is its alignment with the site's current ecological baseline, acknowledging that mining activity has introduced new habitats and species that now hold conservation value, demonstrated by the presence of great crested newts in many of the ponds and peregrine falcons utilising the edges of the void. By retaining and enhancing these features, the restoration plan improves habitat diversity and connectivity, benefiting a range of species, including amphibians and birds. The creation of new habitats and improved connectivity is expected to result in a net biodiversity gain, exceeding the provisions of the previously consented scheme.
- 14.1.4 In line with relevant legislation, including the Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015, the scheme demonstrates a forward-thinking approach to ecological restoration. It not only mitigates historical damage but also establishes a robust framework for long-term ecological

enhancement. Overall, the proposed development is anticipated to deliver a positive legacy for biodiversity, contributing to the site's ecological resilience and supporting a diverse range of species for future generations.



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APPENDIX A: FIGURE 2 - PHASE 1 HABITAT SURVEY MAP



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APPENDIX B: TABLE 3 - PHASE 1 HABITAT SURVEY TARGET NOTES

Target note	Description
1	Stabilised 'landslip' of overburden above north-east face of main excavation void. Currently devoid of vegetation. The westernmost edge of OB1 abutting the slip was observed to be used by a pair of peregrine falcons (<i>Falco peregrinus</i>) for feeding.
2	Coal conveyors and washing area.
3	Monster Mountain motocross track on top of OB3.
4	Levelled ground bordering south and western edges of track compound, currently used for visitor parking and amenities.
5	Group of concrete settling lagoons at southern point of OB3, fed by drainage pipe from base of mound via a penstock (sluice gate). Heavy ochre deposits were present on the penstock, the adjacent land and the lagoons forebay.
6	Partially modified stream and associated habitat mosaic including marshy grassland, wet flushes, willow carr, and waterbody containing broad-leaved pondweed (<i>Potamogeton natans</i>) and sphagnum (<i>S cuspidatum</i> sp.).
7	Merthyr Common Central Site of Importance for Nature Conservation (SINC). The site comprises a mosaic of habitats including waterbodies, reedbeds, small woodlands, marshy grassland and some derelict hard-standing. The hard-standing area includes a derelict brick building noted to be used by barn owl (<i>Tyto alba</i>) that were in residence at the time of survey. Records indicate that the main waterbody on site supports great crested newt (<i>Triturus cristatus</i>)
8	Species-poor grassland pasture, established during the first phase of restoration at Ffos-y-Fran. The grassland covers the western flank of the site and is currently used for grazing sheep.
9	Main opencast void, currently being excavated for coal with arising overburden being simultaneously deposited along the western edge.
10	Rock face created from bedrock exposure following coal extraction. Ledges noted to be occupied by common bird species including feral pigeon (<i>Columba livia domestica</i>), herring gull (<i>Larus argentatus</i>), glaucous gull (<i>Larus hyperboreus</i>) and jackdaw (<i>Coloeus monedula</i>). Peregrine falcons were noted, prospecting the cliff edges for prey.

APPENDIX C: FIGURE 3 – GCN SURVEYS POND LOCATION PLAN AND EDNA STATUS



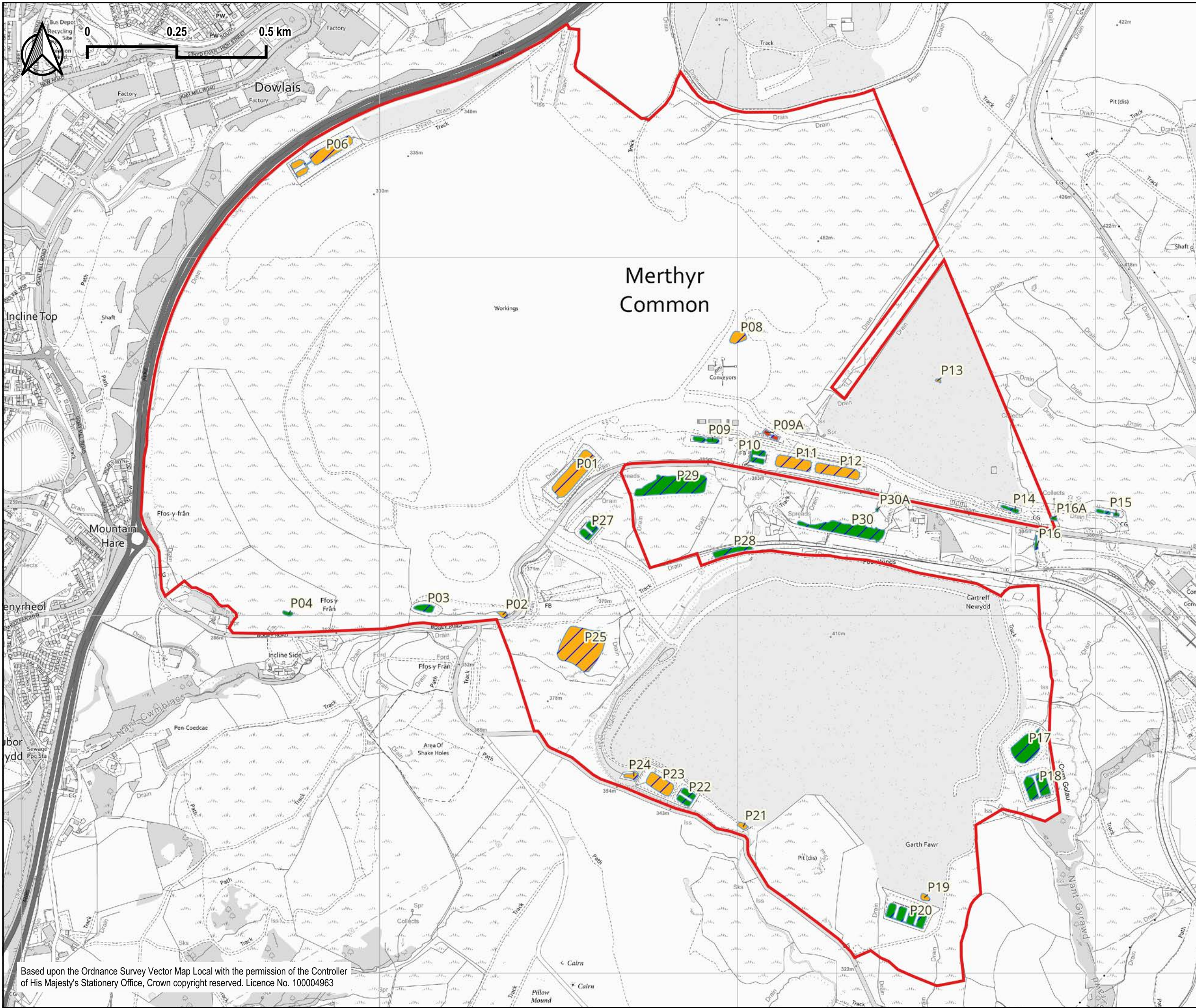
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Cleient / Client:

MERTHYR

(SOUTH WALES)

LIMITED

Enw project / Project name:

FFOS-Y-FRAN

FINAL RESTORATION STRATEGY

Teitl lluniad / Drawing title:

GCN Surveys

Pond Location Plan

Eglurhad / Key:

Site Boundary

Results Void

Negative GCN DNA result

Positive GCN DNA result

Nodiau/Notes:

P05, access limited, HSI only

P07, no longer exists, no HSI

P26, only has water in winter months, no HSI

Graddfa / Scale (A3):

1:10,000 @ A3

Dyddiad / Date:

June 2024

Perfformwyd gan:

RLJ

Rhif lluniad / Drawing number:

Figure 03

Gwilydd gan:

AEL

Darparwyd gan / Prepared by:

RML

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APPENDIX D; TABLE 4: POND HSI TABLE

Ref	Description	Image
P01	Settlement lagoon with riparian zone consisting of a combination of colliery silt and small pebbles, almost devoid of vegetation with the exception of three saplings of <i>Salix</i> spp. growing on extruding silt deposits. Patches of <i>Potamogeton</i> spp. are present in the centre and toward the margins, covering approximately 10% of surface area. eDNA result:Negative HSI Score:0.58 (below average) Lined (y/n):No	
P02	At the time of surveying (June) this pond was almost entirely vegetated, with minimal open water and had taken on the characteristics of marshy grassland. The dominant plants were rushes such as <i>Juncus effusus</i> and <i>Typha</i> spp. During the winter months it is likely that the water level increases, forming a more typical pond. eDNA result:Negative HSI Score:0.50 (Poor) Lined (y/n):No	

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Ref	Description	Image
P03	The riparian zone/banks were entirely of exposed pond liner with no vegetation. Approximately 20% of the eastern end of the pond area was composed of a solidly vegetated mat. This mat consisted of a diverse range of grasses (such as common Bent, <i>Agrostis capillaris</i>; crested dog's-tail, <i>Cynosurus cristatus</i> and Sweet Vernal-grass, <i>Anthoxanthum odoratu</i>), sedges (primarily <i>Carex</i> spp.), numerous saplings of eared willow (<i>Salix aurita</i>) and some small gorse. Submerged vegetation was dominated by <i>Elodea</i> spp. Which covered almost the entire bottom of the pond. Approximately 40-50% of the surface area was comprised of <i>Potamogeton</i> spp. eDNA result:Positive HSI Score:0.75 (Good) Lined (y/n):Yes	
P04	Set within a previously restored area of grazed grassland, the majority of the riparian zone was free of vegetation, consisting of bare stoney ground, with the exception of a single stand of <i>Juncus</i> spp. This species also comprised the only vegetation within the pond itself, in the form of an emergent stand of less than 5% of the area eDNA result:Positive HSI Score:0.51 (Below average) Lined (y/n):No	

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Ref	Description	Image
P06	The banks of the largest of the three sub-divisions. At the northeastern end was a small strip of densely matted vegetation (primarily <i>Juncus</i> spp.) which formed approximately 5% of the pond area. Minimal aquatic vegetation was observed. The banks of the two adjacent smaller sub-divisions also consisted of exposed liner, though the degree of exposure was significantly less than the larger pond. Marginal vegetation in both these ponds was comprised of <i>Typha</i> spp. (less than 10% of the total area) and floating vegetation in the form of <i>Potamogeton</i> spp. covered approx. 20-30% of the surface of each. eDNA result:Negative HSI Score:0.47 (Poor) Lined (y/n):Yes	
P08	This pond contained minimal vegetation with the exception of coltsfoot (<i>Tussilago farfara</i>) growing within the colliery spoil which forms the banks and surrounding area. No aquatic vegetation was observed. eDNA result:Negative HSI Score:0.30 (Poor) Lined (y/n):No	

Ref	Description	Image
P09	This pond was comprised of two adjacent sub-divisions. Both were surrounded by a short strip of exposed liner which transitioned into an area of silt deposit before the waters edge. Of the easterly of the two were several small overhanging bushes (<i>Salix</i> spp.) forming approximately 40% of the margin. The surface of this pond was largely covered by <i>Potamogeton</i> spp. interspersed with emergent <i>Juncus</i> spp. Leaves and a stand of <i>Typha</i> spp. The more westerly pond was largely of the same composition but contained significantly more <i>Juncus</i>, which formed a dense strip around approximately 40% of the margin. eDNA result:Positive HSI Score:0.45 (Poor) Lined (y/n):Yes	
P9a	This washout lagoon was heavily coloured by ochre and contained no submerged or floating vegetation. There were small patches of <i>Juncus</i> and <i>Tussilago farfara</i> around the margins, making up less than 5%. eDNA result:Inconclusive* HSI Score:0.43 (Poor) Lined (y/n):No *Due to suspended sediment levels.	

Ref	Description	Image
P10	The margins of both sub-divisions were well vegetated with a composition of sedges (primarily <i>Carex</i> spp.), rushes (<i>Juncus</i> spp.), reedmace (<i>Typha</i> spp.), <i>Salix</i> saplings and <i>Elodea</i> spp. The surface was covered by <i>Potamogeton</i> spp. eDNA result: Positive HSI Score: 0.64 (Average) Lined (y/n): No	
P11	Banks were dominated by short, patchy graminoids and forbs. These included various grasses, rushes, sedges, horsetail (<i>Equisetum</i>), coltsfoot, thistles, red sorrel (<i>Rumex acetosella</i>). Vegetation was most dense where silt had accumulated at the outflow. Here there were taller stands of <i>Typha</i>, <i>Equisetum</i>, <i>Juncus</i> and <i>Salix</i> saplings. eDNA result:Negative HSI Score:0.43 (Poor) Lined (y/n):No	

Ref	Description	Image
P12	Largely similar to the adjacent pond 11, with the exception of dense marginal patches of <i>Equisetum</i> in the corners. eDNA result:Negative HSI Score:0.44 (Poor) Lined (y/n):No	
P13	A shallow pond with minimally discernible banks on the top of OB2, much of the margin and surface was dominated by emergent <i>Juncus</i> interspersed with patches of algae. eDNA result:Negative HSI Score:0.45 (Poor) Lined (y/n):No	

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Ref	Description	Image
P14	Adjacent to wheel wash when approaching Bogey Road crossing point. Limited Vegetation but connectivity to better ponds and wider foraging areas to East. eDNA result:Positive HSI Score:0.65 (Average) Lined (y/n):No	No Image
P15	The margins of this pond were very well vegetated, primarily by <i>Equisetum</i> interspersed with <i>Juncus</i> and <i>Carex</i> as well as a few small <i>Salix</i> saplings. Submerged vegetation was limited but there were areas of <i>Elodea</i> spp. and some floating <i>Potamogeton</i> patches. eDNA result:Positive HSI Score:0.74 (Good) Lined (y/n):No	

Ref	Description	Image
P16	Approximately 50% of the area was predominantly exposed silt with a narrow channel of shallow water draining into a deeper section at the other end. The margins were well vegetated, primarily by grasses, a single gorse bush and patches of <i>Juncus</i>, with <i>Equisetum</i> occasionally protruding through the exposed silt deposits. eDNA result:Positive HSI Score:0.43 (Poor) Lined (y/n):No	
P16 a	Well vegetated with 50% of the margin consisting of a dense <i>Typha</i> stand with the remaining area comprised primarily of short grasses and small patches of <i>Juncus</i>. The majority of surface area consisted of a dense mat of <i>Potamogeton</i>. eDNA result:Positive HSI Score:0.64 (Average) Lined (y/n):No	

Ref	Description	Image
P17	Wide banks covered with short and patchy grasses and mosses interspersed with coltsfoot. The margin was largely dominated by a thin strip of <i>Juncus</i> with occasional overhanging <i>Salix</i> bushes. Much of the surface area was covered by a thin mat of <i>Potamogeton</i>. eDNA result:Positive HSI Score:0.68 (Average) Lined (y/n):No	
P18	The banks of both sub-divisions were well vegetated, consisting mostly of very short grasses and forbs. Marginal vegetation was minimal with the occasional small stand of <i>Juncus</i> and <i>Typha</i>. Floating vegetation was also relatively minimal, with some small areas of <i>Potamogeton</i> toward the margins where the water was shallower. eDNA result:Positive HSI Score:0.65 (Average) Lined (y/n):No	

Ref	Description	Image
P19	50% of the margin comprised a sheer wall where material has slipped from the adjacent OB3. The accessible margin showed no discernible bank, transitioning from grassland directly to shallow water, followed by a steep drop off into deep, clear water. Around the shallow marginal strip was submerged grass with emergent <i>Juncus</i> and the occasional <i>Typha</i>. Over the deepest section a mat of <i>Potamogeton</i> was evident. eDNA result:Negative HSI Score:0.58 (Below average) Lined (y/n):No	
P20	The banks of both sub-divisions were sparsely vegetated by short, dry and patchy grasses and mosses interspersed with lichen. Marginal vegetation was limited to small patches of <i>Juncus</i>. The dominant feature was the presence of large over-hanging bushes around much of water's edge, predominantly <i>Salix</i> and <i>Betula</i> with the occasional <i>Buddleja</i>. eDNA result:Positive HSI Score:0.68 (Poor) Lined (y/n):No	

Ref	Description	Image
P21	Fed by Bargod taf stream and formed in a depression at the foot of OB3. A high-quality and heavily vegetated pond with clear water. Much of the riparian zone is dominated by large <i>Salix</i> bushes surrounded by <i>Juncus</i> and tall ruderals such as rosebay willowherb (<i>Chamaenerion angustifolium</i>) and foxglove (<i>Digitalis purpurea</i>). The margins are dominated by a dense mat of <i>Equisetum</i> interspersed with <i>Juncus</i>, <i>Carex</i> and grasses (mainly <i>Cynosurus cristatus</i> and <i>Anthoxanthum odoratu</i>). The surface of the pond is largely covered by <i>Potamogeton</i> with emergent <i>Typha</i> and <i>Equisetum</i> scattered throughout. eDNA result:Negative HSI Score:0.75 (Good) Lined (y/n):No	
P22	Both sub-divisions have similar characteristics, with banks dominated by <i>Salix</i> bushes and occasional <i>Buddleja</i>. The majority of the margins consist of a thin covering of <i>Typha</i>. Submerged and floating vegetation were not observed. eDNA result:Positive HSI Score:0.70 (Good) Lined (y/n):No	

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Ref	Description	Image
P23	The banks were dominated by mosses and short grasses interspersed with <i>Tussilago farfara</i>, hawksbit (<i>Leontodon</i> spp.), thistles (<i>Cirsium</i> spp.) and <i>Equisetum</i>. Numerous self-set <i>Salix</i> and <i>Buddleja</i> bushes were also present along the banks. Marginal vegetation was generally minimal, with the exception of dense <i>Typha</i> stands growing on a silt deposit at the western end. Sparse mats of <i>Potamogeton</i> were present on the surface over much of the area. eDNA result:Negative HSI Score:0.60 (Average) Lined (y/n):No	
P24	Banks consist mainly of coal spoil and fine gravel, with some areas of larger rubble deposits, thinly covered by short grasses and <i>Tussilago</i>, with self-set <i>Salix</i> saplings dotted throughout. <i>Typha</i> covers nearly the entire margin, with some small patches of <i>Juncus</i> growing on transitional silt deposits. The eastern half of the pond is largely un-vegetated open water, with the northern half divided equally between exposed silt followed by dense <i>Typha</i>. eDNA result:Negative HSI Score:0.66 (Average) Lined (y/n):No	

Ref	Description	Image
P25	A large pond with characteristics of a small lake, set within a moorland habitat of grasses (Yorkshire fog, <i>Halcus lanatus</i>; Purple moor-grass, <i>Molinia caerulea</i>; Cotton grass, <i>Eriophorum angustifolium</i>), rushes (mainly <i>Juncus effusus</i>) and sedges (mainly yellow sedge, <i>Carex demissa</i>). Banks were shallow and poorly defined, dominated by <i>Juncus</i> transitioning into a rocky bed. Submerged vegetation was primarily of <i>Elodia</i> spp. and floating vegetation was absent. eDNA result:Negative HSI Score:0.47 (Poor) Lined (y/n):No	
P27	The banks were dominated by a sparse mixture of <i>Equisetum</i>, <i>Juncus</i>, Hawkbit (<i>Leontodon</i>), Bird's-foot trefoil (<i>Lotus corniculatus</i>) and white clover (<i>Trifolium repens</i>), interspersed with spear-thistle (<i>Cirsium vulgare</i>) and self-set <i>Salix</i> of varying sizes. A small strip of pond liner was exposed adjacent to the water's edge and marginal vegetation was largely absent. The more southerly of the two sub-divisions contained a thin mat of <i>Potamogeton</i> over approximately 20% of the area, whereas aquatic vegetation was absent from the more northerly sub-division. eDNA result:Positive HSI Score:0.61 (Average) Lined (y/n):Yes	

Ref	Description	Image
P28	The pond is formed in a narrow depression along the route of the old railway track. The western edge is largely un-vegetated and of bare ground and small pebbles. The northern, eastern and southern banks are covered mainly by <i>Juncus</i>, with bracken (<i>Pteridium</i>) and spear-thistle (<i>Cirsium vulgare</i>). The pond itself was free of aquatic vegetation. In addition to the pond, a narrow drainage channel, with some open water, dominated by <i>Typha</i>, <i>Juncus</i> and <i>Eriophorum</i> runs adjacent to the northern edge. eDNA result:Positive HSI Score:0.68 (Average) Lined (y/n):Unknown	
P29	Within the central ecological zone, the northern and western edges of this large pond show no discernible bank, with dense <i>Juncus</i> transitioning into open water. This area is also interspersed with <i>Carex</i>, <i>Typha</i>, <i>Eriophorum</i> and large <i>Salix</i> bushes. The southern and eastern edges are defined by a grassy bank with <i>Pteridium</i>. Aquatic vegetation was limited to sparse areas of <i>Elodea</i> around the margins. eDNA result:Positive HSI Score:0.77 (Good) Lined (y/n):No	

Ref	Description	Image
P30	A large pond within the central ecological zone, very similar in composition to Pond 29, with the exception of a significant amount of <i>Equisetum</i> interspersed with <i>Juncus</i> and ground flora of <i>Sphagnum</i>. The bank along the eastern and southern edges contains some bushes of gorse (<i>Ulex</i>) and hawthorn (<i>Crataegus monogyna</i>) in addition to the <i>Salix</i>. The eastern and western margins are dominated by dense stands of <i>Typha</i>. eDNA result:Positive HSI Score:0.77 (Poor) Lined (y/n):No	
P30 a	A smaller pond within the central ecological zone with poorly defined banks covered by <i>Carex</i>, <i>Juncus</i>, <i>Eriophorum</i> and <i>Equisetum</i>. <i>Typha</i> grows around the margins and is sparsely emergent throughout the rest of the surface area. eDNA result:Positive HSI Score:0.62 (Average) Lined (y/n):No	

APPENDIX E; SURESCREEN GCN EDNA REPORT



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Folio No: 2099-2024
Purchase Order: 1446
Contact: RML Consult
Issue Date: 27.06.2024

GCN Report

Technical Report



SureScreen Scientifics

GCN eDNA Analysis

Summary

When great crested newts (GCN), *Triturus cristatus* , inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analyzing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

Results

Lab ID	Site Name	OS Reference	Degradation Check	Inhibition Check	Result	Positive Replicates
6173	FYF, P30A-3274		Pass	Pass	Positive	1/12
6174	FYF, P16-3274		Pass	Pass	Positive	1/12
6175	FYF, P25-3274		Pass	Pass	Negative	0/12
6176	FYF, P28-3274		Pass	Pass	Positive	10/12
6177	FYF, P16A-3274		Pass	Pass	Positive	5/12
6178	FYF, P29-3274		Pass	Pass	Positive	1/12
6179	FYF, P27-3274		Pass	Pass	Positive	6/12
6180	FYF, P30-3274		Pass	Pass	Positive	9/12
6181	FYF, P17-3274		Pass	Pass	Positive	4/12
6182	FYF, P18-3274		Pass	Pass	Positive	7/12



Folio No: 2099-2024
Purchase Order: 1446
Contact: RML Consult
Issue Date: 27.06.2024

6183	FYF, P24-3274	Pass	Pass	Negative	0/12
6184	FYF, P23-3274	Pass	Pass	Negative	0/12
6185	FYF, P21-3274	Pass	Pass	Negative	0/12
6186	FYF, P20-3274	Pass	Pass	Positive	3/12
6187	FYF, P19-3274	Pass	Pass	Negative	0/12
6188	FYF, P22-3274	Pass	Pass	Positive	1/12
6189	FYF, P15-3274	Pass	Pass	Positive	1/12
6190	FYF, P03-3274	Pass	Pass	Positive	12/12
6191	FYF, P02-3274	Pass	Pass	Negative	0/12
6192	FYF, P01-3274	Pass	Pass	Negative	0/12
6193	FYF, P13-3274	Pass	Pass	Negative	0/12
6194	FYF, P08-3274	Pass	Pass	Negative	0/12
6195	FYF, P06-3274	Pass	Pass	Negative	0/12
6196	FYF, P04-3274	Pass	Pass	Positive	3/12
6197	FYF, P11-3274	Pass	Pass	Negative	0/12



6198	FYF, P09A-3274	Pass	Inhibited Sample	Inconclusive	-/12
6199	FYF, P09-3274	Pass	Pass	Positive	3/12
6200	FYF, P12-3274	Pass	Pass	Negative	0/12
6201	FYF, P10-3274	Pass	Pass	Positive	8/12
6202	FYF, P14-3274	Pass	Pass	Positive	8/12

Matters affecting result: none

Reported by: Daisy Chambers

Approved by: Chelsea Warner



Methodology

The samples detailed above have been analyzed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample tube which then undergoes DNA extraction. The extracted sample is then analyzed using real-time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded. Analysis of eDNA requires attention to detail to prevent the risk of contamination. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added analytical security.

SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

- Sample Integrity Check:** When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.
- Degradation Check:** **Pass/Fail.** Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.
- Inhibition Check:** **Pass/Fail.** The presence of inhibitors within a sample is assessed using a DNA marker. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.
- Result:** **Presence of GCN eDNA (Positive/Negative/Inconclusive)**
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with the WC1067 Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.
Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for GCN presence or absence.



APPENDIX F: FIGURE 4 – STATUORY DESIGNATED SITES FOR BATS WITHIN 30KM



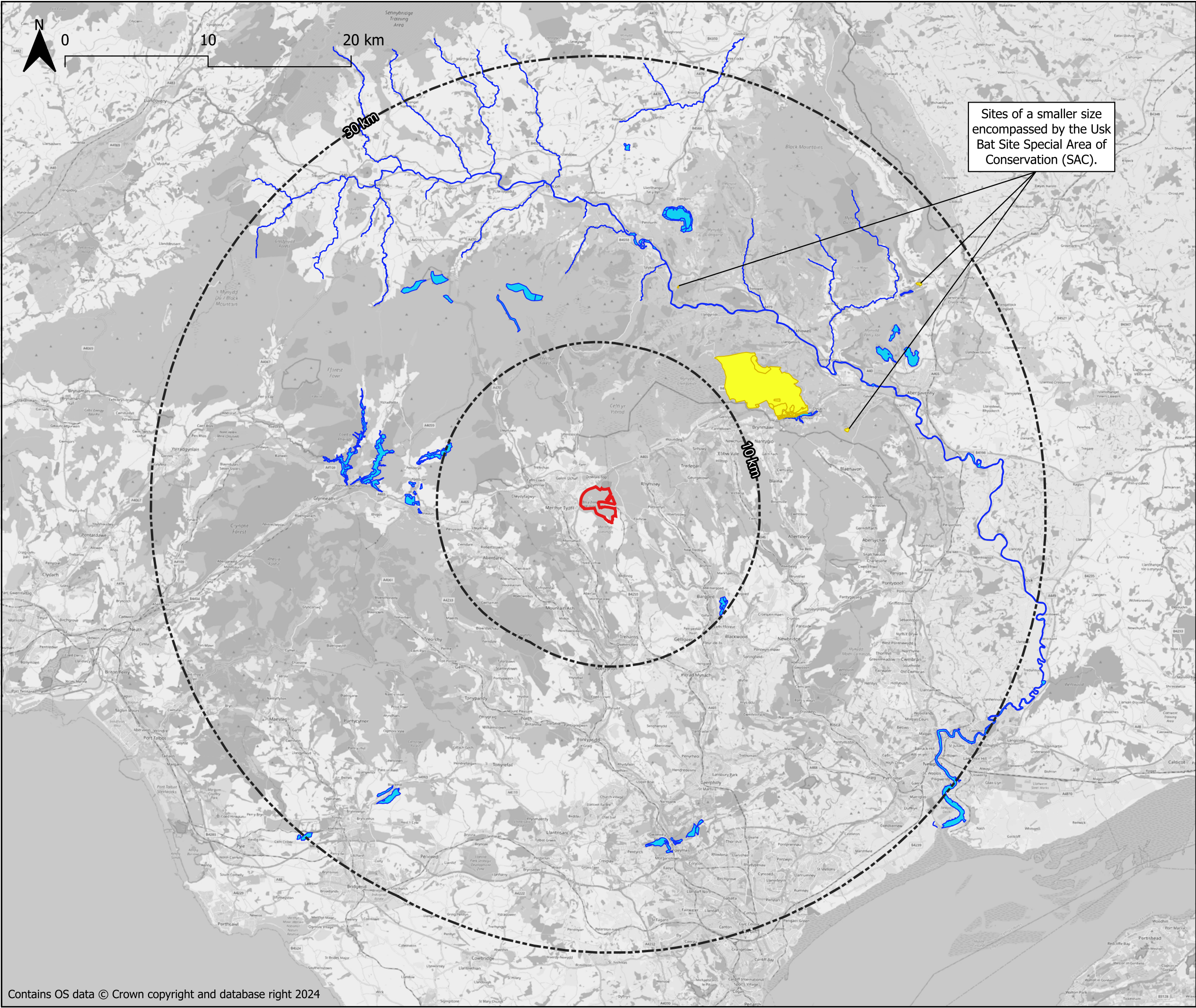
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Cleient / Client:

MERTHYR
(SOUTH WALES)
LIMITED

Enw project / Project name:

FFOS-Y-FRAN
FINAL RESTORATION STRATEGY

Teitl lluniad / Drawing title:

Statutory Designated Sites
for Bats within 30km

Eglurhad / Key:

Site Boundary

10 km-Zone Of Influence

30 km - Zone Of Influence

Usk Bat Site - Special Area of Conservation (SAC)

Special Area of Conservation (SAC)

Graddfa / Scale (A3):

Dyddiad / Date:

Darlunwyd gan:

1:250,000@ A3

Dec 2024

Drawn by:

Rhif lluniad / Drawing number:

Darlunwyd gan:

Checked by:

Figure 04

AL

Darparwyd gan / Prepared by:

RML

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e-bod/e-mail: info@rml.co.uk, www.rml.co.uk

APPENDIX G: FIGURE 5 – SITES OF SPECIAL SCIENTIFIC INTEREST WITHIN 5KM OF ZOI



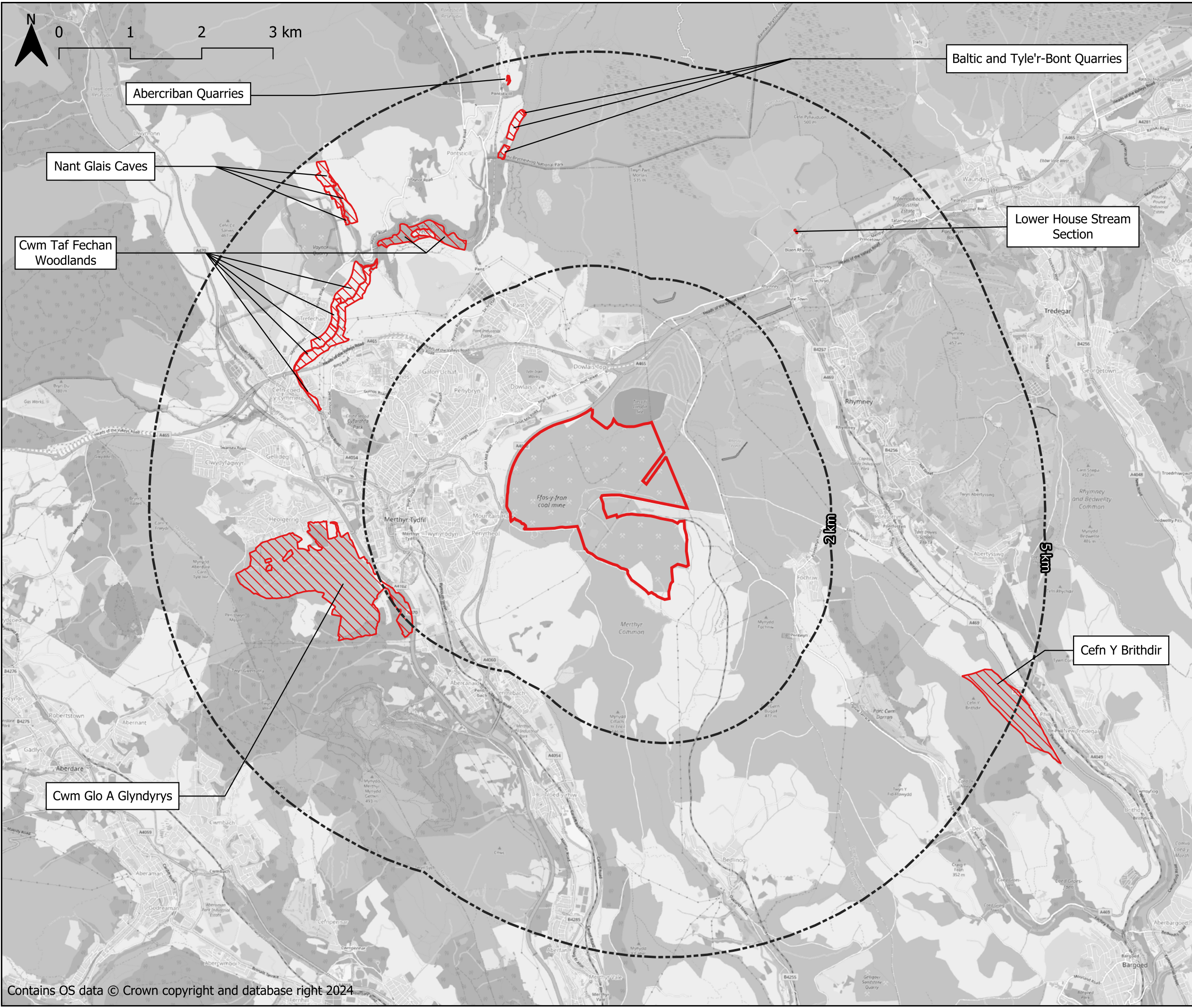
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(SOUTH WALES)
LIMITED**

Enw project / Project name:

**FFOS-Y-FRAN
FINAL RESTORATION STRATEGY**

Teitl lluniad / Drawing title:

**Sites of Special Scientific Interest
within 5km ZOI**

Eglurhad / Key:

Site Boundary

2 km Zone of Influence

5 km Zone of Influence

Site of Special Scientific Interest
(SSSI)

Graddfa / Scale (A3):
1:50,000 @ A3

Dyddiad / Date:
Dec 2024

Darlunwyd gan:
Drawn by:
KM

Rhif lluniad / Drawing number:
Figure 05

Gwiriwyd gan:
Checked by:
AL

Cymeriad:
Revision:
01

Darparwyd gan / Prepared by:



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e-bodeb-e-mail: info@rml.co.uk, www.rml.co.uk

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APPENDIX H: FIGURE 6 - WILDLIFE / SITES OF IMPORTANCE FOR NATURE CONSERVATION (SINC) WITHIN 2KM



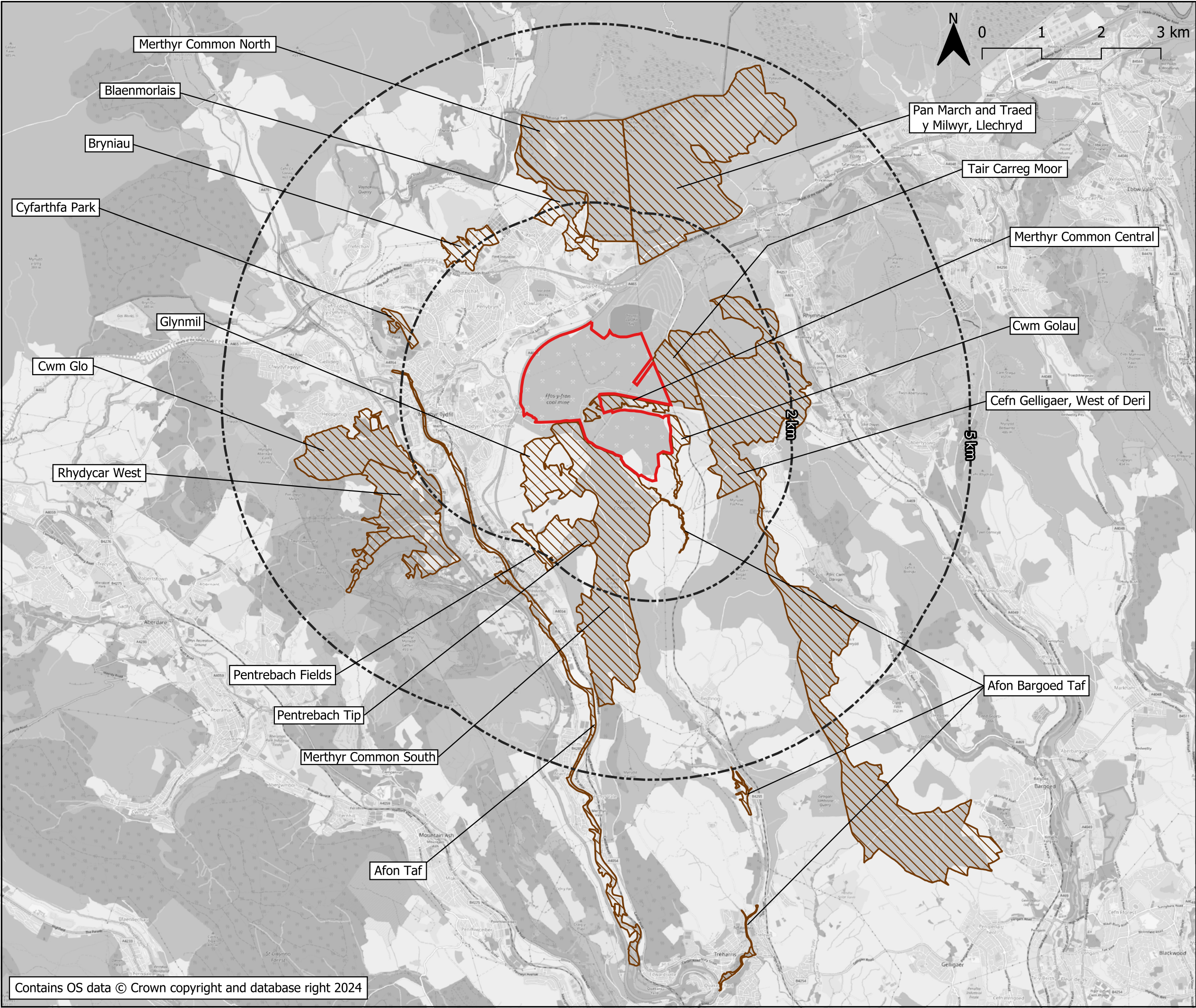
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Cleint / Client:

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LIMITED**

Enw project / Project name:

**FFOS-Y-FRAN FINAL
RESTORATION STRATEGY**

Teitl lluniad / Drawing title:

**Wildlife / Sites of Importance for Nature
Conservation (SINC) within 2km**

Eglurhad / Key:

Site Boundary

Wildlife Site / Sites of Importance
for Nature Conservation (SINC)

Graddfa / Scale (A3):

1:60,000

Dyddiad / Date:

Dec 2024

Darlunwyd gan:
Drawn by:

KM

Rhif lluniad / Drawing number:

Figure 06

Gwirwyd gan:
Checked by:

AL

Darparwyd gan / Prepared by:

RML

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APPENDIX I: FIGURE 7 - ANCIENT WOODLAND WITHIN 2KM

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APPENDIX J: FIGURE 8 - ORCHID LOCATION PLAN

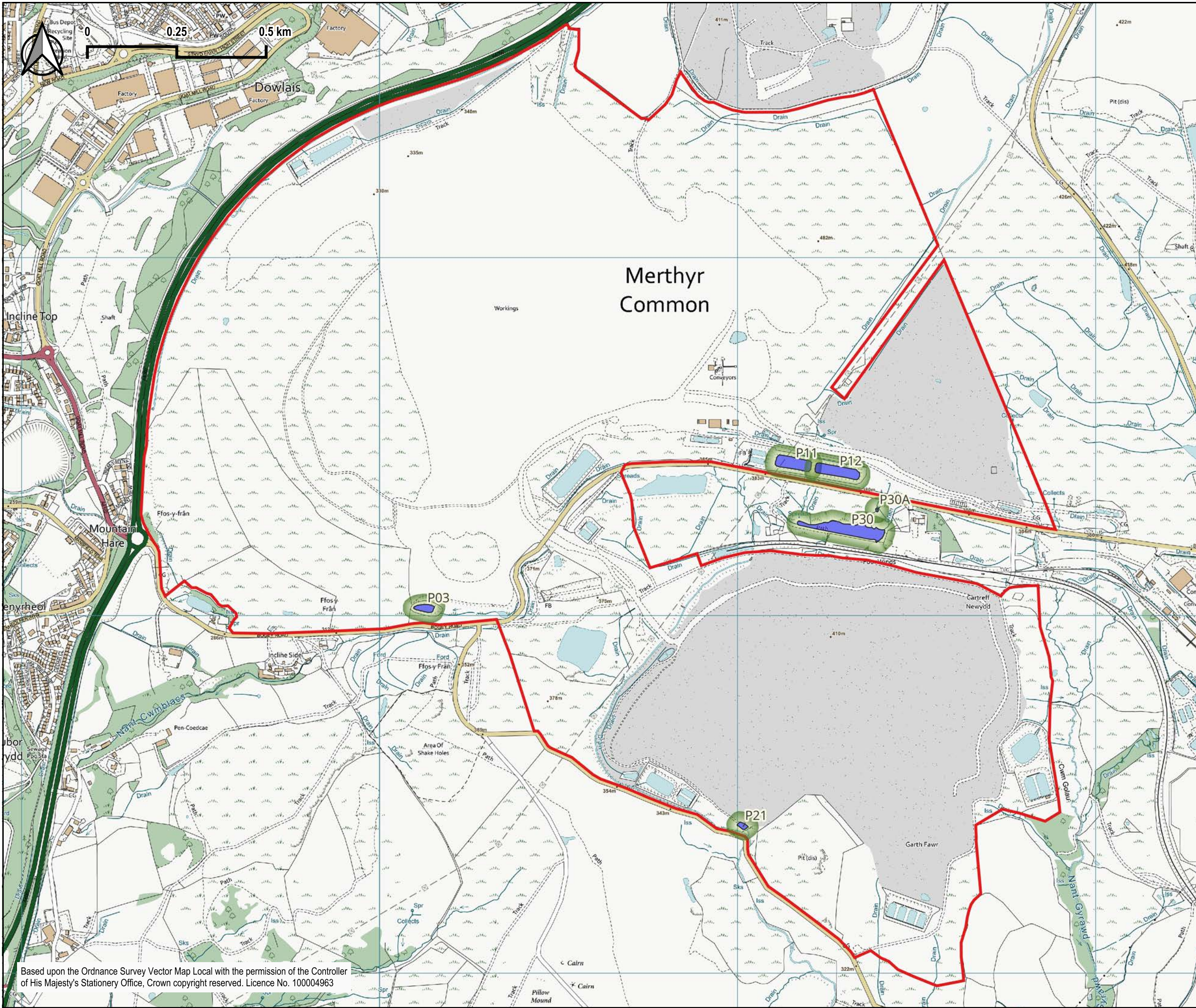
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Cleient / Client:

**MERTHYR
(SOUTH WALES)
LIMITED**

Enw project / Project name:

**FFOS-Y-FRAN
FINAL RESTORATION STRATEGY**

Teitl lluniad /
Drawing title:

Orchid Location Plan

Eglurhad / Key:

Site Boundary

Orchids present

Nodiau/Notes:

All plants were the same species: Southern marsh orchid (Dactylorhiza praetermissa). Relatively common in southern Wales/England, favours damp or marshy ground; it can be frequent on post-industrial land, especially quarries, clay-pits and colliery tips. Typically in flower from mid-May to mid/late July. June is the peak month for seeing them.

Graddfa / Scale (A3):
1:10,000 @ A3

Dyddiad / Date:
June 2024

Defnyddwyd gan:
Drawn by:
RLJ

Rhif lluniad / Drawing number:
Figure 8

Gwilyddwyd gan:
Checked by:
AEL

Cwybwydwyd gan:
Reviewed by:
01

Darparwyd gan / Prepared by:



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APPENDIX K: FIGURE 9 - OVERLAY OF PROPOSED EARTHWORKS AND PHASE 1 HABITAT MAP



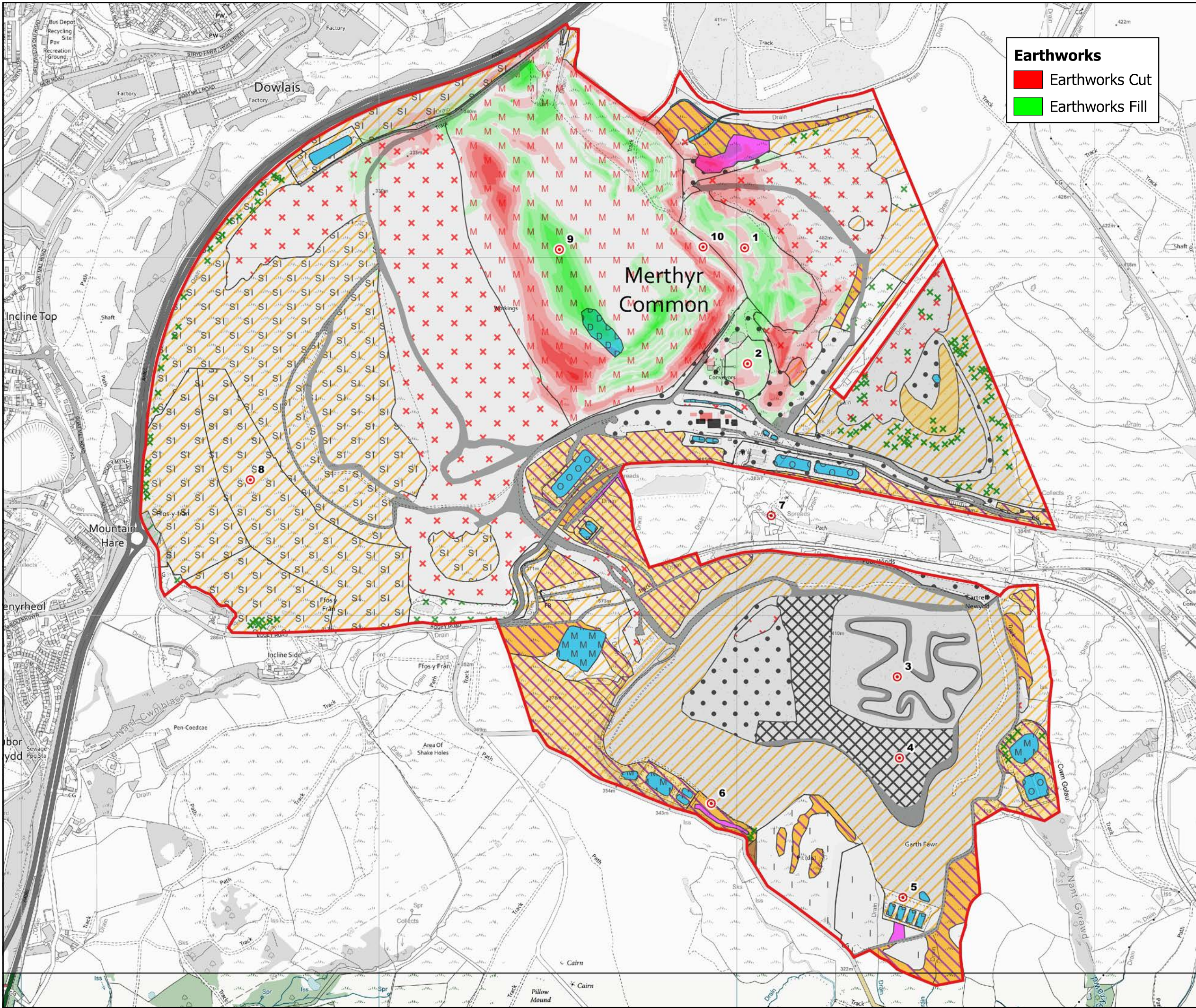
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Cleient / Client:

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LIMITED**

Enw project / Project name:

**FFOS-Y-FRAN
FINAL RESTORATION STRATEGY**

Teitl lluniad / Drawing title:

**Phase 1 Habitat Survey
Earthworks Cut-Fill**

Eglurhad / Key:

Site Boundary

Habitat Classification

A1.3.2 - Mixed woodland - plantation

A2.2 - Scrub - scattered

B1.1 - Acid grassland - unimproved

B1.2 - Acid grassland - semi-improved

B4 - Improved grassland

B5 - Marsh/marshy grassland

C1.1 - Bracken - continuous

D2 - Wet dwarf shrub heath

D3 - Lichen/bryophyte heath

D5 - Dry heath/acid grassland

D6 - Wet heath/acid grassland

E2.1 - Flush and spring - acid/neutral flush

G1 - Standing water

G1.1 - Standing water - eutrophic

G1.2 - Standing water - mesotrophic

G1.3 - Standing water - oligotrophic

G1.4 - Standing water - dystrophic

I2.2 - Spoil

I2.3 - Mine

J3.4 - Caravan site

J3.6 - Buildings

J3.7 - Track

J4 - Bare ground

J5 - Other habitat - hardstanding

Scrub, scattered

Target Note

Graddfa / Scale (A3):

Dyddiad / Date:

Defnyddio gan:

1: 10000@ A3

Dec 22024

Drawn by: KM

Rhif lluniad / Drawing number:

Gwilydd gan:

Chwiliad gan:

Figure 09

AL

Checked by:

Darparwyd gan / Prepared by:

Revisiwn:

01

RML

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APPENDIX L; FIGURE 10: OVERLAY OF PROPOSED EARTHWORKS AND POND LOCATION PLAN



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