

Southeast Wales Industrial Ironworks Landscapes

Year 6: The Aberdare-Hirwaun-Penderyn Corridor and Eastern Valley

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A report for Cadw
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1 Introduction and Acknowledgements

1.1 Introduction

The landscapes of the iron making industry of South East Wales represent an increasingly rare and important historic landscape and archaeological resource, which remains under considerable threat from a variety of developments from reclamation and landscape renewal to residential and industrial development. For this reason the current project has been instigated, to assess the current state of survival/preservation of the ironworks landscapes of the northern coalfield rim, and inform conservation, protection and management requirements through providing recommendations for the proactive and long-term management the ironwork areas.

In essence the work will help to ensure that any necessary change to industrial ironworks landscape is accommodated without sacrificing the essential integrity and coherence of the historic environment.

The latter half of the twentieth century saw the wholesale clearance, reclamation and development of many industrial sites in the South East Wales region. Ironworks, in particular have been vulnerable to landscape reclamation and renewal schemes, to such an extent that the vast majority of ironworks have at least in part been affected, and the process is ongoing. Therefore, it is both opportune and welcome that this project has been instigated, commissioned and funded by Cadw as part of an on-going initiative. It is hoped that this report will provide the catalyst for the urgent consideration of the future conservation of ironworks and their associated landscapes.

The current report sets out the results of the project, with a section defining the aims, and methodology. It also summarises the known and potential threats and provides general recommendations and establishes management/conservation priorities.

The main body of the report, Section 6, identifies and briefly describes the extraction areas and landscapes and water management sub-systems visited during year 6 of the project. These areas have been digitally mapped using a MapInfo Geographical Information System, and figures have been produced to illustrate the various interests. The extraction areas and water management features mapped are based on a combination of the first edition 1:2500 OS map, Landmark mapping, kindly provided by Cadw under licence agreement, and aerial photographic mapping.

1.2 Acknowledgements

The project was commissioned by Cadw and undertaken by the Glamorgan-Gwent Archaeological Trust (GGAT) in their remit as the regional archaeological body responsible for the understanding and preservation of the archaeological resource in southeast Wales.

The Trust would like to thank the staff of the Glamorgan Record Office at Cardiff, and the National Library of Wales, Aberystwyth, for their assistance, The National Assembly for Wales for their helpful assistance and the staff at the National Monuments Record (NMR), RCAHMW, Aberystwyth, in particular Medwyn Parry and Penny Icke. The Trust would also like to thank Judith Alfrey, Rick Turner, and Jonathan Berry of Cadw for providing comments and advice during the project. Thanks are also due to Jessica Mills and Philip Hobson at Cadw.

For advice in obtaining information on opencast and reclaimed land, the Trust would like to thank the staff of Unitary Authorities, especially Dave Whetter of Caerphilly CBC's Engineering Division. The Trust would also like to thank Anthea Brown of the British Geological Survey, and David Clarke, Joe Dearden, Graham Martin and Mike Sheldon of the Coal Authority for their assistance. Digital mining information – past opencast site data was kindly provided by the Coal Authority (ref: CA29/03/02). The Trust would like to thank all landowners who gave permission to visit sites on their land, especially the staff at Tower Colliery for their assistance during field work.

The report has been prepared by Richard Roberts, with the assistance of Ellie Graham and other staff of the Glamorgan-Gwent Archaeological Trust, notably Charina Jones, Historic Environment Record Manager. The digital mapping has been prepared by Ellie Graham, Richard Roberts and Paul Jones of the GGAT Illustration Department.

1.3 Copyright Notice

The copyright of this report is held by Cadw: Welsh Historic Monuments and the Glamorgan-Gwent Archaeological Trust Ltd. The maps are based on Ordnance Survey mapping provided by the National Assembly for Wales with the permission of the Controller of Her Majesty's Stationary Office, Crown Copyright. All rights reserved. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence No: 100017916 (2010).

3 Purpose of the Report – aims and applications.

A number of Industrial Iron working landscapes are well known and well protected. Notably the World Heritage Designation at Blaenavon, but some protection is also afforded through inclusion on the Historic Landscape Register at for example Merthyr Tydfil and Cwm Clydach. In other areas only those elements that are Scheduled or Listed are protected and consequently other elements of the landscape relating to the monument are more exposed to removal or impairment through re-development. Industrial landscape reclamation and opencast are considered to be the main threats to these endangered and rapidly disappearing landscapes and their component elements whilst other developments could also have impacts.

It was proposed that the study be initially limited to the northern coalfield rim, specifically those sites described in L Ince 1993 *The South Wales Iron Industry 1750-1885*, Merton Press. The northern coalfield rim supplied 30 major blast furnace iron-producing sites. A simple but valuable exercise comprised comparing evidence from depictions of the core ironwork areas on the first edition OS map with modern maps and aerial photographic material, with the intention of identifying what survives and is visible, what survives and is buried, and what has been destroyed. The boundaries of the initial study were taken as the limits of the core ironworks areas and did not extend to wider transport links, waterworks and associated extraction sites, which were to be covered in the future. Validation was through site visits, consultation with local land reclamation departments and talking to local experts. Each ironworks core area was categorised as archaeologically sensitive areas, areas of archaeological potential or sterile areas. As a separate document a review of the scheduling of these sites could then be undertaken.

Large-scale regeneration proposals, such as the Heads of the Valleys Initiative, represent as much an opportunity as a threat to this existing and as yet largely unquantified heritage resource. Whilst environmental enhancement work is potentially damaging to the archaeological resource, the Heads of the Valleys programme proposes five key strategic goals, the leader of which is ‘an attractive and well-used natural, historic and built environment’, and it is envisaged that this will be achieved through strategic landscape-scale environmental enhancements. A further goal refers to ‘an appealing and coherent tourism and leisure experience’, which would include for large regional-scale projects. There is considerable opportunity for integrated heritage management, and for this reason it has been attempted to tailor the ironworks landscape project to fit the landscape-scale focus of the Heads of the Valleys programme.

Local conservation initiatives, which could allow the industrial monuments to be tied in with ecological protection in amenity developments, offer further example of the potential of proactive management.

Whilst there is this wealth of information Cadw are endeavouring to improve the protection and management of what is perhaps one of the most important aspects of Wales’ history. Cadw would like to see this project attempt at building a consensus and partnership over how to tackle the protection and management issues and assimilate the information gathered into these processes. This may in effect act as a scoping for a larger project to be taken forward in future years.

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The study should ultimately provide the information necessary to:

- assess the current state of survival/preservation, conservation and the recording requirements (of the ironworks landscapes of the northern coal rim)
- inform future protection and management issues, including future scheduling proposals (regarding the ironworks landscapes of the northern coal rim)
- inform the relevant Unitary Authorities on industrial ironworks landscape issues in the planning process, including forward planning
- assist in assessing the wider impact of future proposed development on industrial ironworks landscapes
- assist in the evaluation of the aesthetic or amenity value of the industrial ironworks landscape
- assist in measuring the effect of individual development proposals on the overall historic integrity and coherence of industrial ironworks landscapes, with particular reference to the issues of outright removal, severance, fragmentation or dislocation of the historic elements.
- assess the cumulative effects of secondary or piecemeal changes over time.

An important component of this project has and will continue to be the engagement of those who have a direct interest in the industrial ironworks landscape study and the applications that will be derived from it. It is hoped that this should enable decisions on the protection of the historic environment to be made in a more informed way. It is intended therefore to keep interested parties such as Cadw, RCAHMS, CCW, DEIN, the Local Unitary Authorities, and the Brecon Beacons National Park informed on the progress and findings of the studies.

Several of these objectives are directly applicable to the Heads of the Valleys programme, notably informing authorities on landscape issues, and assisting in the enhancement of the amenity value of sites. In essence the work will help to ensure that any necessary change to industrial ironworks landscape is accommodated without sacrificing the essential integrity and coherence of the historic environment.

The Ironworks were the key stimulant for the development of the surviving communities; as such these are iconic markers in the Welsh industrial landscape. This project aims to provide a deeper understanding and appreciation of these remains leading not just to a better and wider appreciation of their importance as continuing focal points in the South Wales landscape but with the intention that raised awareness and protection can be used as an impetus for sensitive regeneration and community focus.

The results of this project would seek to link into and inform existing strategies such as the 'Wales Spatial Plan' (Welsh Assembly Government 2004) and the related 'Heads of Valleys Strategy' (Welsh Assembly Government 2005), informing the process of promoting and enhancing local heritage sites within a framework of sustainable development. The latter, detailed in the document '*Heads – We Win... A Strategic Framework for the Heads of the Valleys*', (Welsh Assembly Government's vision for the Heads of the Valleys within the context of the Wales Spatial Plan), includes the overarching aim that by '*the year 2020, the [Heads of the Valleys] area will be: a culturally rich, dynamic network of vibrant and safe communities a place where people want to live, work and play with a sustainable, high quality of life and a thriving population helping to drive the success of South East Wales as an internationally recognised Capital Region.*'

Among the key themes of the Heads of the Valleys Programme are the following: ‘An attractive and well-used natural, historic and built environment’, which would provide an ‘appealing and coherent tourism and leisure experience’. The Heads of the Valleys Initiative’s strategic goals and programmes, produced through stakeholder consultation and analysis of the available research and evidence, has been developed around five priority themes, each underpinned by a number of key Strategic Programmes (SPs):

An attractive and well-used natural, historic and built environment

- SP1: A sub-regional approach to the regeneration of settlements
- SP2: A perception-changing landscape
- SP3: Well-used and easily accessed amenities

A vibrant economic landscape offering new opportunities

- SP4: Directly linking people with work
- SP5: Joined-up solutions for business
- SP6: Linked opportunities for businesses and individuals

A well-educated, skilled and healthier population

- SP7: Improving health through prevention
- SP8: Integrated lifelong learning

An appealing and coherent tourism and leisure experience

- SP9: Linked local and regional attractions and facilities
- SP10: An integrated ‘offer’

Public confidence in a shared bright future

- SP11: Visualising the Strategy
- SP12: Pro-active communications and engagement

The following identified strategic programmes SP1, SP2, SP3, and SP9 all have implications for the heritage resource across the Heads of the Valleys region; these should, however, be viewed as opportunities to allow the quantification, assessment, and sensitive management and promotion of the Heritage resource of the Heads of the Valleys area.

The DEIN strategy ‘Working Together For Wales’ is viewed as having the potential to tie in with the broad tourism and regeneration, in addition to ‘urban and rural renewal activities, land reclamation and environmental improvements to sites and property’.

A raft of numerous supporting plans, policies, strategies and guidance exists to underpin the Heads of the Valleys Initiative and are relevant to the future preservation and management of the heritage resource in the Heads of the Valleys area; these have been summarised in ‘Annex A: Review of Relevant Plans, Policies and Strategies’, and include the following: *Environment Strategy for Wales; Learning to Work Differently – Sustainable Development – WDA; Planning Policy Wales (March 2002); Circular 60/96; Circular 61/96; Enter the Dragon Economy – SE Wales Development Strategy (Capital Wales); Wales: A Better Country – The Strategic Agenda of the Welsh Assembly Government.*

4 Methodology

4.1 General Methodology

The project involved a rapid interrogation of the computerised Regional Historic Environment Record (henceforth HER), supplemented by other readily available primary and secondary data, such as a search of National Monuments Record (henceforth NMR) data available through ENDEX, and online through the Coflein website. More general works and articles and other sources were also consulted where readily available, though few secondary sources were found to be directly relevant to the study of water management features; where consulted these sources are provided in the bibliography along with other general sources.

The report has been presented in such a way that upgrading of information can be considered through the medium of a GIS system. This allows data storage, manipulation, analysis, interrogation, presentation and future revision of information. Information Technology has therefore been a major component of this project and the current years work contributes to the production of a dynamic and multi-layered digital model for the study area(s).

4.2 Year Six Methodology

During Year six, as with the previous year, the information gathered from the Heads of the Valleys area-wide mapping exercise based on the first edition 25-inch OS map (LANDMARK Historic Mapping) carried out during the years three and four of the project was refined and confirmed through further map work and field survey. Pilot work undertaken by the Glamorgan-Gwent Archaeological Trust at Ffos-y-Fran, Merthyr Tydfil and by Archaeological Investigations Ltd at Rhyd-y-Car, Merthyr Tydfil provided a useful methodological framework. The Year six study was restricted to one of the valley group landscapes identified during Year four: The Aberdare-Hirwaun corridor and the area to the north of Hirwaun centred on the upper reaches of the Afon Cynon to Penderyn, covering a number of closely spaced Ironworks: Hirwaun; Llwydcoed; Gadlys; and Abernant and their connected landscapes. It was decided to omit the ironworks of Aberaman from the study due to the fact that its core area, and neighbouring extractive landscape had been largely lost to reclamation. During the latter part of year 6 funding was obtained to include the Eastern Valley area, including the extractive areas around Abersychan, the British Ironworks and Varteg, associated with the core ironwork areas of Varteg, Golynos, the British, and Pentwyn ironworks.

The study took the form of more detailed targeted map analysis and regression utilising the first edition 25-inch OS map (LANDMARK Historic Mapping), and other available mapping, ie estate, industrial and Tithe maps, in conjunction with consultation of further detailed aerial photographic material (see Bibliography, below). The digital mapping (polygon and point data) was revised with the level of detail increased (using MapInfo 9). The project also involved interrogation of the computerised regional Heritage Environment Record (HER), relevant data and information held by the RCAHMW (NMR records and the on-line Coflein resource) were also accessed as was up-to-date information on scheduled and listed building held by Cadw, supplemented by other readily available primary and secondary data, including documentary and cartographic sources held at the National Library of Wales (NLW), and Local Record Offices. The searches of the NMR data provided through Endex was augmented by information held on 'Coflein', the RCAHMW's digital web resource. In addition the NMR collection records were also consulted as were aerial photographic sources. Of particular note was the upland survey

data collated as part the RCAHMW's Upland Initiative. More general works and articles and other readily available sources was also consulted (see Bibliography, below).

An element of targeted fieldwork also formed part of the project during the current year; the areas, considered to have the highest potential on the basis of the mapping study undertaken during Year four of the project, were further assessed and specific field visit areas were selected. The field visits allowed the extent, condition and significance of the resource to be further assessed, and allowed the preparation of area and site-specific conservation and management recommendations and scheduling proposals. A proforma, devised during Year five was used for field recording, and the resultant field records transferred later to a database (MSAccess 2000) compatible with the regional HER.

The fieldwork allowed the condition of surviving extractive areas/water management systems visited and the remains within to be noted and their significance to be rapidly assessed. The following condition ratings were devised and used:

A – Intact: well-preserved extraction area/water management system with abundant associated features visible on the surface.

B – Moderately Intact: good condition, occasionally with associated features visible and high potential for buried remains.

C – Damaged: surface features survive in disturbed condition, some potential for buried remains.

D – Substantially Damaged: features survive in a heavily disturbed condition with form and function no longer obvious/feature found to be largely destroyed.

E – Altered: visible remains of feature substantially altered (e.g. sites where substantial renewal or modernisation has occurred)

U – Unknown: unknown surviving potential (e.g. sites inaccessible for survey, i.e. those on private land, hidden by vegetation, or buried).

The overall archaeological significance or potential of the resource was arrived at through considering the following factors, where information was readily available:

- **Rarity** – in terms of period, type, etc
- **Representativeness** – representative range of elements
- **Survival** – percentage survival (areas and systems only)
- **Condition** – overall condition of surviving elements
- **Group Value** – structural/functional coherence of surviving features, but also wider ironwork group value
- **Coherence** – retention of historic meaning and significance
- **Integrity** – survival of original character or form
- **Potential** – potential for future study or analysis
- **Amenity** – potential for development for public educational recreational amenity
- **Association** – to events, figures, technological advancement, or availability of documentary evidence
- **Status** – statutory protection

Given the nature of both extractive and water management features, where direct association is frequently difficult to establish, group value and integrity were frequently the overriding factors used in determining archaeological significance.

The archaeological significance arrived at was allocated one of the following values:

- A – National Significance (A? – Potential National Significance)
- B – Regional Significance
- C – Local Significance
- D – Minor Significance
- U – Unknown/Unestablished

4.3 Task Breakdown

1. Review and compile baseline documentation

- ❑ Compilation of necessary documentation/SMR/NMR data, Cadw Information, etc
- ❑ Obtain, compile, and review mapping material: 1st edition 1:2500 OS and other available historic maps of chosen study area (area c)
- ❑ Compile source list and bibliography for project
- ❑ Review secondary source data against chosen study area.

3. Undertake historical mapping and production of revised detailed area constraint maps

- ❑ Undertake detailed mapping (digital MapInfo point and polygon data)
- ❑ Review and chose areas and features for targeted field visits
- ❑ Undertake targeted field survey visits
- ❑ Produce area and feature descriptions
- ❑ Review general condition and value of surviving remains (based field visit observations, source material and against modern map, aerial photographic data, etc)
- ❑ Revise existing GGAT lists and distribution/area maps

4. Review the assembled data

- ❑ Consider proposals for protection (where identifiable)
- ❑ Revise integrated summary/constraints map including information from earlier years.
- ❑ Discuss conclusions with Cadw

5. Compile and disseminate reports

- ❑ Compile text
 - Briefly review background history of the ironworks of the northern coal rim, historiography, recent research, and significance and importance of individual ironwork landscapes
 - Review relative historical significance and importance of individual ironworks landscapes within chosen study area (ie Area c) based on previous years findings
 - Methodology
 - Introduce areas and features within chosen study area
 - Present results of detailed map regression and aerial photographic exercise
 - Introduce areas and features chosen for targeted field survey work.
 - Set out results of targeted fieldwork within context of detailed background (including map regression) study, and indicate condition and value of identified remains.

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- Review current levels of statutory protection relating to features within chosen study area
- Review threats and current management proposals/priorities relating to features within chosen study area
- Make any additional recommendations, eg proposals for protection (separate report)
- Prepare illustrations for report
- Produce reports using DTP facilities
- Submit reports to Cadw
- Provide copies to interested parties (SMR and NMR, RCAHMW, LPA planning departments, HOVI, DEIN, etc)

5 Industrial Ironworks Landscapes (after year 4 report)

5.1 Review of Project: Year 1 The Core Ironwork Areas

During year one of the Southeast Wales Industrial Ironworks Landscapes project a number of wider ironwork areas, based on the information contained in Ince 1993 and a rapid mapping exercise, including limited map regression, were identified, and defined; these were further revised and core ironwork areas defined, primarily using cartographic and aerial photographic information, more detailed map regression, tied into baseline HER and NMR information. The result was the identification of some 35 core ironworks areas; these are given in table 1, below.

Table 1. Identified core ironworks areas

Ironworks Number ¹	Ironworks Name	Grid Reference
001	Pontypool (Upper Race, Blaendare)	ST 272 997
002	Varteg	SO 265 055
003	Golynos	SO 260 047
004	Abersychan (British)	SO 258 035
005	Pentwyn	SO 265 033
006	Clydach	SO 227 128
007	Blaina (inc. Cwmcelyn)	SO 199 081
008	Coalbrookvale (inc. Trostre)	SO 194 095
009	Nant-y-glo	SO 192 105
010	Ebbw Vale	SO 174 097
011	Victoria	SO 172 076
012	Beaufort	SO 170 115
013	Tredegar	SO 144 091
014	Sirhowy	SO 144 102
015	Rhymney	SO 113 069
016	Dyffryn	SO 071 032
017	Pentrebach	SO 065 035
018	Plymouth	SO 057 048
019	Ynys Fach	SO 046 060
020	Cyfarthfa	SO 037 068
021	Penydarren	SO 058 072
022	Dowlais	SO 065 074
023	Ivor Works	SO 068 080
024	Hirwaun	SN 993 045
025	Llwydcoed	SN 993 045
026	Gadlys	SO 001 031
027	Abernant	SO 006 035
028	Aberaman	SO 015 003
029	Ystalyfera	SN 764 084
030	Ynyscedwyn	SN 785 092
031	Onllwyn	SN 839 103
032	Banwen	SN 868 104

¹ Numbers prefixed by IW in main text

Ironworks Number ¹	Ironworks Name	Grid Reference
033	Melincwrt	SN 824 019
034	Venallt	SN 863 049
035	Abernant	SN 882 063

It was found that historically, many of the ironworks areas had expanded to take in significant areas of valley landscape; this was particularly the case with the larger ironworks conglomerations within the upper valleys of the Blaenau, such as at Nant-y-glo, Ebbw Vale, Rhymney, Blaina, and Coalbrookvale. Conversely, in the case of some of the less significant ironworks, such as the once jointly operated Varteg and Golynos, in the area north of Pontypool between the British Ironworks and Blaenavon, it was found that the constituent parts of the core area were often spread over some distance, with core activities being shared between different sites.

Whilst 35 Ironworks Areas were identified for the purpose of the year one report, the actual number of ironworks was 38, as several ironworks had been combined, because of proximity and development such as IW007 Blaina, which included the Cwmcelyn Ironworks and IW008 Coalbrookvale, which included Trostre Ironworks. It should also be noted that several of the more extensive ironwork areas identified, were out of necessity effectively split up into separate sub-areas. These include Ebbw Vale, which can be sub-divided naturally into three areas, along the lines of the core furnace area, the Lower Mill site, and the Bessemer Steel works, and Rhymney, which comprises the Old Furnace, the main Rhymney Ironworks site itself and the adjacent Bute Works.

The year one project entailed a review of existing protection and identification of potential threats to the resource. In terms of protection fifteen of the core ironwork areas examined were found to have some degree of current statutory protection (ie Scheduled Ancient Monuments or Listed buildings); that is between 40% and 43% of the original resource within the study area limits. The analysis indicated that of the core ironworks areas with visible standing remains, 75% are currently protected to some degree through statutory protection, while just 50% of ironwork areas with buried potential are similarly protected.

The level of statutory protection was further broken down to allow an analysis of the protected resource against surviving monument class (ie furnaces, charging ramps/platforms, calcining ovens/coking oven, casting houses/foundries, rolling mills, engine houses, waterwheels/pits, offices and other buildings), where surviving as visible standing, or positively identified buried remains. This has been specifically undertaken to identify classes of monument that are underrepresented within the current protection regime, but also identify core ironwork areas, which might benefit from the extension of existing protection.

The main features of the ironworks sites are considered to be their furnaces and charging ramps/platforms; sixteen core ironworks areas out of 35 within the study area were found to retain visible standing, or positively identified buried remains of furnaces/furnace banks (including a count of two for Abersychan – with the scheduled air furnace). The nationally important furnaces (and engine house) at Banwen (SAM Gm420), despite protection through scheduling are in urgent need of conservation. Twelve of the 17 furnaces/furnace banks identified are currently protected by statutory protection: notably the furnace bank at IW010 Ebbw Vale (Listed Building Grade II*, Cadw ref: 22,531) is not scheduled. The furnaces at

IW004 Abersychan, IW029 Ystalyfera, IW022 Dowlais (buried) and IW018 Plymouth (buried) are also of particular significance and are currently unprotected through legislation. The number of charging ramps/platforms similarly protected mirrors the figures identified for furnaces with 11 protected out of 18 identified, with that at IW010 Ebbw Vale listed (LBII*, Cadw ref: 22,531) but not scheduled. Significant unprotected charging ramps/platforms survive at IW029 Ystalyfera, IW004 Abersychan, IW021 Penydarren, and possibly also at IW009a Nant-y-glo. Other unprotected remains of charging ramps/platforms might also survive at IW012 Beaufort, IW013 Tredegar and IW025 Llwydcoed.

The survival and protection of ancillary features displayed a slightly different pattern to the main ironworks features; in general survival of ancillary features within the study area such as calcining ovens/coking ovens, casting houses and foundries, was found to be relatively low and where these features did survive they were, with a few exceptions, invariably protected. Remains of calcining ovens/coking ovens survive at five ironworks, though generally in a fragmentary or buried condition. Of the calcining ovens/coking ovens identified four are protected through legislation; that at IW026 Gadlys, which had recently been conserved, was listed (LBII, Cadw ref: 10,846), but not scheduled. The latter in terms of condition was the best surviving example of those within the study area; most remain as 'sites of', or buried. Of the five ranks of ovens originally located at IW004 Abersychan, one recorded in 1994 (Ironbridge Institute and RCAHMW 1994) survives apparently in poor condition (Riden 1994); the site is currently unprotected.

Casting houses/foundries were identified within five ironwork core areas; all are currently protected through legislation. The only unscheduled example is the foundry at IW004 Abersychan, which is a grade II* listed building (Cadw ref: 14,870). Mills and forges are similarly well-protected: these include both the forge/workshop (occupied) at IW015 Rhymney a grade II listed building (Cadw ref: 16,882), and the remains of two possible mills within the scheduled area (SAM BR157) at IW024 Hirwaun. Unusually the well-conserved brick-built mill/engine house and adjacent chimney (NPRN 34,037) at IW030 Ynyscedwyn is as yet unprotected through statutory legislation.

The level of protection afforded to surviving ironworks related engine houses is generally high with eight of the ten identified examples adequately protected through listing and scheduling. Those Engine houses, which are listed rather than scheduled (eg Grade II* Listed engine house at IW019 Ynys Fach, and the Grade II Listed examples at IW022 Dowlais and IW026 Gadlys) are occupied and have been found alternative uses. As yet unprotected, in addition to the aforementioned example at Ynyscedwyn, are the buried remains of two identified engine houses at IW010 Ebbw Vale; these located to either end of the grade II* listed furnace. Only three waterwheels/wheel pits have been identified within the study area; these are all protected through scheduling; one at IW014 Sirhowy also being grade II* listed (Cadw ref: 22,496). It should be noted that due to the nature of these features a strong likelihood exists that buried remains might survive elsewhere, as yet unknown.

Of the twenty or so miscellaneous features such as offices and other buildings identified five are currently unprotected by legislation. The more significant are the tramroad tunnel beneath the furnace bank at IW018 Plymouth, the weighbridge and weighbridge house, and the smithy and carpenter's shop at IW032 Banwen, the Company shop/office at IW009 Nant-y-glo (within 009a), the office at IW027 Abernant, and the Company shop and offices at IW034 Venallt; the latter three sites are all now occupied domestic properties. The unprotected features at Banwen

have considerable group value with the nationally important features within scheduled area to the north (SAM Gm420), and it was noted that protection should be considered.

A review of identified threats undertaken during year one using Unitary Authority development plans as a basis. Other potential threats, mainly from dereliction were identified in particular from the site visits.

The year one project included rapid site validation visits; in fact a cross-section of ironworks (nineteen of the thirty-five) within the study area was visited, with the exception of the Merthyr Tydfil area (previously covered by Historic Landscape Characterisation work). The site visits in conjunction with documentary and cartographic sources were undertaken to validate the ironwork boundaries in their current state and to establish the current condition/survival, potential for survival of the archaeological resource within the identified ironwork areas.

The archaeological resource for each ironwork core area was assessed in relation to the level of current statutory protection as well as condition, archaeological value, presence of visible remains and buried potential. It was found that of the 35 core ironwork areas (ie or a maximum 38 ironworks) 21 retained visible remains, while 30 were considered to have some level of buried potential. The results are summarised in Table 2, below.

Table 2. The core ironworks areas: condition and archaeological value

Ironworks Number	Ironworks Name	General Condition of Site ²	Archaeological Value (Grading on figures)
001	Pontypool (Upper Race, Blaendare)	Reclaimed and landscaped	C
002	Varteg	Cleared and landscaped	C
003	Golynos	Reclaimed and partly redeveloped	C
004	Abersychan (British)	Intact (SAMs/LBs)/partly buried	A
005	Pentwyn	Reclaimed and landscaped	C
006	Clydach	Intact (SAM/LBs)/cleared and partly redeveloped	A
007	Blaina (inc. Cwmcelyn)	Reclaimed and redeveloped	C
008	Coalbrookvale (inc. Trostre)	Reclaimed and redeveloped	C
009	Nant-y-glo	Intact (009b: LB)/cleared and redeveloped	A-B
010	Ebbw Vale	Intact (LB)/partly cleared and redeveloped	A-C
011	Victoria	Reclaimed and partly redeveloped	C
012	Beaufort	Cleared and redeveloped	C
013	Tredegar	Cleared and partly redeveloped	C
014	Sirhowy	Intact (SAM/LB)/partly buried	A
015	Rhymney	Intact (015a: SAM/LBs)/reclaimed and redeveloped	A-C
016	Dyffryn	Reclaimed and redeveloped	C
017	Pentrebach	Reclaimed and redeveloped	D
018	Plymouth	Tunnel intact/rest reclaimed and	A

² Based on cartographic, documentary and aerial photographic evidence alone, where not visited.

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		partly redeveloped	
019	Ynys Fach	Intact (SAM)/partly cleared and redeveloped	A
020	Cyfarthfa	Intact (SAMs/LBs)/ partly cleared	A
021	Penydarren	Cleared and redeveloped	B
022	Dowlais	Intact (LB)/partly reclaimed and redeveloped	A
023	Ivor Works	Intact (LB)/cleared site redeveloped	A
024	Hirwaun	Intact (SAMs/LBs)/partly cleared	A
025	Llwydcoed	Intact?/partly cleared	A
026	Gadlys	Intact (SAMs/LBs)/partly cleared and redeveloped	A
027	Abernant	Cleared and partly reclaimed	C
028	Aberaman	Cleared and reclaimed	D
029	Ystalyfera	Partly cleared and redeveloped	A/B
030	Ynyscedwyn	Partly cleared and redeveloped	A/B
031	Onllwyn	Opencasted and reclaimed	D
032	Banwen	Intact (SAM)/derelict state	A
033	Melincwrt	Intact (SAM)/derelict state	A
034	Venallt	Intact (SAM)/conserved	A
035	Abernant	Reclaimed/partly redeveloped	D

The analysis of cartographic, documentary and aerial photographic material not only allowed the boundaries of the core ironworks areas to be identified, but also allowed a general overview of site condition to be established. In this way the archaeological significance or potential of the resource could be estimated and broken down into the following:

- archaeologically sensitive areas - Grade A
- areas of archaeological potential (moderate-high) - Grade B
- areas of archaeological potential (low-moderate) - Grade C
- sterile areas/low potential - Grade D

The value of the remains in the individual ironworks (IW) areas was considered in terms of certain remains, or where not visible, potential.

Of the 35 core ironworks areas examined during year one some 14 (40% of the total areas) were considered to be straight archaeologically sensitive areas, with an additional 5 (14.3% of the total) archaeologically sensitive in combination (Category A taking president), a single area of moderate-high archaeological potential (2.9% of the total), and 11 areas (31.4% of the total) of low-moderate archaeological potential, whilst the remainder were areas of low or sterile archaeological potential. Of these core areas, only those considered to be archaeologically sensitive or of moderate to high potential have been viewed as considerations, when identifying historic ironworks landscape areas (see section 7.3, below).

5.2 Review of Project: Year 2 Transport Networks

Between the 1790s and 1840s the Heads of the Valleys in particular was the largest producer of iron in Britain, if not the world. A major system of tramroads and railroads was developed to furnish the ironworks with raw materials; this system, with the possible exception of the North

Eastern Coalfield of England, was 'by far the most extensive in Britain and therefore the World' (van Laun 2001). The transport networks of South Wales were notable for a number of important technological advancements, such as the first use of the all-iron edge rail, and here the tramroad was developed to its highest form, with implications for the later development of public railways.

Three major components of the ironworks related transport system were identified:

- the supply lines which extended from the limestone quarries of the northern outcrop to the furnaces (c.100km overall length)
- the supply lines which conveyed coal from the coal and iron ore mines, which generally lay closer to the ironworks than the quarries (comprising a vast network of underground track)
- the exit lines from the ironworks to the ports and canals and nearby markets (originally c. 190km)

The best surviving of these routes were the feeder routes from the limestone quarries, these were considered by van Laun (2001b) to be the most productive for further archaeological research; the routes to the coal and iron ore mines being largely underground or inaccessible, having been tipped over by continued workings or removed by land reclamation and urban development, whilst the exit routes have by and large been obscured by later railways, and road development with the notable exception of the Merthyr Tramroad, which has been excluded from the current study. It was considered that any meaningful examination of the routes to the coal and iron ore extraction sites would have required a substantial amount of desk-top study and original research, which whilst being beyond the scope of the project would have been largely unproductive, and as a result year two Southeast Wales Industrial Ironworks Landscapes project concentrated on identifying and investigating the best surviving element of the ironworks' related transport networks, the supply lines from the limestone quarries.

The year two study was necessarily fieldwork orientated to allow the presence/absence of surviving remains along the various transport routes (i.e. of the main routes and branches) to be recorded with each surviving transport route subdivided according to condition; condition ratings were devised and used in relation to the overall condition of each section, as was the overall archaeological significance or potential of the resource on a network-by-network basis and allocated one of the following values:

- High
- Medium
- Low
- Unknown

Of the forty-three transport networks and branches ten, that is only 4.3%, were found to have routes surviving to 50% or more of their original length. In terms of overall archaeological significance twelve networks and branches were considered to be of high overall archaeological significance, six of high-medium significance, whilst the remainder were considered to be of medium, medium-low, low, or unknown significance. Those transport networks and branches with a high or high-medium overall significance rating were further assessed for possible consideration for future protection (i.e. scheduling).

Table 3. Ironworks transport networks giving condition and archaeological value/significance and associated ironwork core areas

Ironworks Transport Number ³	Transport Network Name	Condition Rating	% Overall Survival	Overall Archaeological value	Associated Ironworks: Number(s)/Name(s)
IWT001	Abersychan Limestone Railway	IWT001(i): D IWT001(ii): A	55%	High	IW004 Abersychan (British)
IWT002	Llam-march Railroad	IWT002(i): B IWT002(ii): D	11%	High-Medium	IW006 Clydach
IWT002a	Llam-march Railroad (Waunllapria)	IWT002a(i): B	4%	Medium-Low	IW006 Clydach
IWT003	Llam-march Tramroad	IWT003(i): B IWT003(ii): D IWT003(iii): A IWT003(iv): B IWT003(v): A	35%	High	IW006 Clydach
IWT003a	Llam-march Tramroad Pen-Ffyddlwn	IWT003a: D	0%	Low	IW006 Clydach
IWT004	Clydach Railroad	IWT004(i): B IWT004(ii): C IWT004(iii): B IWT004(iv): E IWT004(v): E IWT004(vi): C	20%	High-Medium (includes: listed tramroad bridge 23837)	IW006 Clydach, IW012 Beaufort
IWT005	Bailey's Llangattock Tramroad	IWT005: D	<1%	Low	IW009 Nant-y-glo, IW012 Beaufort: 2nd Llangattock Tramroad
IWT006	Disgwylfa Main Tramroad	IWT006(i): D IWT006(ii): B IWT006(iii): D IWT006(iv): B IWT006(v): C IWT006(vi): B IWT006(vii): C IWT006(viii): B IWT006(ix): A IWT006(x): B	100%	High	IW009 Nant-y-glo, IW007 Blaina

³ Numbers prefixed by IWT in main text.

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Ironworks Transport Number ⁴	Transport Network Name	Condition Rating	% Overall Survival	Overall Archaeological value	Associated Ironworks: Number(s)/Name(s)
IWT006a	Disgwylfa Pant Draenog	IWT006a(i): B	100%	High	IW009 Nant-y-glo, IW007 Blaina
IWT006b	Disgwylfa East	IWT006b(i): B	100%	High.	IW009 Nant-y-glo, IW007 Blaina
IWT006c	Disgwylfa West	IWT006c(i): B IWT006c(ii): A IWT006c(iii): A IWT006c(iv): A	94%	High	IW009 Nant-y-glo, IW007 Blaina
IWT006d	Disgwylfa Main (conjectured)	IWT006d: D	0%	Low	IW009 Nant-y-glo, IW007 Blaina
IWT006e	Disgwylfa Main (south)	IWT006e(i): A IWT006e(ii): B IWT006e(iii):B	9%	High-Medium	IW009 Nant-y-glo, IW007 Blaina
IWT007	Trevil Railroad Main Line	IWT007(i): A IWT007(ii): E IWT007(iii): A IWT007(iv): E IWT007(v): B IWT007(vi): B	61%	High	IW014 Sirhowy, IW012 Beaufort, IW010 Ebbw Vale with Victoria Ironworks: Rassau Railroad
IWT007a	Trevil Railroad Beaufort Line	IWT007a: D	<1%	Low	IW012 Beaufort: Rassau Railroad
IWT007b	Trevil Railroad Ebbw Vale Line	IWT007b: D	<1%?	Low	IW012 Beaufort, IW010 Ebbw Vale: Rassau Railroad
IWT007c	Trevil Railroad Sirhowy Line	IWT007c: D	0%	Low	IW014 Sirhowy: Rassau Railroad
IWT007d	Trevil line to Victoria	IWT007d: D	0%	Low	IW010 Ebbw Vale, IW011Victoria: Beaufort Tramroad
IWT008	Rassau Railroad	IWT008(i): E IWT008(ii): E	14%	Low-Medium	IW012 Beaufort, IW014 Sirhowy, IW010 Ebbw Vale
IWT009	Hall's Trevil Tramroad	IWT009(i): B IWT009(ii): C	7%	Medium-Low	IW015a Rhymney Upper Furnace: Rhymney Branch Tramroad; Bryn Oer Tramroad
IWT010	Rhymney Tramroad Branch	IWT010(i): U	3%	Unknown	IW015a Rhymney Upper Furnace
IWT011	Morlais East Tramroad and Railway	IWT011(i): B IWT011(ii): D IWT011(iii): E	39%	High-Medium	IW023 Ivor works and IW022 Dowlais Ironworks.

⁴ Numbers prefixed by IWT in main text.

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Ironworks Transport Number ⁵	Transport Network Name	Condition Rating	% Overall Survival	Overall Archaeological value	Associated Ironworks: Number(s)/Name(s)
IWT012	Morlais West Tramroad	IWT012(i): C IWT012(ii): A IWT012(iii): E	34%	High	IW021 Penydarren Ironworks and tramroad, IW018 Plymouth Ironworks
IWT013	Tappendens' Tramroad	IWT013(i): A IWT013(ii): B IWT013(iii): B IWT013(iv): C IWT013(v): U IWT013(vi): E IWT013(vii): E IWT013(viii): C IWT013(ix): A	29%	High	IW024 Hirwaun, IW025 Llwedcoed, IW027 Abernant, IW026 Gadlys
IWT013a	Tappendens' Tramroad West	IWT013a(i): C IWT013a(ii): C IWT013a(iii): C IWT013a(iv): U IWT013a(v): B	16%	Medium	IW024 Hirwaun, IW025 Llwedcoed, IW027 Abernant, IW026 Gadlys
IWT014	Mr Glover's Railroad	IWT014(i): A IWT014(ii): E IWT014(iii): B	65%	High	IW024 Hirwaun (later connection to IW025 Llwedcoed, IW027 Abernant, IW026 Gadlys Ironworks via Tappendens' Tramroad)
IWT014a	Mr Glovers Railroad Bryngwyn Extension	IWT014a(i): B	6%	Medium-Low	IW024 Hirwaun (later connection to IW025 Llwedcoed, IW027 Abernant, IW026 Gadlys Ironworks via Tappendens' Tramroad)
IWT015	Twynau Gwynion Tramroad Line 1	IWT015(i): C IWT015(ii): B	25%	High-Medium	IW022 Dowlais
IWT015a	Twynau Gwynion Tramroad line 2	IWT015a(i): D IWT015a(ii): C IWT015a(iii): C IWT015a(iv): D IWT015a(v): C IWT015a(vi): C IWT015a(vii): B	50%	High-Medium	IW015a Rhymney Upper Furnace

⁵ Numbers prefixed by IWT in main text.

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Ironworks Transport Number ⁶	Transport Network Name	Condition Rating	% Overall Survival	Overall Archaeological value	Associated Ironworks: Number(s)/Name(s)
IWT015b	Twynau Gwynion Tramroad line 3	IWT015b(i): C	87%	Medium	IW022 Dowlais (partly under later Rhymney Limestone Railway)
IWT015c	Twynau Gwynion Tramroad Line 4	IWT015c(i): B IWT015c(ii): U	19%	Medium	IW022 Dowlais (partly under route of Rhymney Limestone Railway)
IWT016	Rhymney Limestone Railway	IWT016(i): E IWT016(ii): B	29%	Medium	IW015 Rhymney Lower Furnace
IWT017	Bryn Oer Tramroad	IWT017: D	0% (within Glamorgan – Gwent)	Low	IW015/015a Rhymney (via Hall's Trevil Tramroad)
IWT018	Tredegar Tramroad	IWT018(i): B	4%	Low	IW013 Tredegar Ironworks
IWT019	Ebbw Vale Private Line	IWT019(i): B	2%	High (includes listed causeway and tunnels 22532).	IW010 Ebbw Vale and IW014 Sirhowy Ironworks
IWT019a	Ebbw Vale Private line addition	IWT019a: D Only a tunnel (IWT019a/001) under Beaufort road survives.	<1%	Low	IW010 Ebbw Vale and IW014 Sirhowy Ironworks (via Harford's Tunnel)
IWT020	Bute Tramroad	IWT020: D	0%	Low	IW015 Rhymney Lower Furnace (via Dowlais' Twynau Gwynion line 4)
IWT021	Beaufort Tramroad	IWT021: D	0%	Low	IW012 Beaufort and IW010 Ebbw Vale
IWT022	Protheroe's Tramroad	IWT022(i): B IWT022(ii): U	26%?	High (IWT022(i) is protected within Scheduled Ironworks Area GM423).	IW034 Venallt
IWT022a	Venallt Tramroad	IWT022a: D	0%	Low	IW034 Venallt
IWT023	Banwen Quarries Tramroad	IWT023(i): U IWT023(ii): D	33%	Unknown (On private land)	IW032 Banwen
IWT023a	Banwen Coelbren Junction	IWT023a(i): B IWT023a(ii): B	87%	High-Medium	IW032 Banwen

⁶ Numbers prefixed by IWT in main text.

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Ironworks Transport Number ⁷	Transport Network Name	Condition Rating	% Overall Survival	Overall Archaeological value	Associated Ironworks: Number(s)/Name(s)
IWT024	Ystalyfera	IWT024: D	0%	Low	IW029Ystalyfera
IWT025	Nant-y-glo - Beaufort	IWT025: D	0%	Low	IW012 Beaufort (also IW009 Nant-y-glo via Bailey's Llangattock Tramroad)

The results of year two of the project allowed the archaeological resource (based on condition, archaeological value, presence of visible remains and buried potential) to be assessed in relation to the level of current statutory protection (i.e. Scheduled Ancient Monuments and Listed Buildings) for each ironwork transport network. It was found that of the 25 ironworks associated transport networks (or a maximum 44 branches) examined during the course of fieldwork, 20 networks (or 33 branches) retained visible remains, of these, 14 (18 branches) were considered to contain sections of high or high-medium archaeological significance.

Nine Scheduled Ancient Monument areas were found to be directly relevant to the study, while a further 12 listed interests, two of which were Grade II* listed, were also visited during the course of the fieldwork. The overriding majority of features currently scheduled or listed along the length of the transport networks surveyed were found with few exceptions to be tramroad bridges or features in association with bridges.

Seven of the transport networks surveyed (10 sections by condition) were found to have some degree of current statutory protection (i.e. Scheduled Ancient Monuments or Listed buildings). The extent of the scheduled resource was considered to be clearly under representative in terms of quantity and variety of transport monument type. Previous scheduling had concentrated on individual features, rather than viewing the networks as a series of interconnected features, and the protected resource had been largely restricted to one particular type of monument (ie. tramroad bridges) almost to the complete omission of others (e.g. tramroad cuttings, revetment, groups of blocks, etc).

The overall archaeological significance of the surviving resource was used to identify the transport networks and branches, which might benefit from further protection. It was found that the linear nature of the resource, and inherently lower value of individual elements, required a different approach to the traditional 'site' based approach when identifying elements of the resource for the purpose of protection. It was felt that a broader landscape approach was necessary to prevent further under representation of some of the less impressive site types, emphasizing the connectivity of the resource through group value, coherence and integrity in particular. The surviving resource had been previously subdivided into sections based on general condition, and group value, among others; these sections were used as the basis for recommending consideration for protection, rather than individual elements.

Ten ironworks transport networks and their branches, some 16 sections, were identified as satisfying the criteria sufficiently to be considered for future protection.

⁷ Numbers prefixed by IWT in main text.

The year two works extended to a review of threats largely identified on the basis of available Unitary Authority development plans. Other potential threats, such as dereliction were identified from the site visits. As a result general conservation management recommendations were made for the surviving networks. This identified a need for future detailed survey for many of the networks, or parts thereof; 17 sites were sufficiently well preserved, or complex, to warrant recommendations for further detailed survey (possibly to include trial excavation).

5.3 *Review of Project: Year 3 Water Management Features*

The project study area was revised during year 3 to reflect that of the Heads of the Valleys Initiative, in addition to areas considered to be well-covered by previous studies, such as the Blaenavon World Heritage site, and Merthyr Tydfil UA, the area of Cwm Clydach to the east and the iron working areas of the upper Swansea and Neath Valleys were also excluded.

With a few notable exceptions on the systems within Ebbw Vale and Merthyr Tydfil (mostly outside the study area), previous work on the water management component of industrial ironworks landscapes within the Heads of the Valleys Initiative area has been limited:

- The RCAHMW (Malaws and Wakelin 1993; Percival 2004) and GGAT (Roberts 1997b, 2001 and 2002; Roberts and Lawler 2003) have carried out survey and other work on the Dowlais Free Drainage System, parts of which have been scheduled as an Ancient Monument. This is ‘a gravity-fed drainage’ system, which supplied water to the ironworks of the Dowlais area including the Ivor (Ifor), “Old” and Penyardren Works (Owen 1977). Other more general work has been published on the water supply system for the iron and steel works of Merthyr Tydfil (e.g.Gross 2001).
- Elsewhere in Merthyr Tydfil assessment work has been carried out on the water system associated with Cyfarthfa and its mineral field on the western side of Merthyr Tydfil (see Roberts 1997; Williams 1997; Frost & Scott Jones 2000; and Oakey and van Laun 2004).
- Archaeological Investigations Ltd undertook an assessment on the drainage system of Ebbw Vale/Glyn Ebwy in Blaenau Gwent (Oakey 2005) with particular emphasis on four reservoir sites: Long Feeder Pond, Guide Mill Pond, and Rhyd-y-blew Reservoir in Ebbw Vale, and Farmers Pond in Bryn Mawr. This work included detailed analysis of the documentary evidence, and provides a developmental history and has mapped much of the system.

The work carried out during Year 3 of the project identified 101 water management related features (81 HER and 20 NMR sites) from searches of the HER and NMR within the revised study area, of these registers, 67 were associated directly or indirectly to ironworks (with an additional four possibly related). Only one water management ironworks related feature within the revised study area was found to be protected through statutory legislation, the Colliery Pumping Engine House (MM216) at the British Ironworks (both a Scheduled Ancient Monument and a listed building).

A rapid review of the first edition OS map effectively increased the baseline data allowing the identification of 601 water management features (including 563 previously unidentified sites), which were subsequently mapped as point, linear and polygon data. These features were subsequently divided into ‘systems’ on a valley-by-valley basis, with the larger water

management features (i.e. reservoirs and leats) used as indicators against which the survival and hence potential archaeological significance of each system could be measured. Archaeological survival values for water management features identified from the first edition OS maps were given as follows:

- A: Intact (original condition) - High Value (not assigned)
- B: Surviving (condition unestablished) - Moderate-High Value
- U: Potentially Surviving (ie buried or drained state) - Unknown Value
- D: Destroyed - Low Value

The analysis of cartographic, documentary and aerial photographic material in conjunction with a comparison of data on opencast land-take from the coal authority allowed a general overview of potential for site survival to be established. Of the 601 water management features identified from first edition OS maps, potential related to ironworks and assessed in terms of potential survival, 161 features were found to survive in a condition, as yet to be established, with approximately 176 additional water management features having the potential to survive in a buried or drained state, whilst 223 were found to have been lost to development such as opencast and urban/infrastructure development. This would indicate that approximately between 27% and 56% of the overall resource has the potential to survive.

Table 4. Water management systems in relation to individual ironworks using reservoirs and leats (survival value B only) as indicators of survival

Ironworks Number	Ironworks Name	Ironworks: archaeological potential	Surviving Reservoirs	Reservoirs: visible survival rating	Surviving Leats	Leats: visible survival rating	Combined survival rating
IW002	Varteg	C	1	20%	0	0%	8%
IW003	Golynos	C	0	0%	1	33%	17%
IW004	British	A	1	17%	1	25%	20%
IW005	Pentwyn	C	0	0%	0	0%	0%
IW007	Blaina	C	4	33%	1	14%	26%
IW008	Coalbrookvale	C	3	75%	4	80%	78%
IW009	Nant-y-glo	A/B	10	29%	20	53%	42%
IW010	Ebbw Vale	A/C	5	20%	4	17%	18%
IW011	Victoria	C	3	33%	2	18%	25%
IW012	Beaufort	C	2	20%	4	44%	32%
IW013	Tredegar	C	9	33%	18	86%	56%
IW014	Sirhowy	A	4	16%	4	29%	21%
IW015	Rhymney	A/C	7	33%	21	54%	47%
IW024	Hirwaun	A	4	44%	6	50%	48%
IW025	Llwydcoed	B	1	33%	6	100%	78%
IW026	Gadlys	A	0	0%	2	100%	100%
IW027	Abernant	C	0	0%	3	50%	25%
IW028	Aberaman	D	0	0%	0	0%	0%

The visible surviving water management features (survival value B only) in relation to individual ironworks indicates that 77.8% of the 'systems' relating to individual ironworks survive to less than 50% of their original extent. Indeed from the results it is clear that there is little useful correlation to be made between good surviving ironwork core areas and areas of good survival of

water management features; the highest combined survival ratings, eg water management features associated with Llwydcoed and Gadlys, generally relate to a small and relatively insignificant original resource.

Table 5. Assessment of water management systems using reservoirs and leats as indicators of survival

Water Management Valley System	Totals	Reservoir Value B	Reservoir Value U	Leat Value B	Leat Value U
Eastern Valley (Cwm Sychan and Cwm Ffrwd)	Valley System Total: Score	15		15	
	Valley System Surviving: Score	2	11	2	6
	Valley System Percentage Surviving	13.3%	73.3%	13.3%	40%
	Maximum Potential Surviving Value	86.6%		53.3%	
Nant-y-glo and Ebbw fach	Valley System Total: Score	50		50	
	Valley System Surviving: Score	17	9	25	5
	Valley System Percentage Surviving	34%	18%	50%	10%
	Maximum Potential Surviving Value	52%		60%	
Beaufort and Ebbw Vale	Valley System Total: Score	44		44	
	Valley System Surviving: Score	10	5	10	13
	Valley System Percentage Surviving	22.7%	11.4%	22.7%	29.5%
	Maximum Potential Surviving Value	34.1%		52.3%	
Sirhowy and Tredegar	Valley System Total: Score	52		35	
	Valley System Surviving: Score	13	8	22	1
	Valley System Percentage Surviving	25%	15.4%	62.9%	2.9%
	Maximum Potential Surviving Value	40.4%		65.7%	
Rhymney	Valley System Total: Score	21		39	
	Valley System Surviving: Score	7	4	21	6
	Valley System Percentage Surviving	33.3%	19.1%	53.9%	15.4%
	Maximum Potential Surviving Value	52.4%		69.2%	
Cynon with the Dare and Aman	Valley System Total: Score	22		28	
	Valley System Surviving: Score	5	7	17	<4
	Valley System Percentage Surviving	22.7%	31.8%	60.7%	<14.3%
	Maximum Potential Surviving Value	54.6%		<75%	

The results of the analysis identified that no water management systems survive in their entirety within the study area, whilst five out of the six systems survive to around 50% of their original extent, with the notable exception of the smaller system at Cwm Sychan and Cwm Ffrwd which had a maximum potential surviving score of 86.6% based on its reservoirs.

The project allowed for a brief description of the respective valley systems and made conservation/management recommendations. The level of available study undertaken for water management features in general is low, with the exception to an extent of the Dowlais free drainage system, parts of the systems, which supplied Cyfarthfa and Ebbw Vale. Whilst the study allowed a rapid establishment of baseline data across the Heads of the Valleys area, it was by its very nature limited, for this reason follow on detailed documentary work and targeted field survey are among the recommendations made.

5.4 *Review of Project: Year 4 Extraction Areas*

During Year 4 of the project the extractive areas associated with the ironworks were mapped and rapidly assessed for potential survival. Initial searches of the HER and NMR identified 351 and 294 extractive features respectively within the revised study area, not all necessarily related to ironworks. Additional NMR data came to light following the production of the Year 4 report; this included details of upland survey carried out in 2005 on behalf of the RCAHMW within the area north of Bryn Mawr. This additional data has been incorporated within the current year's project.

It was found that was not possible to effectively confirm the relationship of the identified HER and NMR resource either directly, or indirectly to ironworks related extraction. Most of the available site information was found to be of an insufficient level to allow relationships with ironworks to be definitely established, however, tramroad links and close proximity to core ironwork's areas was used as an approximate minimum indication. In this way at least 124 HER and 184 NMR registers within the study area were considered to relate directly or indirectly to ironworks.

The statutory protected archaeological resource (ie Scheduled Ancient Monuments and Listed Buildings) for extractive related features within the study area (i.e. Heads of the Valleys Initiative area excluding Merthyr Tydfil and Blaenavon World Heritage site) was limited to only seven Scheduled Ancient Monuments (SAMs), and seven Listed Buildings (LBs). Of the 7 extraction related SAMs four were considered ironworks related: Cwmbyrgwm Colliery (MM163); Clydach Coal Level (MM264); British Colliery Pumping Engine House (MM216), and Trefil Quarries North (MM338). Of the 7 extraction related listed buildings only two, both listed grade II, were found to be directly related to ironworks' extraction, these were the Colliery Ventilation Furnace at Llandafal (15836), and the British Colliery Pumping Engine House (14869).

To increase the level of available baseline data across the Heads of the Valleys area the project utilised rapid mapping of extractive areas identified from the first edition OS map as a first step. In addition readily available data on the coal workings of the Cynon Valley was extracted from the Table of Mines (Davies/Godsall list) presented as an Appendix in the Cynon Valley History Society's publication Cynon Coal (Cynon Valley History Society 2001 Appendix A 199-244). The latter identified a further 66 interests, including levels, collieries, pits, patch workings, and drift workings.

The mapping of extractive areas identified from the 1st edition OS maps produced 156 digital polygon areas of varying sizes, of these 119 were further identified as being potentially related to ironworks due to proximity and tramroad/rail links. On further analysis 27 of the 119 were

found to have been lost in entirety to development (eg through opencast and urban/infrastructure development), though some 96 of the extractive areas were found to survive to an extent, whilst 45 extractive areas had areas, which potentially survived. Given the great disparity between the areas' sizes, analysis of the surviving resource was only made in relation to surviving physical area. Full details are available in the Year 4 report.

The analysis of cartographic, documentary and aerial photographic material in conjunction with a comparison of data on opencast land-take from the coal authority allowed a general overview of potential for area survival to be established. As the methodology employed a rapid review of recent large scale aerial photographic material rather than field survey it was only possible at this stage to use the existence of large features (ie tips) visible on aerial photographs as an indication of survival.

The following archaeological significance criteria was used through establishing associations with previously identified and protected extractive sites as follows:

- A: Surviving (with associated SAMs LBs) - High value
- B: Surviving (with associated NPRNs/PRNs) - Moderate-High value
- C: Surviving (without associated registers) - Low – High value
- U: Potentially Surviving (condition unestablished from AP search) - Unknown value
- D: Destroyed - No or limited value

Given that the methodological scope of the project it should be noted that the archaeological significance values assigned to each of the individual extractive areas were indicative at this stage and likely to be further revised as the project progresses. At this stage the results helped to establish known and potential significance and area survival, and thereby identified areas, which would repay further investigation.

The extent of survival, or potential survival, of ironworks extractive areas (based on comparison of recent aerial photographs and the areas of potential ironworks related extraction identified from the 1st edition OS mapping) has been worked out in terms of area and percentage survival of the original extractive area. An original baseline resource of around 4401.23 ha in total of ironworks related extractive land. Less than half of the original area of extractive land identifiable from the 1st edition OS as potentially being related to ironworks extraction was found to survive to the present day. The analysis of the data in relation to surviving and potential surviving extractive areas established that the surviving resource lay in the region of 1705.74 ha (comprising a total area of 1411.22 ha of surviving extractive land and 297.71 ha potential surviving extractive land), that is 38.81% of the overall original area resource.

The results indicated that despite some complete losses, a considerable area of potential iron working extractive landscapes survives within the study area. The majority potential ironworks related extractive areas retained between 25% and 100% of their original areas, landscapes, with a corresponding high incidence of 'A' and 'B' Category areas (reflecting incidence of protected and other identified related interests) in particular, adding to the potential significance of the resource.

The initial results indicated that sufficient potentially survives of the resource to allow an understanding of the ironworks' related extraction areas, a formerly important characteristic of

the industrial ironworks landscapes, and that further detailed documentary and field based work is required to confirm the full extent, condition and value of the surviving resource.

In an attempt to identify the most ‘coherent’, of the surviving ironworks extractive landscapes, and not necessarily the largest, the individual extractive areas were grouped together on a valley-by-valley basis, as used for water management features in year 3 of the project.

The project also assessed the maximum extent of survival of ironworks extractive landscapes in terms of area and percentage survival of the original extractive area resource on a valley-by-valley basis; this is presented in Table 6, below.

Table 6. Estimated valley area survival as a percentage of the original valley area resource identified from first edition OS maps categorised by extractive landscape based on combined extractive areas within valley groupings

Extractive Valley Landscape: Ironworks Number and Name	Extractive area on 1st edition OS map (Sq km)	Area surviving (Sq km)	Area potentially surviving (Sq km)	Total area surviving (Sq km)	Maximum percentage area surviving
Eastern Valley (Cwm Sychan and Cwm Ffrwd): IW002 Varteg; IW003 Golynos; IW004 British; IW005 Pentwyn	3.019	2.241	0.025	2.266	75.06%
Nant-y-glo and Ebbw fach: IW007 Blaina; IW008 Coalbrookvale; IW009 Nant-y-glo	6.850	3.532	0.134	3.666	53.52%
Beaufort and Ebbw Vale: IW010 Ebbw Vale; IW011 Victoria; IW012 Beaufort	5.437	0.973	0.233	1.206	22.18%
Sirhowy and Tredegar: IW013 Tredegar; IW014 Sirhowy	4.327	0.8479	0.8767	1.725	39.87%
Rhymney: IW015 Rhymney	6.959	1.654	0.276	1.930	27.74%
Cynon with the Dare and Aman: IW024 Hirwaun; IW025 Llwydcoed; IW026 Gadlys; IW027 Abernant; IW028 Aberaman	17.440	6.653	1.617	8.27	47.42%
Total area and overall maximum percentage area surviving	44.891	13.8339	3.1407	16.975	37.81%

A significant result was noted for the Eastern Valley (Cwm Sychan and Cwm Ffrwd); although the smallest of the extractive valley landscapes, this landscape was found to potentially retain over 75% of its original extractive area resource despite extensive opencast and land reclamation operations. Also of note was the Nant-y-glo and Ebbw fach system, which potentially retains over 53% of its original extractive resource, closely followed by the Cynon Valley with the Dare and Aman Valleys where over 47% of the original extractive area resource was found to potentially survive, whilst the Sirhowy and Tredegar area retaining almost 40% of its former valley extractive landscape.

To further refine above analysis of the extractive landscapes, the incidence of archaeological area significance (relating to extractive areas with levels of current protection and other known registers) was also analysed within these broader areas. The results of this analysis largely mirrors that of the landscape survival analysis; again the Eastern Valley (Cwm Sychan and Cwm Ffrwd) registers high, as does Sirhowy and Tredegar, both with 2 extractive areas of category 'A' having protected extractive related features, whilst Cynon with the Dare and Aman, returned the highest score for category 'B' and 'U' areas, around double those of the other areas. Apart from Cynon with the Dare and Aman, and Beaufort and Ebbw Vale all landscape areas have at least one extractive area belonging to category 'A'.

The level of available study or survey undertaken for extractive areas was found to be generally low with the exception of areas within and immediately adjacent to Merthyr Tydfil and Blaenavon, where for instance geographically limited but intensive survey work has been carried out by the Royal Commission on workings related to Llwydcoed, Cyfarthfa, Dowlais and Rhymney, in addition to Blaenavon and Varteg ironworks. It is highly likely that additional detailed survey would have similar results elsewhere within the study area and further detailed documentary work and targeted field survey has been recommended. Recommendations were also made for the production of detailed management, conservation and protection priorities, and the carrying out of topographic surveys and detailed recording.

5.5 *Introduction to the Year 6 Extraction Area Based on Year 4*

Cynon with the Dare and Aman

The consultation of the first edition OS maps revealed an extractive valley landscape comprising 35 separate polygon areas amounting to 17.44 sq km in total area within the Cynon, Dare and Aman Valleys. This was an extensive extractive landscape area extending from limestone quarries at Penderyn in the north to patch and other workings to the west and southwest on Hirwaun Common, at Rhigos and elsewhere serving Hirwaun Ironworks, and to the north east of Aberdare including Fothergill's Patches, the latter forming part of a wider Aberdare Extractive area (EA001). Extractive areas associated with Llwydcoed, Gadlys and Abernant form the core, whilst extraction extends further south from Cwmbach (EA006) and Lletty Shenkin (EA008). The extractive areas in this valley landscape would have supplied the ironworks of IW024 Hirwaun, IW025 Llwydcoed, IW026 Gadlys, and IW027 Abernant. Further south and slightly separate were a cluster of smaller workings probably associated with the Aberaman Ironworks (IW028), or earlier ironworks further up the Aman Valley. In the area south of Cwmbach, discrete areas of extraction follow the valley towards Mountain Ash, these include Deep Duffryn Colliery (EA015) and Navigation Colliery (EA017), and a number of quarries; on current evidence these are considered unlikely to have been ironworks related, at least during their main period of exploitation.

A potential total surviving extractive area of 8.27sq km, ie 47.42% of the original valley resource, was identified from aerial photographs, National Coal Board opencast information, and modern mapping. This area comprised 38 surviving polygon areas (6.653 sq km), to which has been added a further 21 polygon areas of potentially surviving extraction (1.617 sq km). The valley landscape area has 13 surviving extractive areas with previously noted extractive features, none of which are currently protected through legislation, the identified areas as follows: Aberdare Extractive Area (EA001); Ffynnon Lassa Quarry (EA003); Hirwaun Common Extractive Area (EA005); Cwmbach Extractive Area (EA006); Lletty Shenkin Extractive Area, (EA008); Gadlys Extractive Area (EA010); Aberaman Extractive Area (EA020); Cwmaman Colliery (EA022); Bwllfa Colliery (EA026); Rhigos Extractive Area (EA027); Llwydcoed Quarries (EA029); Cwar Mawr, (EA031); and Penderyn-foel (EA032).

A provisional historic ironworks landscape of 11.65sq km (taking in 31 polygon areas, or parts thereof) has been identified and plotted on the basis of the results of the previous years of the project augmented by the potential surviving extractive areas which can be demonstrated to be potentially closely associated with the best of the surviving core areas. This area excludes the extractive areas associated with Aberaman Ironworks IW028, because of poor survival of the core ironworks area. Areas to the south of Aberaman within the Cynon Valley are also excluded as these are considered unlikely to have been related primarily to ironworks extraction.

Eastern Valley (Cwm Sychan and Cwm Ffrwd)

A fairly small-scale extractive landscape (14 polygon areas mapped amounting to 3.019 sq km in total area) by comparison with those noted elsewhere in the study area, that within the Cwm Sychan and Cwm Ffrwd tributary valleys exploited the southeastern flanks of Mynydd Varteg fach, and eastern flanks of Waun-wen and Byrgwm including Cwmbyrgwm Colliery, and workings in Cwm Sychan and Cwm Du, with outlying quarries and workings at Blaenmelyn on the southern flank of Mynydd Varteg Fawr. Other smaller outlying workings, chiefly quarries are to be found on the eastern side of the Cwm Afon Valley within Lasgarn Wood and Cwm Lasgarn itself, linked by a disused tramroad and incline system to the ironworks of the area on the lower western flanks of the valley. The extractive areas of this area served the following ironworks IW002 Varteg, IW003 Golynos, IW004 the British, and IW005 Pentwyn.

A potential total surviving extractive landscape area of 2.266 sq km, ie 75.06% of the original valley resource survives made up of 11 surviving polygon areas (2.241 sq km), increased by 1 potentially surviving polygon area (0.025 sq km). The extractive landscape within this valley area appears to largely survive (total potential surviving area:), though extensive opencast operations in particular on Mynydd Varteg Fach, and to the west of Cwm Ffrwd have removed some of the resource. Aerial photographic and other baseline documentary evidence indicates that much of significance survives in the area around the British Ironworks, including Levels, tips and colliery workings within Cwm Sychan within the Varteg Hill area (EA093), and also Cwm Byrgwm (including the scheduled colliery SAM MM163), and Cwm Du within the British Ironworks Extractive area (EA112), as well as within the core ironworks area of the British itself, with its scheduled and listed Pumping Engine House (SAM MM216; LB 18595).

Other potential areas of surviving extractive remains are Cwrt-yr-eos Quarry (EA110), Nant-y-mailor Quarry (EA099) and Twyn-y-ffrwd Quarry (EA111) within Lasgarn Wood and Cwm Lasgarn on the eastern side of the Cwm Afon valley.

A provisional historic ironworks landscape of 3.444 sq km (taking in 13 polygon areas, or parts thereof) has been identified and plotted on the basis of the results of the previous years of the project augmented by the potential surviving extractive areas which can be demonstrated to be potentially closely associated with the best of the surviving core areas.

6 Year Six Study Area Report

Geological background

A characteristic of the iron industry was that the sites of the ironworks were located as close as possible to their raw material resources. This stems from the need to minimise bulk transportation of fuel, and necessary ingredients: coal, iron ore or ironstone, and limestone. The Geology of the study area is Carboniferous, including Coal Measures (the Lower Coal Measures, Pennant Series), Millstone Grit, and to a lesser extent Carboniferous Limestone.

The western area's geological history has been dealt with in considerable detail elsewhere, for example Cynon Valley History Society 2001, 1-13. In short, the Coal Measures with bands of grit, cut by a series of NW-SE faults, generally outcrop in the area of Hirwaun Common, to the south of Hirwaun between the area of Rhigos, Mynydd Cefn-y-gyngon. The Coal Measures extend down the Cynon Valley generally south of Nant-Hir and Llwydcoed taking in the northeast side of the Cynon Valley, south of and including Mynydd Aberdare. Numerous coal crops of the Middle Coal Measures, Lower Coal Measures, and the Upper Coal (Pennant) Measures have been exploited in the area (see appendix III for further details). To the south of Hirwaun, the Upper and Lower Cwmgorse Marine Bands underlie and give way higher strata, in the form of the sandstone ridges of Craig-y-bwlch and Mynydd Cefn-y-gyngon and to the south of Cwm dare Craig-rhiwmynach, the same pattern is repeated on the northeast side of the Cynon Valley at Cefn Pennar. Cil-yr-ychan Limestone and Llandyfan Limestone of the Carboniferous Limestone Series: Oolite and Honeycombed Sandstone and Basal Grit of the Namurian Millstone Grit Series, outcrop at Penderyn, and were exploited in the quarries at Penderyn-foel (British Geological Survey, 1979 Merthyr Tydfil & Pontypridd, Solid with Drift Sheets 231 & 248).

Within the Eastern Valley area, just at the eastern edge of the South Wales Coal field the workings are found on the east- and west-facing slopes the Afon Llwyd valley north of Pontypool and its tributary valleys; on the west from north to south: Cwm Ffrwd, Cwm Sychan, Cwm Byrgwm and Cwm Du; and on the east Cwm Lasgarn. The high ridge to the west of the Afon Llwyd, from Mynydd Coity and Mynydd Farteg-fawr to Twyn Du and Waun Wen is Pennant Grit of the Carboniferous Coal Measures. The slopes below, from Mynydd Farteg-fach (and Blaenafon) in the north to Pentre Piod in the South and beyond, the Carboniferous Coal Measures of the Lower Coal series: Red Ash, Tillery, or Brithdir Coal and quartz conglomerate, the Elled Coal, Big Vein (or Upper 4ft) Coal, Black Vein (or Rhaslas) Coal and Old Coal coal crops evident.

A narrow band of Millstone Grit (Farewell Rock) outcrops at the east of Waun Hoskin, extending south to Garndiffaith, and beyond, whilst further east and on the east bank of the Afon Llwyd, including Cwm Lasgarn, Lower Avonian Carboniferous Limestone predominates. Above to the east, the ridge of Mynydd Garn-fawr and Mynydd Garn Clochdy is predominantly Millstone Grit of the Shale Group overlain by Millstone Grit of the Farewell Rock (British Geological Survey, 1979, Abergavenny, Solid with Drift Sheet 232).

A basic description of the incidence of geological features in relation to the extractive areas visited during the course of this year's project is presented in the appendices.

Raw Materials

South Wales is known to have been an important centre of iron production since the sixteenth century, and during the late 18th and early 19th centuries was the leading iron producing region in the world. The industry was based on the exploitation of local ‘mine’ or iron ore won from the coal measures easily accessible along the northern rim of the South Wales coalfield, where seams were near horizontal and outcropped at the surface. Atkinson and Baber note that the ‘extensive exposure of seams at the surface meant that cheap surface-mining of both coal and ironstone was possible during much of the prosperous period of iron smelting in South Wales’ (Atkinson and Baber 1987). Of the three basic raw materials required for iron production, iron ore and coal were the most significant for determining the location of ironworks; limestone was the least significant as the process demanded relatively small amounts of the material. Within the northern outcrop area of South East Wales limestone suitable for use as flux in blast furnaces underlay the coal and ironstone seams and extraction by means of open quarry along the adjacent flanks of the Brecon Beacons, such as at Penderyn, was possible in relative close proximity to the furnaces (Atkinson and Baber 1987). Both coal and ironstone occur in horizontal or near horizontal seams, mostly interstratified, but occasionally, as with the Blackband ironstones, a notable feature of the Brynmawr Area further to the east, intermixed within the same seam.

In conjunction with the establishment of large-scale industrial enterprise from the mid-18th century extensive areas of manorial waste were exploited initially for accessible (largely surface and shallow) deposits of coal, iron and limestone using a variety of methods open cast, bell pit and level workings (Osborne, 1976, 37). The attraction to manorial waste is reflected by the location of the extractive areas identified and selected for the purpose of the current year’s project; the overriding majority of the visited extractive areas lie within open mountain, or along the margins of the enclosed land, within what is today predominantly open access land. A number of factors drew early industrialists to manorial wastelands; ‘the form and scale of contemporary mining operations necessitated the unrestricted control of large blocks of land for the mining and processing of ores and fuels’, whilst a single owner, the lord of the manor, simplified negotiations to access mineral rights, in addition industrial leases of wasteland were ‘inexpensive, liberal and comprehensive’ when compared with the compensation required to develop improved lands held in severalty (Osborne, 1976, 37-38). Atkinson and Baber discuss the vagaries of mineral lease arrangement in detail and the ways in which they developed over time; the terms and lengths of terms applied to leases, which usually involved a ‘dead’ or ‘certain rent’ and a royalty rate, indicate the lack of understanding that landlords generally had regarding the true value of their mineral holdings. During the initial phases, these were frequently over favourable to their lessees.

Prior to the adoption of hot-blast technologies from the mid-19th century, the high carbon content of coal available along the northern coalfield rim of South Wales as opposed to elsewhere in Britain also proved to be an advantage: ‘the carbon content of Welsh Coal exceeded 80% compared to 63% for Yorkshire, 61% for Derbyshire, 54% for Staffordshire and 35-40% for Scotland’ (Atkinson and Baber 1987). This had the effect of reducing the amount of fuel required in the process, and thereby reducing cost.

The variety of iron ores, dependant on chemical variations and metal content, meant that some amount of ore has always been sourced from beyond the area; Red and brown haematites (limonite) in particular were of great importance to the South Wales Iron industry, though were not found in any great quantity in South Wales. The locally available sources of iron ore chiefly comprised Clay ironstone (20-37% metal when pure/20-32% metal as mined) and Blackband

(17-30% metal when pure and as mined). The latter, discovered near Nantyglo in 1834, was initially processed at source by stacking in heaps and burning to remove impurities, prior to transferral to the furnace sites (Barber 1996; Jennings 1934).

The exploitation of local ironstone appears to have declined gradually as costs of mining the material increased, as shallow surface workings gave way to deep shaft mining by the latter half of the 19th century. It is known that imported ores chiefly from South West England and Cumbria had played a part in the South Wales iron industry from the early part of the 19th century, though a considerable increase in imported haematite ore occurred from the late 1830s and 1840s, corresponding with the heavy involvement of the South Wales iron industry with the rail trade, and the technological requirements demanded; a variety of irons of different qualities suited to different purposes were produced by varying mixes of ironstone, haematite and coke. By the mid-1850s the higher grade haematite ores had become cheaper than locally produced ironstone or Welsh Mine, in addition the higher wages of the burgeoning Welsh coal industry also acted to entice workers away from ironstone mining. A combination of technological requirements and price increases resulted in a decline in Welsh Mine or ironstone production by over two thirds between 1855 and 1860, which largely limited the local raw material base of the South Wales iron industry to coal (Atkinson and Baber 1987, 16-35). With the conversion during the 1860s from iron production to the acid steel industry, dependant on non-phosphoric haematite ores, chiefly imported from Northern Spain from 1870s, the local ironstone industry further declined.

Methods of Extraction

Ironstone and coal extraction in South East Wales, as elsewhere, was initially characterised by shallow surface workings known as ‘patches’, a form of workings, which survived in use until 1860. The extraction was largely carried out by means of ‘scouring’, whereby a flow of water was used to wash out and/or process minerals. Open quarries, generally linear or curvilinear following the line of a seam or mineral surface outcrop were also commonly employed, again frequently in combination with scouring. Other types of workings have also been noted in the study area, ranging from adits to shallow shaft workings (eg crown pit and bell pit workings), and rakes. Shallow shaft workings were often found to lie at the edge of scoured and quarried areas, indicating a stratigraphy of mine working whereby initial concentrations of shallow pit workings, following a mineral seam are superseded by opencast quarries. Between the early and mid-19th century underground extraction methods generally employed level workings; these were driven into the slope, frequently chasing the mineral bearing strata exposed in the sides of scoured areas and opencast quarry workings. Deep shaft mining was a later development, largely post-1850, and in direct response to shortages in available surface mineral reserves.

The exploitation of mineral deposits depended heavily on the collection and deployment of water resources, with scouring figuring constantly until the mid-19th century in accounts of iron ore extraction. The use of scouring or ‘hushing’ to obtain minerals from shallow surface deposits has been demonstrated to date to at least the Roman, and possibly the Bronze Age (see Wakelin, 1996, 62). Documentary sources provide evidence that scouring was a common practice used in relation to iron ore extraction until at least the end of the 18th century. Lloyd quotes a case let to legal counsel in 1795, which refers to its ancient nature, ‘Scouring the Mine (by collecting Water and letting it down in large Quantities to carry off the earth and Rubbish) has been immemorially practised on these Commons, and anciently the ponds were much more numerous, but not so large as those used at present’ (Lloyd 1906, 37). The practice appears to have continued into the

early decades of the 19th century, though by the mid-19th century was no longer encouraged with leases prescribing the use of ‘patch or scour in working the minerals’ (Osborne 1976, 41).

Scouring had several applications from use as a prospecting tool to expose mineral veins and seams, as a means of clearing overburden and also as a tool to break down the seams themselves (Rogers 1861; Cranstone 1994, 144-6; Hughes 1994, 49-50; Wakelin 1996; 62-67). It has been noted that scouring was particularly useful ‘for separating the dense ore nodules from clays and shales,’ and was ‘used to clean piles of previously dug ore from both surface workings and drift mines’ (Wakelin 1996, 63; Osborne 1976, 39). Frequent allusion is made to the dramatic and destructive effects that early iron ore extraction techniques had on the landscape; both the use of scouring and the associated method of patching, a primitive form of surface working, effectively reduced the viability of other traditional uses of the open common. Records note that adjacent areas of enclosed land were affected by run off and rendered boggy and useless, whilst long-term silting damaged the wider river systems of the area, and also resulted in increased instances of flooding (Wakelin 1996, 63; Osborne 1976, 39).

Documentary evidence indicates that the most extensive damage was caused as a result of processing the ore itself as opposed to simply stripping overlying cover and overburden; the mines were scoured after they had been dug, which made the ore ‘less expensive in carriage and cleaner for the furnaces’.

In general, the processing of ironstone appears to have been a lengthy process. On extraction from quarries, pits, levels and shafts, the ironstone would have required initial processing to allow the removal of clay and waste material, this is known to have been achieved by stacking into piles to allow weathering to occur, possibly over winter to benefit from the action of frost and rain. The use of scouring at this stage was no doubt used as a means of accelerating this process. The stones and nodules were then picked out by hand, often child and female labour was used. Documentary evidence indicates that ironstone was stacked and sold in “dozens”, a rectangular pile approximately a yard in width by 3 yards in length and 22 inches high, each pile roughly equivalent to 4 and ½ tons. It has been estimated that a bell-pit of about 30ft in depth would have provided between 12 and 16 dozens or 55-72 tons of ironstone (Willies 1997, 9). The next stage in the process was calcining to remove water and reduce carbonates to oxide, which resulted in a 25-30% reduction in weight. This involved heaping ironstone nodules and burning with layers of coal slack and was frequently done at the extractive site itself, as coal was also usually available, though in some cases within calcining kilns located close to the ironworks themselves. The following method is described: a layer of coal 6-8 inches thick is placed on level ground, on top of which was placed a stack up to two feet in depth of evenly sized ironstone pieces. The top of the heap was levelled with smaller ironstone pieces and a further two inches of smaller coals. Additional ironstone was placed to form a wedge-shaped heap and the whole covered with further coal. The resultant heap was typically about 7 ft high and between 15 and 20ft in length. After burning and cooling a heap of porous ore suitable for the furnace was the result (Willies 1997, 9). The process of obtaining furnace ready ore from the ‘Black band’ appears to have been similar, with stacking and burning of the extracted raw material taking place, though there was apparently no need to scour the iron ore as the material comprised a thin seam of fine iron ore within a fine matrix of grit and partially pulverised coal, suitable for immediate firing (Lloyd 1906, 188).

It should be noted that the sites associated with iron ore processing are now obscured by vegetation, often dense and therefore are allusive and difficult to identify on the ground. Further

intensive fieldwork and analysis of spoil and ground surfaces would be required to allow the identification of remains associated with this process on the ground. In all likelihood only the final stages of these process would be identifiable, it should be remembered that quarrying and mining are dynamic and destructive processes.

The Mineral Holdings

The (coke-fired blast furnaces) ironworks within the Year 6 study area include in the western part: Hirwaun (established c.1757), Llwydcoed (1801), Abernant (1804), Gadlys (1827) and Aberaman (1843); in the eastern part: Varteg (1803), Pentwyn (1825), Abersychan or British Ironworks (1827) and Golynos (1837).

A review of primary (cartographic and documentary) and secondary sources identified the specific locations of the mineral holdings associated with the ironworks of the area. Many of these holdings had traditionally been worked for mine and coal prior to the establishment of the generation of coke fuelled furnaces, and there are numerous references to early extraction in the Aberdare area, for example in 1612 a small pit was opened in Rhigos, and a lease of 1631 records that the Earl of Pembroke leased several parcels of land to Thomas Matthew, including Tyr Wayne Wrgan (Hirwaun Common) with 'the liberty to dig cole therein' (Cynon Valley History Society 2001, 15-17).

Documentary evidence indicates that the mineral holdings associated with the coke furnaces at Hirwaun were located at 'Tyr Waun Wrgan or Hirwaun Wrgan' (Windsor leases of 1757 and 1760), on Hirwaun Common south of the River Cynon, the actual ironworks furnace was located north of the River Cynon at Tyr Gwynbach. A lease of August 14th 1775 mentions completion of a new road to a coal works known as 'Bryngwyn Coal Works'; the same lease indicates a mineral property of the Gollen and Bryngwyn Coal Works, in addition to iron mine and other mineral rights under the Windsor lease, and the right to raise coal and iron ore on the Estates of Edward Mathews, Esq (Lloyd 1906, 11-17). The lower lying area of the Bryngwyn patches and the adjacent Slade's Patch (now largely lost to 20th century opencast) below the slopes of Mynydd Cefn-y-Gyngon, were worked by the patching method, the steep slopes above generally necessitated the use of levels (Cynon Valley History Society 2001, 19). The difficulty in obtaining coal of the right quality to produce coke from the Aberdare and the need use a mix coals from different areas to produce suitable coke has been remarked upon (Cynon Valley History Society 2001, 18). In 1810, for example, Hirwaun used a mix of coals mined in four different areas: the 'dirty' vein mined at Level Fawr, near Penywaun, the upper four feet taken from the patches near Bryngwyn, the Graig seam worked near Bwlch y Lladron, and the Gorllwyn level (Cynon Valley History Society 2001, 18).

The limestone quarries which provided the fluxing agent for the Hirwaun furnaces were located in Penderyn (Penderyn-foel), near to the parish church, the limestone being conveyed to the Furnace by tramroad following the Afon Cynon; the freehold of the quarries being in private hands. These limestone quarries also supplied the ironworks at Aberdare (Llwydcoed), Abernant, Gadlys and Aberaman (Lloyd 1906, 17).

The mineral property associated with Llwydcoed mentioned in an indenture of 1800, are identified in a lease of 1787, the Forest of Llwydcoed in the area between the River Cynon and Nant Hir 'abutting on the lands of Edward Matthew, of Aberaman, to the lands of Thomas William Watkin' and premises purchased by Samuel Hughes from Edward Matthew, esq. included was a tract of freehold land, part of the Llwydcoed Forest, known as 'Carn y Brwydr'. A lease of 1799 added 'all mines, minerals, coal and iron ore' under the lands of Tir Ergid farm (Lloyd 1906, 113-116). The workings of Aberdare included Shop Little Pit, Shop Level Pit, also

known as Tir Ergid Pit, all near Shop Houses, in the area beyond Pentwyn Houses were Swamp Level, Patch Level, and Dyllas New Drift, and near the latter Big Level, opened in 1812, noted as a source of coking coal from the 9 ft seam (Cynon Valley History Society 2001, 22). Also associated with Aberdare, following the post-1819 amalgamation of Aberdare with Abernant, was River Level Pit (at Abernant Ironworks) and Park Level Pit (near Ysguborwen).

The mineral take for the Abernant ironworks included ‘Tyr yr Werva and Gorangon vach Farms, sit. in Ystradyvodock’; and of Abernant y Wenallt in Aberdare...’ (Draft lease of 1801). A further lease allowed the Abernant company access to ‘all the seams of coal and veins of iron ore under the lands of ‘Tyr William Cant Pwynt, Blaenant y Wenallt, Tyr Ralph, Cynnon Farm, and Ty Llwyd’ (Lloyd 1906, 116-118).

The Abernant works was purchased by the Aberdare Iron Company in 1819; thereafter the Abernant and the Aberdare ironworks and their mineral holdings were worked as a single concern with the ironstone or mine coming from patch workings in the Llwydcoed area and coal from Abernant. By 1837 the Aberdare Iron Company’s combined leaseholds comprised 2498 acres: Llwydcoed (900 acres), Tyr yr Ergid (70 acres), Bryn David (70 acres), Abernant, No 1 (92 acres), Abernant, No 2 (1366 acres), previously in 1831, an Edward Morgan Williams of Gadlys, the then freehold owner of Tyr yr Ergid, had released the Aberdare Iron Company from claims of ‘damages and waste [caused] to the said property’ and allowed them to work the ‘mines and veins of coal’ at Tyr y Ergid (Lloyd 1906, 122, 124). In 1871 the Aberdare Company known to have owned the following: Blaenant, Cwmbach, Forge, Mountain, Park and Tunnel pits. Richard Fothergill and Co (Richard Fothergill was the then manager of Abernant ironworks), owned Abernant Pit during the period (Cynon Valley History Society 2001, 23).

The mineral takings of the Gadlys Ironworks, some 350 acres leased from the Bute Estate, were located on the right (southwest) bank of the River Cynon, the 1835 particulars of sale, mention that ore was obtained from 1.5 miles from the works, ‘and within 500 Yards of the public tram road.’ Also, that the ‘well ventilated’ works were ‘advantageously situate for Working the extensive and hitherto untouched Mineral District of Cwm Dare’ (Lloyd 1906, 127-128).’ In addition to winning coal and mine from the nearby Gadlys and Dare pits, the Gadlys Ironworks also obtained some coal and mine from Llwydcoed, specifically from George Edmunds’s Patch and Jenkin Richards’s Patch on the upper part of the mountain and from other workings in the area, such as the drift and level at Dyllas, transported to Gadlys by the extensive tramroad network including the Aberdare Canal Company’s tramroad to the iron Robertstown Bridge, and thereafter the Gadlys Works tramroad (Cynon Valley History Society 2001, 22).

It should be noted that the sinking of many of the pits in the area, especially from around 1837, were largely driven by the demand for steam coal production mainly for maritime use, the number of pits in the Aberdare area devoted to steam coal production dramatically increased during the 1840s and 50s, further details are available elsewhere (see Cynon Valley History Society 2001, 27).

The ironworks related mineral extraction in the Eastern Valley area appears to be as complex as the areas to the west, with, in addition to works operated by the ironworks themselves, a number of small to medium sized concerns supplied the needs of the local ironworks, as well as the general market. The evidence though is less well-documented; the tangled and often sporadic production history of the ironworks of the area may underline this.

The Varteg Ironworks commenced production in 1803 under the ownership of Knight & Co, the main partner of which was John Knight. Between 1805 and 1823 production rose from 900 tons of iron 6,513 tons. Between 1826 and 1830, under the control of Kenricks & Co. production

further increased from 7,800 tons to 13,536 tons. The Varteg Iron Company took over the operation in 1837 and maintained production until c.1843, at which date it owned 86.10ha; occupying 26.81ha, and leasing out an additional 59.29ha, the Company also leased and occupied a further 189.73ha within the parish of Trevethin (Trevethin Tithe map of 1843).

The Pentwyn Ironworks constructed by the Hunt brothers in 1825, was producing 5,391 tons of iron by 1830. In 1838, the latter works merged with The Golynos Ironworks, which had started production the year before, though by 1850 the joint operation had effectively ceased. During this period the joint works of the Pentwyn & Golynos Iron Company owned some 268.46ha and leased a further 34.02ha of land in the parish of Trevethin (Trevethin Tithe map of 1843).

In 1854 the Varteg Ironworks was taken over by the Golynos works under Williams & Co, though by 1855 Varteg was again unoccupied. In 1858 both Golynos and Varteg were leased to Crawshay Bailey and William Morgan and four of the six furnaces were returned to blast for a short period; however between 1861 and closure at the end of 1864 only a single furnace sporadically operated at Varteg (under Partridge & Jones from 1862 and G.E Bevan & Co. of Golynos from 1864. Two furnaces remained in blast at Pentwyn from 1865 until 1868, after which the works was dismantled. (Barber 1999; Ince 1993, pp 112, 124-125).

Lloyd has also previously remarked on the fact that in comparison with other areas there is relatively little readily available documentary evidence specifically relating to the mineral holdings of the Varteg, Golynos, Pentwyn and British Ironworks (Lloyd 1906). The mineral holdings of the area included those both owned, and leased by the Iron Companies and also leased out to other entrepreneurs, such as, among others, John Vipond (J. Vipond and Co. Ltd., Pontypool), who initially leased the Cwm Ffrwd Rock Vein Colliery in the Varteg area from 1840 to supply local ironworks. The Tithe map of 1843 records that John Vipond was leasing some 28ha (69 acres and 28 perches) from the Varteg Iron Company.

Vipond also operated the Varteg-hill Colliery, opened in 1860 as a coal and iron mine linked to Mine Slope with mine kilns and calcining kilns. An incline linked the colliery to the Monmouthshire Railway Eastern Valley section at Cwmavon station; later the incline was replaced by a branch line of the LNWR, built c1878, to link the colliery to the LNWR Blaenavon-Brynmaur Branch. Vipond's interests in the Varteg area in 1896 were as follows: Big Vein Pit (managed by J. Brace, worked the Big and Elled coal crop); Elled Pit (managed by J. Brace, worked the Big and Elled coal crop); New Slope (managed by F.H. Davies, worked the Big and Elled coal crop); Rock Pit (managed by F.H. Davies, worked the Rock, Meadow, and Old Coal coal crops); Rock Slope (managed by F.H. Davies, worked the Rock and Meadow Vein coal crop); and Varteg Hill No. 2 Mine Pit (managed by F.H. Davies, worked Jack and Ball Mine).⁸

The ironworks also drew on mineral reserves from beyond the area, for example The Golynos Ironworks was operating collieries in the Crumlin area from before 1830: Kendon Collieries and Bush Colliery.⁹

From c.1850 William Williams of Beaufort owned Mines at Golynos including Black Vein Levels and No 10 Golynos Slope. This concern was later associated with Messrs Partridge and Jones, owners of the Varteg works between 1862 and 1864, and who also owned coal workings

⁸ Based on tables compiled by Joseph S. Martin, H.M. Inspector for the South Western District in his Report for 1896.

⁹ Royal Commission Report of 1842

to the south in Cwmnantddu: Blaensychan (Blaen-serchan) and Hafod Vein Llanerch, working the Tillery and Three Quarters, Rock, Meadow, respectively.

William Richards, sometime owner of the Golynos Works, is known to have opened a mine at Golynos, Talywain around 1860, and by 1880 is recorded as owning Golynos Slope, which was later taken over by Hoskins and Llewelyn (Abersychan Elled Co., who developed the 'Abersychan Big pits. Golynos Nos 1 & 2 pits under the ownership of the Abersychan Elled Co., were worked in conjunction with the Abersychan Big Pit employing 501 men; these pits produced Coking coal in addition to Gas, House and Steam coal.¹⁰

The largest of the works in the area was the Abersychan or British Ironworks was built by the British Iron Company, formed in 1824 with John Taylor, Robert Small and James Henry Shears as managing directors. Construction started in 1826, though problems with construction of the furnaces delayed production until 1827, by 1830 production was at 10,644 tons of iron. Production consisted initially of merchant bar iron later converting to the production of rails. A period which began with financial difficulties in the 1840s, followed by reorganization under the title of the New British Iron Company and conversion to hot blast, ended in Bankruptcy in 1851. The Ebbw Vale Iron Company purchased the Abersychan Ironworks in 1852 and operated the works at full capacity between 1856 and 1860. The drop in demand for iron during the early 1860s resulted in the Ebbw Vale Company putting the Abersychan furnaces out of blast during 1862-63. In 1864 four furnaces were in blast and production of rails at Abersychan continued during the remaining years of the decade. In 1869 the works had five of their six furnaces in blast and rail production continued during the early 1870s, however the drop in demand for wrought iron rails forced closure in September 1876. From April 1877 the works reopened and began production of spiegeleisen for the Ebbw Vale Ironworks, eventually ceasing production in 1881 (Ince 1993, pp 11-112).

A map of 1825-26, details numerous levels and other workings in the immediate vicinity of the Abersychan Ironworks itself, and the limestone quarries east of the Afon Llwyd at Lasgarn, later the Tithe map and the 1st edition 1" map details the Abersychan Limestone Railway and the Nant-y-mailor or Cwm Lasgarn Quarry. By 1843 The British Iron Company owned 74.73ha of land within the parish of Trevithin, though leased considerably more in the area, some 561.87ha, encompassing the site of the Ironworks itself and associated extractive areas (Trevithin Tithe Map of 1843).

Other known early coal workings (both shown on Map of ironworks and collieries in Monmouthshire, by John Prujean 1843) in the area include: Cwmburgwm and Glyn-nant-ddu, Abersychan both owned by James and Emanuel and working Tillery Seam, and Pentwyn Slope, Abersychan owned by Jabez Gregory, and working the Old Coal crop; the former known to have employed 118, the latter 6 workers in 1896.

Little is documented for the extraction area of Pant-glas Slip. The Trevithin Tithe map and apportionment of 1843 shows the area was owned largely by the Pentwyn and Golynos Iron Company with the area occupied by smallholdings/cottages and rough pasture set along the margins of the open mountain; many of which have disappeared by the survey of the 1st edition OS. One feature, EA112.48, considered to be possible quarry worker's hut, may be a former cottage shown on the Tithe map, homestead No. 1249, then owned and occupied by the Pentwyn and Golynos Iron Co. It is possible that before the area's direct exploitation by the iron

¹⁰ Ibid.

company, some level of local extraction may have been carried out by smallholders occupying the area.

The adjacent Cwmybyrgwm Colliery site to the east above the Abersychan British Ironworks site, which dates from the 1840s with its surviving ventilation chimney, shafts, waterbalance pits and remains of headgear scattered over the associated spoil tips, is currently a Scheduled Ancient Monument (SAM MM163), and is not considered further here. To the northeast the British Quarry (EA093.29) was connected with the British Ironworks by an incline (EA093.47) with a stone arched sub-way or culvert at SO25350365. To the north west of the quarry, just within the limits of the enclosed land given as rough pasture, and leased by the British iron Co. from the Lord and Lady of the Manor on the 1843 Tithe apportionment, is a NE-SW aligned rectangular building shown at the junction of two enclosures close to a track leading from the open mountain along the northern edge of Cwm Byrgwm to the settlement of industrial Terraces northwest of the British Ironworks. A building approximately at this location on the 1st edition, set at the western end of a small WSW-ENE aligned sub-rectangular enclosure, is named as the Barrack; possibly temporary accommodation for quarry workers?

The Cwm-sychan extractive area (EA093.25), the site of the Cwmsychan Red Ash Colliery (SO24910436) also known as 'Abertillery and Tal-y-waun Collieries' (2nd edition OS map, 1902), was excluded from the current year's project as the surviving remains are considered to post-date the operation of the ironworks. Excluded at an early stage were the workings of the Cwm Ffrwd Valley, site of John Vipond's Lower Varteg Colliery, as the area has been subject to reclamation and land restoration.

Introduction

The current year's study was limited to a reduced study area based on the Year 4 extractive areas. This comprised a western area, the Cynon Valley between Hirwaun and Aberaman, and the limestone area of Penderyn to the north of Hirwaun, and an eastern area based on the Eastern Valley, added during the second half of the year.

For the western area a total of 35 of the 156 extractive areas, which had been identified as potentially associated with ironworks from OS mapping in Year 4, were located within the reduced study area of Cynon Valley between Hirwaun and Aberaman, and the limestone area of Penderyn area; of which 59 sub-areas were considered to be surviving and/or potentially surviving landscapes. A provisional historic ironworks landscape of 11.65 sq km (31 polygon areas), excluding the extractive areas associated closely with the Aberaman Ironworks, was taken forward in the current year. Following the preliminary site visits to these 31 areas to assess practicalities of access and confirm survival, 15 areas (all located north of Aberaman), were selected for detailed walk over survey and further assessment. This also resulted in the expansion of the area boundaries in a few cases. For this reason the boundaries and areas have been revised and now supersede those mapped for the previous year.

The fieldwork carried out during year 6, in combination with a review of cartographic and aerial photographic material, has allowed the work carried out during previous years to be refined into discrete extractive areas, considered to represent some of the best surviving extraction associated, or potentially associated with iron production within the Rhondda Cynon Taf UA. Specifically the Cynon valley area, including Hirwaun and Penderyn. A total of 15 extractive areas, divided into 33 sub-areas of surviving extraction (amounting to some 471.5 ha), were described in detail with information given on subsidiary features. In addition to the 33 areas, the year 6 study identified 468 interests in total, including 136 major (ie significance value B and above) extractive features. These features were visited (where possible), and recorded as a result, with condition assessed, and proformas completed. In addition to those extraction features identified during Year 4, some 363 features were newly recorded as a result of the cartographic searches, walkover survey and aerial photographic review carried out during year 6, and many of the descriptions of the 105 HER/NMR sites were augmented, these are described in more detail within the gazetteer (see Vol. 2).

For the eastern area a total of 13 of the 14 extractive areas, which had been identified as potentially associated with ironworks from OS mapping in Year 4, were located within the reduced study area of Eastern Valley (excluding Upper Race Ironworks); of which 51 sub-areas were considered to be surviving and/or potentially surviving landscapes. A provisional historic ironworks landscape of 2.582 sq km (13 polygon areas) was taken forward for Eastern Valley in the current year. Following the preliminary Land Registry searches, and landowner contact, 8 areas (41 sub-areas) were initially selected for detailed walk over survey and further assessment. For example as permission for access was denied, the eastern half of EA0112 (ie. sub-area EA0112.01 the British Extractive Area) and much of area EA093C (eg. sub-area EA093.27, Cwm-sychan Place) was excluded.

The selection was further reduced in addition to reasons of permitted access, on the basis of available time and practicality combined with what was achievable given prolonged winter weather; for example given the available time and bad weather EA093.029 The British Quarry, and other high level quarries EA093.028 and EA093.026 were also excluded from the visit. These features (including at least one incline/access track/tramroad) are known to survive in relatively good condition and will require future survey outside the current year's work to ascertain the exact condition and value of any remains. A final selection allowed a total of 6

extractive areas (amounting to c.161 ha), divided into 29 sub-areas of surviving extraction, were described with information given on subsidiary features. This also resulted in the expansion of the area boundaries in a few cases, and inclusion of a few outlying features. For this reason the boundaries and areas have been revised and now supersede those mapped for the previous year. In addition to the 29 sub-areas, the second part of the year 6 study identified 234 interests in total, 91 of which were visited. The latter include 45 major (ie significance value B and above) extractive features. These features were visited (where possible), and recorded as a result, with condition assessed, and proformas completed. In addition to those extraction features identified during Year 4, some 263 features were newly recorded as a result of the cartographic searches, walkover survey and aerial photographic review carried out during year 6, and many of the descriptions of the 89 HER/NMR sites were augmented, these are described in more detail within the gazetteer (see Vol. 2).

In addition the fieldwork allowed the identification and description of water management features (within the western area only), with some 36 water management features (reservoirs, ponds, feeders and leats) visited, described and assessed.

Table 7. Extractive Areas visited during Year 6

Year 4 Area Number	Year 4/6 Area Number	Year 6 Name	Type
EA001	EA001A	Bryn Defaid and Llwydcoed: Aberdare Ironworks Cinder Tip	Cinder Tip: Tips, tramroads, boilers (site of)
	EA001B	Bryn Defaid and Llwydcoed: Croesdy Patch and Ysgbubor-wen	Extractive Area: Quarries, patchworking, levels, balance pit, pits/shafts, pumping engine house, tramroads, tips
	EA001C	Bryn Defaid and Llwydcoed: Fothergill's Patches (west), Bryn-defaid Patch and Tir-yr-argae	Extractive Area: Quarries, patchworking, levels, shaft/pit, drift mine, balance pit, engine houses, tramroads and incline, tips
	EA001D	Bryn Defaid and Llwydcoed: Tre-Gibbon (north)	Extractive Area: Quarry, tips
	EA001E	Bryn Defaid and Llwydcoed: Tre-Gibbon (south)	Extractive Area: Quarries, patchworking, levels, mine, tramroads, tips
	EA001F	Bryn Defaid and Llwydcoed: Fothergill's Patches (east), Carn-y-frwydr	Extractive Area: Quarries, patchworking, levels, airshaft, tramroads, tips
	EA001G	Bryn Defaid and Llwydcoed: Gelli-isaf	Extractive Area: Quarry, tips
	EA001H	Bryn Defaid and Llwydcoed: Mountain Pit	Extractive Area: Pit/shaft, airshaft, engine house, site of tips, incline head
EA003	EA003	Blaennant (Ffynnon Lassa)	Extractive Area: Balance pit, quarry, level, tramroads, tips
EA004	EA004	Cwm Nant-yr-Hwch	Extractive Area: Quarry, mine, patchworking, tips

Southeast Wales Industrial Ironworks Landscapes

Year 4 Area Number	Year 4/6 Area Number	Year 6 Name	Type
		Quarry, Pen-y-waen	
EA005	EA005A	Hirwaun Common, East: Mynydd Cefn-y-gyngon	Extractive Area: Quarries, levels, airshafts, drift mines, inclines and tramroads, tips
	EA005B	Hirwaun Common, East: area west of Waungron	Extractive Area: Drift mine, tramroads, tips
EA006	EA006A	Cwmbach Extractive Area: Gnoll Quarry	Extractive Area: Quarry, incline, tips
	EA006B	Cwmbach Extractive Area: Graig-y-Gilfach	Extractive Area: Quarry, shaft, tips
	EA006C	Cwmbach Extractive Area: Tunnel Pit	Extractive Area: Coal pit, airshaft, tips
EA008	EA008	Lletty Shenkin Extractive Area: Lletty Shenkin Quarry	Extractive Area: Quarry, level, incline and tramroads, tips
EA010	EA010A	Gadlys Extractive Area: Merthyrdare Colliery	Extractive Area: Colliery (site of), levels, quarry, tips
	EA010B	Gadlys Extractive Area: Craig Colliery and Craig Rhiw-ddu Quarry	Extractive Area: Colliery, inclines, quarry, tips
	EA010C	Gadlys Extractive Area: Level Fach	Extractive Area: Level, inclines, tips
EA011	EA011	Blaengwawr Quarry	Extractive Area: Quarry, inclines, tips
EA026	EA026	Bwllfa and Nant Melin Collieries: Craig Nantmelyn	Extractive Area: Levels, inclines (site of), quarry, tips
EA027	EA027A	Hirwaun Common, West: Twyn Canwyllyr	Extractive Area: Drift mine, levels, colliery, quarries, inclines, tips
	EA027B	Hirwaun Common, West: area north of Bute Pit	Extractive Area: Level, tramroads, tips
	EA027C	Hirwaun Common, West: Knobby Drift	Extractive Area: Drift mine, engine house (site of), tips
EA028	EA028	Hughes's Patch	Extractive Area: Patchworkings, quarry, level, inclines and tramroads (site of), tips
EA029	EA029	Llwydcoed Quarries: Old Ironstone Level	Extractive Area: Level, tips
EA030	EA030	Pontbren Llwyd Quarry	Extractive Area: Quarry, tramroad (site of), tips
EA032	EA032A	Penderyn-foel	Extractive Area: Quarries, level, brake engine, tramroad and incline, tips
	EA032B	Penderyn-foel	Extractive Area: Quarries, brake engine, tramroad and incline, tips
	EA032C	Penderyn-foel	Extractive Area: Quarry, magazine (?), tips
	EA032D	Penderyn-foel	Extractive Area: Quarries, brake engine, tramroad and incline, tips
	EA032E	Penderyn-foel	Extractive Area: Quarries, tramroad/incline, tips
EA035	EA035	Old Quarries, east of	Extractive Area: Quarries

Southeast Wales Industrial Ironworks Landscapes

Year 4 Area Number	Year 4/6 Area Number	Year 6 Name	Type
		Pontbren Llwyd	
EA082	EA082	Varteghill Colliery & Craig-ddu Quarry	Colliery, shafts, quarries, tips, levels, coke-ovens, crane
EA093	EA093A	Varteg Hill Extractive Area: Varteg Waste	Colliery, shafts, Mine kilns, quarries, tips
	EA093B	Varteg Hill Extractive Area: Gallowsgreen and Waun-Hoskin	Quarries, tips, level?
EA099	EA099	Nant-y-mailor Quarry	Quarries, level, tips
EA110	EA110	Cwrt-yr-eos Quarry	Quarries, tips
EA112	EA112	British Ironworks Extractive Area: Pant-glas Slip	Quarries, tips

Summary area by area descriptions of the extractive areas selected for further investigation during Year 6 are presented in section 6.1, below, with a gazetteer of sites identified and visited for the purpose of the current year's project given in the appendices. Summary descriptions of the water management systems visited are given on a sub-system basis (see section 6.2, below) again with further details of individual elements/features presented in gazetteer form in the appendices.

6.1 Extractive Areas Visited During Year 6 Fieldwork

Part 1. Cynon with the Dare and Aman

Bryn Defaid and Llwydcoed (see figures 2-8)

Extractive landscape: Aberdare Ironworks Cinder Tip: EA001A (see figure 2)

EA001A Archaeological significance: C/D

This extensive cinder tip (at SO0009805593) is associated with the adjacent Aberdare (Llwydcoed) Ironworks, the site of which lies to the northeast. A mineral line defines the northeastern edge of the area, while the Afon Cynon borders the southwestern extent of the area. Tipping in the area is likely to have been begun soon after the start of iron production at Llwydcoed in 1800, and probably continued until the ironworks ceased production in 1875. The Aberdare Tithe map (1844) shows the area was owned by Sir William Douglas and let to the Aberdare Iron Company, only southern part of the area closest to the ironworks had been tipped over by this date, the northern part, 'Ynis Cae Lan' remained as pasture, though this was completely subsumed before 1868. The 1st edition OS map shows the cinder tip area is connected to the Ironworks by tramroad, whilst railed tipping lines are depicted within the area of the tip. Boilers are depicted adjacent to the tramroad as a cluster of one large and two small rectangular structures (1st edition OS 1868). See table 8, below and gazetteer for further details.

The area is largely open with some recent disturbance; none of the features identified from 1st edition OS map are now visible (other than the tramroad recorded during GGAT 80 year 2). The surfaces of the tips are undulating and the profiles indistinct due to erosion, with major scarring from off-road vehicles. There is a quantity of glass-slag, clinker and cinders on the surface, with occasional large blocks of slag, especially on the north side of the area close to the ironworks. The area is vegetated with acid grassland, with shrubby growth and trees at the boundary of the area.

Table 8. Subsidiary point and polyline features within EA001A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.49	Weighing Machine, Aberdare Ironworks	SN9917004380	Weighing Machine
EA001.50	Boiler house, Aberdare Ironworks	SN9905804415	Boiler House
EA001.51	Rectangular feature, Aberdare Ironworks	SN9903604410	Structure
EA001.52	Trackside feature, Aberdare Ironworks	SN9897904507	Structure
EA001.78	Tip Trimming Lines, Aberdare Ironworks	SN9904404411	Tramroad

Extractive landscape: Croesdy Patch and Ysgubor-wen: EA001B (see figure 3)**EA001B Archaeological significance: C/U**

An extensive extractive area centred on SO0009805593, located to the east of the Llwydcoed (Aberdare) Ironworks, between a mineral line and the former GWR branch line. The area comprises ironstone and coal patch workings (including Croedy Patch) with Levels (ironstone and coal) and pits, notably Old Pit, Croesdy Level, known to have been operating in 1880, and Ysguborwen Pit (the pithead structure and associated tramroad and tipping lines are depicted on the 1st edition OS map). The latter, begun in 1849, is described in the Davies/Godsall List as having:

‘4 shafts in colliery complex, 3 of which were flue vent shaft. Main shaft was 258’ deep to Graig seam, and 1 Level to Gellideg seam. Levels up to 21 in number.’¹¹

A Brickworks and a Pumping Engine House, were among the sites which formerly stood in the area (1st edition OS). The area’s workings were linked to the Aberdare Ironworks (Llwydcoed) and the Gadlys Ironworks by a network of tramroads. Industrial settlement in the form of isolated rows: Shop Row, Shop Houses & Hill Top, is depicted in the area, some of which survives in an altered state. The Aberdare Tithe map (1844), shows much of the area is owned by Sir William Douglas (Llwyd Coed Estate), and leased to the Aberdare Iron Company, with a considerable area already tipped over by this date; extensive tips are indicated north and south of Hill Top, with the area east of Shop Houses only partially tipped over, including the then emerging tips at Ysguborwen Pit, set within a matrix of agricultural landscape (pasture, meadow and arable, as well as woodland). By the 1st edition OS the entire area has been covered by waste/workings.

The area has been partly landscaped and is very overgrown with some recent disturbance; dense bracken, Japanese Knotweed and scrub woodland vegetation predominate, and as a result visibility and site access was restricted and few of the individual features depicted on the 1st edition OS map were seen at the time of the site visit, The tramroad which runs through the area is in reasonable condition for its type. This formation, c1.5m wide, has a gravel makeup, and a ditch on the north side. A double width of track was noted at SN9970704271 (7.8m accuracy), where there is a passing point on the line. Further details of the individual extractive features within the area, largely gleaned from cartographic evidence, are presented in the gazetteer.

Table 9. Subsidiary point and polyline features within EA001B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.27	Limekiln, N of Hill Top	SN9968004601	Limekiln
EA001.28	Brick Works, N of Hill Top	SN9965704558	Brick Works
EA001.29	Coal and Ironstone Level, NE of Hill Top	SN9973804484	Level
EA001.30	Trackside feature, level, NE of Hill Top	SN9973604467	Structure
EA001.31	Weighing Machine, Hill Top	SN9968704446	Weighing Machine
EA001.32	Trackside feature, E of Hill Top	SN9984304481	Structure
EA001.33	Air Shaft, W of Croesdy	SN9988304422	Ventilation shaft

¹¹ Cynon Valley History Society, 2001, 199-247; Davies/Godsall List.

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.34	Weighing Machine, Hill Top	SN9955204422	Weighing Machine
EA001.35	Trackside feature, Hill Top	SN9954404408	Structure
EA001.36	Old Level, SW of Hill Top	SN9951604302	Level
EA001.37	Level, E of Shop Houses	SN9975904203	Level
EA001.38	Pumping Engine House, E of Shop Houses	SN9969404237	Pump House
EA001.39	Old Pit, S of Shop Houses	SN9951504149	Extractive Pit
EA001.40	Weighing Machine, Shop Row, N of Shop Houses	SN9959004270	Weighing Machine
EA001.41	Rectangular feature, Shop Houses	SN9954604200	Structure
EA001.42	Tramroad system and incline, Ysgubor-wen Pit	SN9988504174	Tramroad
EA001.43	Croesdy Patch, W of Croesdy Farm	SN9989504384	Patchworking
EA001.44	Ysgubor-wen Coal Pit, Ysgubor-wen	SN9990304180	Coal workings
EA001.45	Rectangular feature, Ysgubor-wen	SN9996904056	Structure
EA001.46	Level, Ysgubor-wen	SN9997704054	Level
EA001.47	Trackside building, Ysgubor-wen	SN9997003987	Building
EA001.48	Trackside building, Ysgubor-wen	SN9996103977	Building
EA001.62	Revetting, E of Shop Houses	SN9970704271	Revetment
EA001.97	Tramroad to Level, NE of Hill Top	SN9964504388	Tramroad

Table 10. NMR Registers within EA001B

Nprn	Name	NGR	Type
260024	BRYN DEFAID MINING REMAINS ¹²	SO0004	COAL MINE

Extractive landscape: Fothergill’s Patches (west), Bryn-defaid Patch and Tir-yr-argae: EA001C (see figure 4)

EA001C Archaeological significance: A/D

A very extensive linear extractive area centred approximately on SO0009805593, extending north of the former GWR Branch line at Ysgubor-wen, as far north as Bryn y Gwyddel. The area is known to have been worked as early as 1738, when the first recorded fatal mining accident in the Cynon Valley was recorded; a Daniel Simon killed by a roof fall,¹³ and in 1770 ironstone and coal was being worked in the area by George Bowser (Ironmaster).¹⁴

The Aberdare Tithe map of 1844 records the extensive holdings owned by Sir William Douglas, leased to the Aberdare Iron Company, as covered by tips (‘Rubbish’); these lie to the south and northwest of Dyllas, and include Bryn Defaid Patch, and extend as far east as Dyllas Drift Mine

¹² NMR register actually refers to general area of mining remains within EA001C; inaccurate NGR has distorted location.

¹³ The Davies/Godsall List; PRO, Wales 4(612)1.

¹⁴ The Davies/Godsall List; Rees, W, *Industry Before the Industrial Revolution*.

(in operation from the 1840s) and extend down the extent of the western boundary of the area to Tir-rhos and Tir-yr-argae. The original farmstead of Bryn Defaid (removed by the extension of Bryn Defaid Patch) is shown on the Tithe, the current Bryn Defaid Farm (shown on the 1st edition OS) being a replacement. Within the northeastern part of the extractive landscape, the Tithe map shows tips extending immediately north of Dyllas, the majority of the land here is recorded as mountain pasture and coedcae, again under the ownership of Sir William Douglas (Llwyd Coed Estate), as well as a certain Edward Morgan Williams and leased to various individuals. The main tramroad (EA001.86) connecting Bryn Defaid Patch and Fothergill's Patches to the Llwydcoed (Aberdare) Ironworks is depicted on the Tithe map, its route largely as shown on the 1st edition OS map (1886/1890). The Dyllas Drift, initially producing ironstone, was worked by the Gadlys Iron Company (Waynes up to 1865), transferring to Waynes Merthyr co. Ltd in 1877.¹⁵

The area takes in Bryn Defaid Patch (coal & ironstone) at the north with its engine house, internal tramroad and trackside feature, and the site of the Tir-yr-Argae Balance Pit (ironstone & coal) to the south. The area contains numerous quarries and levels and associated tips; these include sites known to have been both active and disused by 1886/1890 (1st edition OS map). An Old Shaft (with adjacent engine house depicted on 2nd edition OS), is depicted north of Dyllas, as well as other minor features on the 1st edition OS. The area was linked by tramroad to Aberdare Ironworks (Llwydcoed) and beyond. Settlement in the area is limited to the site of the former Tir-yr-Argae farmstead (depicted on 1st & 2nd edition OS, and replaced by Tir-ergyd Farm, set slightly to the north by the 3rd edition).

The northern part of area EA001C, part of Fothergill's Patches, has very mixed survival. In much of the area, the remains have been destroyed by forestry plantation, and to a lesser extent road construction, the terrace for a new farm track, and the dumping of modern tarmac material. Further south, the tips survive to a greater extent and remain as dominant landscape features, though generally covered in heather and bilberries. In this part of the area, the quarry face survives largely intact (EA001.72) and the routes of some of the tramroads are still visible as terraces, and a sunken formation serving the engine house NPRN 85104. To the far north of this part of the area, the levels and their associated tips survive well. Though not depicted on the 1st edition OS map, there is a possible level at SO0045206264 (6.9m accuracy) to the northeast of the engine house. A cutting faces west, with a slight gully running along the same alignment above the head of the cutting, which may be the collapse of underground workings, or possibly a tramroad. Some parts of this area of EA001C survive very well, such as EA001.74 and the engine house NPRN 85104. The central part of area EA001C, formerly Bryn Defaid Patch, though damaged by recent infilling works, survives, with impressive workings and quarry faces along its northern edge. The dominant surviving features for much of the area are the large, lobed tips, which are often visible from the tracks, and are generally heather-covered with sparse trees. The upper part of the area survives better, however, with a large amphitheatre-shaped ironstone & coal quarry (detailed on the 1st edition OS map (1886/1890, and subsequent editions), with associated tips to its east and extending to the south, and now with a largely level interior. This quarry has been recently partially backfilled; the upper, northernmost bay has been partially backfilled with modern debris and rubble. At the northwest extent of the main quarry, within a small embayment, a ledge/or bench terraced into the rock below the upper quarry face, survives. A small shallow cutting c0.5m deep is cut into this ledge/bench, and demonstrates the quarrying technique of cutting downwards from established level trenches or benches. The remains of a stepped long-wall gallery can be seen extending around the north side of the quarry. A linear

¹⁵ After the Davies/Godsall List.

gap/passage (first shown on the 2nd edition OS map of 1900, when the quarry was disused) at the west side of the quarry leads through to a further quarried area, again partially back-filled with modern waste material.

The southern part of EA001C, to the south of Dyllas, around Tir-yr-argae has generally been very badly damaged. The area has been largely reclaimed and levelled to provide improved agricultural land, though some tips remains notably the tips depicted on the 1st edition OS map in the area just north of the site of the balance pit EA001.23.

The area now partly landscaped and infilled, with some recent disturbance especially in the southern zone, contains a variety features with a wide range of survival/condition ratings. The significance of the area is considered to vary greatly over its range. The area would benefit from further sub-division into smaller zones of significance.

The area contains numerous individual features, many previously recorded by the RCAHMW and its sub-contractors through the Uplands Initiative. The most significant of the surviving sites, including RCAHMW entries, are detailed below, the descriptions of those NMR sites augmented during the course of the current survey are given in italics:

EA001.07, archaeological significance: B

The Engine House, Bryn Defaid Patch, a rectangular feature depicted on the 1st edition OS map (1886/1890), labelled as an Engine House, located on the west side of a north-south tramroad and former incline system serving the Bryn Defaid Patch workings. The feature survives as a roughly rectangular sunken area c3.8m by 4m and c1-1.5m deep, with some tumble in the interior, and small areas of stone walling visible under the dense undergrowth and ferns. The south side of the feature is defined by a stone wall, there are also traces of an entrance to the north. A long, shallow reed-filled rectangular feature, c1.5m wide, extends 9m north of the sunken area. The remains of a stone bank c0.5m wide and 0.1m high was noted along the north side. The features identified at the engine house site are likely to represent the remains of the brake wheel pit at the head of the former incline; the associated sunken area possibly the channel or path for the cables.

EA001.72, archaeological significance: B

A length of quarry face, and associated tips within the area of Fothergill's Patches depicted on the 1st edition OS map (1885). The quarry face survives, partially obscured by vegetation, along the eastern edge of the area adjacent to the B4276, Merthyr Road.

EA001.08, archaeological significance: B/C

A rectangular trackside feature at depicted on 1st edition OS maps (1886/1890), along the line of a tramroad running north-south through the area, serving Bryn Defaid Patch. This feature lies just to the south of Engine House EA001.07. The surviving remains comprise a small embanked feature roughly triangular in shape tapering to the south, defined by grassed-over stone banks, c0.3m high and vary between 0.5 and 1m in width, with a possible entrance on the south side. The banks are constructed of shale waste and there is no clear facing. The banks are well spread and have the appearance of material left over from either storage or processing, which has left the imprint of a former structure. This may represent the remains of a hut, shelter, or possibly a storage bin.

EA001.74, archaeological significance: B/C

An area of quarrying at Fothergill's Patches; spoil tips, with the quarry face, 6-7m high, defining the edge of the forestry plantation, facing north and northwest, depicted on the 1st edition OS map (1885) and labelled as an ironstone quarry. The tips lie downslope of the quarry face, and are small, random, short and lobed, rounded and interlocking, essentially a series of conjoined lobes, one with a deep open shaft/crown pit/bell pit, elliptical and c4-5m in diameter, at SO0037206344 (5.9m accuracy). Small-scale levels appear to have been driven into the base of the quarry face, one example at SO0033906316 (6.6m accuracy) is c1m wide and 3-4m in length, with voids at the base of the quarry face. There is also a small, sub-circular, D-shaped pit working, c3m by 3m adjacent to the quarry face at SO0033206321 (5.6m accuracy). Broken slabs of stone are visible at the base of the quarry face. There is a small curvilinear channel running in front of the quarry face, at SO0031706307 (5.7m accuracy) running to the west, c1m wide, c0.75m deep and c9m long, possibly the entrance to a small level feature. There is a deep gully running between the tips, at SO0035006331 (5.6m accuracy) depicted on the historic map, c1.5-2m wide and aligned westnorthwest. The area is well-vegetated with heather, bilberry, ferns, and a few small rowan and oak trees. The entrance to the quarry is a sunken track leading from a gap between the forestry planting at SO0035806339 (6.3m accuracy).

Nprn 85104 archaeological significance: A?/B

Bryn Defaid Colliery Engine House (Fothergill's Patches): No further information recorded (RCAHMW; NMR; Coflein). *This structure, not depicted on the 1st edition OS map (1885) (though the associated engine shaft is shown as "Old" on the 1st edition OS map), is first shown on the 2nd edition (1900/1904), but not named, set on a sub-rectangular terrace adjacent to an 'Old shaft. The field visit identified a massively constructed structure, c.16.40m north-south (max) by c.11.85m east-west (max), its north and west elevations slightly battered, 13 courses (min) c.5m in height, built of rusticated masonry (large dressed stone blocks), massive quoins to angles, its south and east sides built into the slope. The main part of the structure is L-shaped in plan, (approx basal measurements c.13.6m SSW-NNE (main axis) by c.9.4m WNW-ESE, cut in by c.2.4m at c.7.8 from the south elevation), with a narrow rectangular internal division (shown on the 2nd edition OS map), c.2.3m wide extending along the length of the east side, and a small rectangular projection (3.4m E-W by 2.5m N-S at the base) at the east side of its NNE wall, possibly the base of a chimney. The top of the structure provides an almost level platform; low rectangular footings (5.6m SSW-NNE by 3.8m WNW-ESE) were noted at the northern part of the L-shaped structure corresponding with instep. A square aperture was noted at the centre of the north elevation (W of the 'chimney' projection), possibly a horizontal beam slot. There is a substantial amount of collapse along the base of the north elevation. It appears that the east and south sides of the feature may have been deliberately damaged/robbed and are now steeply sloped. Recommendations: detailed topographic survey of the feature and its surroundings, elevation drawings/photographic survey; consider for scheduling.*

Nprn 88072, archaeological significance: B/C

Bryn-Defaid Patch (Coal and Ironstone Workings): No further information recorded (RCAHMW; NMR; Coflein). *Refers to general area. See EA001C.*

Nprn 260023, archaeological significance: B/C

Bryn Defaid Coal Mine: “Open-cast mine on Bryn Defaid. Record from AP” (RCAHMW; NMR; Coflein). *Refers to general area. See EA001C.*

Nprn 262368, archaeological significance: B/C

Bryn-y-Gwyddel, Level IV: “Level cut in E, located on E edge of conifer crop. Recorded on Provisional ed. OS. Waterlogged tramming entrance prevents access to level mouth; tramway running W now acts as watercourse draining level. Threat: Change of use Response: Watching brief Vegetation: Conifer” (RCAHMW; NMR; Coflein). *This level entrance is aligned roughly northeast-southwest, with an approach between the associated tips (NPRN 262371). The linear cutting runs through the middle of the area of tips, c1.5m wide at the base, and at least 1m deep, aligned northeast-southwest. At its northeast end (at SO0044506719 - 6.9m accuracy) the cutting curves to the east and the collapsed level entrance. As it approaches the site of the portal, the cutting is c2.5m in depth. This level is likely to be earlier than the level to the south (NPRN 262441), its tips are shown on the 1st edition map (1885), without tramming lines, the level site is no longer in evidence, whilst that to the south is shown complete with associated tramroad.*

Nprn 262370, archaeological significance: B/C

Bryn-y-Gwyddel, Level IV Tramway: “Tramway now carrying water flowing from level mouth in conifer crop to E along S side of extensive coal & ironstone tips. Channel embanked to 1m h on both side; base on tramway c.0.5m wide. Extends c.30m through unplanted area within 1970s forestry. Threat: Change of use Response: Watching brief Vegetation: Rough grass” (RCAHMW; NMR; Coflein).

Nprn 262371, archaeological significance: B/C

Bryn-y-Gwyddel, Coal & Ironstone Tips Area I: “Extensive area of tipping located on unplanted ground within forestry. Low wide-spread coal & ironstone tips include tramway on S side. Threat: Change of use Response: Watching brief Vegetation: Grass” (RCAHMW; NMR; Coflein). *These tips, associated with level NPRN 262368 are aligned roughly northeast-southwest, and have a more rounded profile than those to the south (NPRN 262372). They also appear to be butted by 262372, and are likely earlier in date.*

Nprn 262372, archaeological significance: B/C

Bryn-y-Gwyddel, Coal & Ironstone Tips Area II: “Extensive area of low, wide-spread tips located in clearing in forestry. Threat: Change of use Response: None Vegetation: Grass” (RCAHMW; NMR; Coflein). *The tips are aligned east-west and extend from level 262441, which appears to be later than level 262368; it is still shown as active on the 1st edition OS map (1885). The tips are fan-shaped and with a flat-topped profile (flatter topped than the tips 262371 adjacent to the north).*

Nprn 262376, archaeological significance: B

Bryn-Defaid Engine Shaft: “Capped shaft surmounted by mound of stone c.5m diam. within recently fenced area. Located S of engine house as on 1905 map. Stone mound surrounded by grassy spoil mound with collapsed hollow c.2m diam on S side. Threat: Change of use Response:

Ground survey Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Survives as described by the RCAHMW, though its actual location is 13m to the SSW of the given NGR. The feature is described as an 'Old Shaft' on the 1st, 2nd and 3rd edition OS maps (1885, 1900/1904, 1920), even on the 2nd edition which depicts the adjacent engine house (NPRN 85104), for the first time. There is a slight discrepancy between the location of the old shafts depicted on the 1st and 2nd edition OS maps; this might explain the 'collapsed hollow', noted by the RCAHMW, possibly the remains of an earlier abandoned shaft working.*

Nprn 262378, archaeological significance: B/C

Bryn-Defaid Spoil Tips II: “Extensive area of coal & ironstone tips as recorded on 1885/1905 OS maps. Grass covered tips in rough grazing, interrupted by modern paths/bike tracks. Threat: Change of use Response: Watching brief Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *The tips are well-preserved to the south of the reservoir, with elongated narrow tramming lines. They survive as shown on the 1st edition OS map (1885), and are well-vegetated with heather and bilberries. The route of the tramroad is preserved as a track.*

Nprn 262381, archaeological significance: B

Bryn-Defaid Engine Reservoir: “Sub-square structure recorded on 1885-1905 maps; appears to be a reservoir. No longer evident in area of disturbed tips. Threat: Change of use Response: Watching brief Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Survives in a drained state, between 1m and 1.5m deep. The embankment survives, and the outline as shown on 1st edition OS map is traceable. The interior of the reservoir remains damp. The banks are generally well-vegetated with some slight stock erosion on top.*

Nprn 262385, archaeological significance: B/C

Bryn-Defaid Patch I: “Large open quarry/ former ironstone mines worked as patching. Recorded on 1885 map, but currently subjected to land-filling. No associated features survive above surface within the quarry area. Threat: Landfill Response: Evaluate Vegetation: Grass” (RCAHMW; NMR; Coflein). *Refers to a general area. See EA001C.*

Nprn 262386, archaeological significance: B/C

Bryn-Defaid Patch II: “Coal & ironstone workings recorded on 1885 - 1905 OS maps. Now largely destroyed apart from spoil tips, which have been subjected to later quarrying & current landfill operations. Threat: Landfill Response: Evaluate Vegetation: Grass” (RCAHMW; NMR; Coflein). *Refers to a general area. See EA001C.*

Nprn 262447, archaeological significance: B

Bryn-Defaid Levelled Tips II: “Area of grass covered levelled tips, as recorded on 1905 map. Threat: None Response: None Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Not levelled, the tips survive in undisturbed grassed-over condition, with some mature trees growing from them. A drystone wall separates these tips from a track (former tramroad?) to the east. The tips depicted on the 1st edition OS map survive as then shown; early linear/lobed tips which appear to be associated with the earlier phases of Bryn-Defaid Patch/Quarry (located on the opposite side of the track).*

Nprn 262448, archaeological significance: B

Bryn-Defaid Levelled Tips III: “Area of grass covered levelled tips, as recorded on 1905 map. Threat: None Response: None Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *This area has not been totally levelled, the tips survive in a grassed over condition, in an enclosed*

area of mature trees. The tips depicted on the 1st edition OS map survive as then shown; early linear/lobed tips, which appear to be associated with the earlier phases of Bryn-Defaid Patch/Quarry (located on the opposite side of the track).

Nprn 262462, archaeological significance: B/C

Bryn-Defaid Spoil Tip: “Single spoil mound now overplanted with conifers; may denote the site of a level cut in alongside the stream. Threat: None Response: None Vegetation: Conifer” (RCAHMW; NMR; Coflein). *See EA001.74.*

Nprn 262463, archaeological significance: B/C

Bryn-Defaid Tips: “Extensive spoil tips rising to c.8m above track on their west side. Grassed-over tips damaged on interior of patches by earth moving as part of reclamation work. Threat: Land improvement/tipping Response: None Vegetation: Grass” (RCAHMW; NMR; Coflein).

Table 11. Subsidiary point and polyline features within EA001C

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.06	Ironstone and Coal Level, Bryn Defaid Patch	SO0014405734	Level
EA001.07	Engine House, Bryn Defaid Patch	SO0002105904	Engine House
EA001.08	Trackside feature, Bryn Defaid Patch	SO0002405891	Structure
EA001.09	Quarry entrance cutting, Bryn Defaid Patch	SN9989305391	Cutting
EA001.10	Square trackside feature, Bryn Defaid Patch	SO0010305701	Structure
EA001.11	Old Ironstone and Coal Level, N of Tir-erygd Bungalow, Bryn Defaid Patch	SN9999905432	Level
EA001.12	Siphon, N of Tir-erygd Bungalow, Bryn Defaid Patch	SO0002005386	Siphon
EA001.13	Trackside feature, W of Tir-erygd Bungalow, Bryn Defaid Patch	SN9997605375	Structure
EA001.14	Trackside feature, W of Tir-erygd Bungalow, Bryn Defaid Patch	SN9996905362	Structure
EA001.15	Air Shaft. S of Tir-erygd Bungalow, Bryn Defaid Patch	SO0002905290	Ventilation Shaft
EA001.16	Old Level, Bryn Defaid Patch	SO0003505285	Level
EA001.17	Old Level, Tir-yr-Argae, Tir-erygd	SN9995204998	Level
EA001.18	Old Level, Tir-yr-Argae, Tir-erygd	SN9995904911	Level
EA001.19	Coal Mine, Tir-yr-Argae, Tir-erygd	SO0010604885	Coal Mine
EA001.20	Structure, Tir-yr-Argae, Tir-erygd	SO0020504865	Structure?
EA001.21	Tir-yr-argae, Tir-erygd	SO0014004814	Farmstead
EA001.22	Weighbridge, Tir-yr-argae Balance Pit, Bryn Defaid	SN9986304738	Weighbridge
EA001.23	Tir-yr-argae Balance Pit, Tir-yr-Argae, Tir-erygd	SO0000204693	Balance Pit
EA001.24	Drift Mine, S of Tir-yr-Argae, Tir-erygd	SO0005404541	Drift Mine
EA001.25	Level, S of Tir-yr-Argae, Tir-erygd	SO0003804527	Level
EA001.26	Ironstone Level, S of Tir-yr-Argae, Tir-erygd	SN9999004529	Level
EA001.71	Structure, Fothergill's Patches	SO0038806207	Structure
EA001.72	Quarry face, Fothergill's Patches	SO0043706231	Quarry

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.73	Group of crown pit workings, Fothergill's Patches	SO0039506194	Extractive Pit
EA001.74	Quarry, Fothergill's Patches	SO0032706327	Quarry
EA001.75	Tramroad at coal level, Bryn Defaid Patch	SO0010305633	Tramroad
EA001.76	Crown pit workings, Tir-yr-Argae, Tir-eryyd	SN9995104989	Extractive Pit
EA001.84	Overbridge (site of), S of Dyllas Houses, Bryn Defaid Patch	SO0011205575	Bridge
EA001.85	Tramroad spur to quarry, W of Bryn Defaid Patch	SN9996805581	Tramroad
EA001.86	Tramroad, Bryn Defaid Patch	SO0008305886	Tramroad
EA001.87	Tramroad spur to level, Bryn Defaid Patch	SO0012805683	Tramroad
EA001.88	Tunnel, Bryn Defaid Patch	SN9995405644	Tunnel
EA001.89	Tramroad incline and tipping line, Bryn Defaid Patch	SO0002505881	Tramroad/Incline
EA001.90	Tramroad extension to Bryn-y-gwyddel	SO0038006254	Tramroad/incline
EA001.91	Tramroad spur to quarry, Fothergill's Patches	SO0038206176	Tramroad
EA001.92	Ironstone & coal level, Bryn-y-gwyddel	SO0042306608	Level
EA001.93	Trackway to Bryn Defaid and Bryn Carnau Farms, Bryn Defaid Patch	SN9988605960	Trackway
EA001.94	Tramroad at Level, NW of Tir-eryyd Bungalow, Bryn Defaid Patch	SN9998105378	Tramroad
EA001.95	Tramroad system, Tir-yr-argae Balance Pit	SN9971904660	Tramroad
EA001.96	Track to level, NNW of Tir-yr-argae Balance Pit	SN9994004823	Track/tramroad

Table 12. NMR Registers within EA001C

Nprn	Name	NGR	Type
85104	BRYN DEFAID COLLIERY ENGINE HOUSE (FOTHERGILL'S PATCHES)	SO00400622	ENGINE HOUSE
88072	BRYN-DEFAID PATCH (COAL AND IRONSTONE WORKINGS)	SO00030565	IRONSTONE WORKINGS
260023	BRYN DEFAID COAL MINE	SO0006	COAL MINE
262368	BRYN-Y-GWYDDEL, LEVEL IV	SO00460671	LEVEL
262370	BRYN-Y-GWYDDEL, LEVEL IV TRAMWAY	SO00430670	TRAMWAY
262371	BRYN-Y-GWYDDEL, COAL & IRONSTONE TIPS AREA I	SO00380665	SPOIL TIP
262372	BRYN-Y-GWYDDEL, COAL & IRONSTONE TIPS AREA II	SO00330659	SPOIL TIP
262373	BRYN-DEFAID N/S TRAMWAY (2)	SO00450639	TRAMWAY
262374	BRYN-Y-GWYDDEL, BRYN-DEFAID IRONSTONE TRAMWAY III	SO00330620	TRAMWAY
262376	BRYN-DEFAID ENGINE SHAFT	SO00390620	SHAFT
262377	BRYN-DEFAID SPOIL TIPS I	SO00480633	SPOIL TIP
262378	BRYN-DEFAID SPOIL TIPS II	SO00370611	SPOIL TIP
262380	BRYN-DEFAID ENGINE SHAFT STRUCTURE I	SO00440620	STRUCTURE

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Nprn	Name	NGR	Type
262381	BRYN-DEFAID ENGINE RESERVOIR	SO00420614	RESERVOIR ?
262382	BRYN-DEFAID TRAMWAY	SN99980556	TRAMWAY
262385	BRYN-DEFAID PATCH I	SO00050601	COAL WORKINGS;IRONSTONE WORKINGS
262386	BRYN-DEFAID PATCH II	SO00010582	COAL WORKINGS;IRONSTONE WORKINGS
262388	BRYN-DEFAID OLD LEVELS	SO00090571	LEVEL
262438	BRYN-Y-GWYDDEL, LEVEL III	SO00430675	LEVEL
262439	BRYN-DEFAID LEVEL III TRAMWAY	SO00390674	TRAMWAY
262441	BRYN-DEFAID 1885 TRAMMING LEVEL	SO00420665	LEVEL
262443	BRYN-DEFAID DOUBLE-INCLINED TRAMWAY	SO00440654	TRAMWAY
262444	BRYN-DEFAID RESERVOIR I	SO00470645	RESERVOIR
262446	BRYN-DEFAID E/W TRAMWAY III	SO00380616	TRAMWAY
262447	BRYN-DEFAID LEVELLED TIPS II	SN99850587	SPOIL TIP
262448	BRYN-DEFAID LEVELLED TIPS III	SN99840593	SPOIL TIP
262462	BRYN-DEFAID SPOIL TIP	SO00330629	SPOIL TIP
262463	BRYN-DEFAID TIPS	SN99930578	SPOIL TIP
262473	BRYN-DEFAID BUILDING	SN99990619	BUILDING
262557	DYLLAS COLLIERY TRAMWAY	SO00190534	TRAMWAY
262560	DYLLA DRIFT TRAMWAY III	SO00140556	TRAMWAY
262562	DYLLA DRIFT MINE TIPS I	SO00170543	SPOIL TIP
262563	DYLLA DRIFT ENGINE HOUSE	SO00240549	ENGINE HOUSE

Extractive landscape: Tre-Gibbon (north and south): EA001D & E (see figure 5)

EA001D & E Archaeological significance: C/U

The Aberdare Tithe map (1844) shows most of this area to have been under the ownership of the Aberdare Iron Company by the mid-19th century, and largely recorded as being under pasture at this time. The extraction in the southern part of the area appears to be the oldest; the workings appear to have advanced progressively northwards as the quarrying progressed. The working at Tre-Gibbon have been sub-divided into two sub-areas separated by an embanked minor road:

EA001D: a small sub-rectangular quarry (ironstone & coal) at SO0009805593, associated with workings further south (EA001E), formerly accessed at the south by tunnel under the minor road from Tre-Gibbon. Quarry faces to south, north and east, with tips to west. Area now fenced enclosures, and partly built over. The area, viewed from the adjacent road (not accessed as within private land), contains surviving quarry features, along with small low tips.

EA001E: a group of 3-4 quarries and associated tips, centred on SO0009805593: one of which is old (NW) by 1st edition OS, 2 named as quarries (ironstone & coal). Two quarries (central and NE) have internal tramming lines in place on 1st edition OS, that to NE associated with area EA001D to N). That to the S is crossed from NW to E and SE by 2 paths (former tram routes). These tramming lines and paths link up with a main N-S tramroad which extends along E

boundary of the area, linking to the Aberdare (Llwydcoed) and Gadlys Ironworks. The area also contains at least one old level (OS 1st edition). The area is now largely overgrown with some areas of limited recent disturbance. Larger features, such as tips and cuttings etc, were noted to survive in a very overgrown impenetrable state. The tips associated with the main quarried area at the south of EA001D were more accessible under cover of mature woodland; these remains appear to be quite early in date, and might warrant further survey.

The lines of the tramroad formations, notably the line of the tramroad and associated tipping lines, leading from area EA001D to associated tips further south within area EA001E remain traceable on the ground. The track which runs on the east side of the area preserves elements of the former tramroad, with remains of the formation fossilised within the current surface.

Table 13. Subsidiary point and polyline features within EA001D & E

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.53	Old Mine, Llwydcoed	SN9968505237	Mine
EA001.54	Old Level, Llwydcoed	SN9956704996	Level
EA001.55	Trackside structure, Llwydcoed	SN9960605177	Structure
EA001.79	Tramroad system, E of Tre-Gibbon, Llwydcoed	SN9957904910	Tramroad

Extractive landscape: Fothergill's Patches (east), Carn-y-frwydr: EA001F (see figure 6)

EA001F Archaeological significance: A/B

An area of quarries (including linear quarry trenches) and levels, with associated tips and an internal tramroad system located on the eastern edge of Fothergill's Patches on Waen-y-Gwair, and depicted on the 1st edition OS map (1886/1890). The Aberdare Tithe indicates this area was mountain pasture and Coedcae owned by Sir William Douglas, part of the Llwyd Coed Estate leased to John Rees and others during the mid-19th century. The Tithe map also depicts an early phase of workings at the south west corner depicting the main tip in the area (see EA001F4), and the course of Track, Tramroad Spur, EA001.81 (Nprn 262422).

The largest of the surviving extractive features is a quarry (ironstone) of several embayments extending roughly north-south, with associated tips to the west, and internal tramming lines to quarry face linked by tramroad to levels (ironstone & coal) within a linear cutting, and remnants of other quarries (ironstone & coal) to the northwest. The tramroad exits the area at the east on route to Aberdare and Gadlys Ironworks via Nant-y-Derlwyn. The 1st edition OS indicates two old levels (one marked ironstone & coal) and an Airshaft at the southwest of the area. The area is open with limited areas of recent disturbance. The cartographic analysis and fieldwork identified a number of extractive trenches and discrete areas or zones, as follows:

EA001F1 - (SO0124406347 (6.4m accuracy)) Small remnant of a larger linear trench (now reclaimed) including a section of northeast-southwest aligned quarry face with a small fingertip, and small linear tips downslope to the northwest. The former southeastern extent of this area has been lost to modern opencast operations, the area now forested. Surviving remnants of the tips associated with the former workings contour the hillside. A curved track runs into the upper end of the quarry from the northeast, on an east-west alignment.

EA001F2 - Exposed quarry face forming a scoop, labelled as an ironstone quarry on the 1st edition OS map. Contains level entrance 292418/EA001.02, open to the southsouthwest, with fingertips downslope. There are signs of levelling to create platform areas at the base of the working faces. A small ramp/causeway crosses the entrance to the quarry scoop at SO 01219 06161 (7.2m), c1m wide, 5m long, and running, slightly curving, from northwest-southeast. Linear cuts at the base of the quarry indicate the line of the tramroad NPRN 262420, c1.5m wide and forming a passing loop. On the floor of the cutting for the quarry entrance are two splayed drainage gullies, with a tip to the north, slightly revetted on its north side at SO0121606070 (5.9m). These gullies run north-south towards the tip, and may have extended further (now obscured by the tip?). They are embanked on the downslope side with a bank c2m wide between them; the upper ditch is c1.4m wide, whilst that on the lower side is less distinct. These drainage features, may represent the fragmentary remnants of a scouring system. The tips to the west side of the quarry scoop are steep-sided fingertips, with a narrow profile, now grassed-over. There are also two linear, narrow-profile tips to the east of the quarry cutting, aligned north-south, the southernmost of which retains indications of revetting along the tramline, c1m wide at the top and slightly splayed at the end. Extensive erosion of the slopes of both cuttings and tips, largely under acid grassland, was noted in the area.

EA001F3 - An area of quarrying with associated tips, tramlines running between them to access the quarry faces (example at SO0136005879 (6.2m)). The appearance of this area suggests that it may have been subject to scouring activity, channels are visible running down the quarry faces. The area upslope above this quarry may have been improved, it is now very flat and level, and a rapid walkover survey failed to identify scouring channels above the working faces, although a mossy linear trackway was located, paralleling the edge of the quarry on the south side. This may be a buried drainage ditch or backfilled gully, possibly indicating the location of the buried pipeline? Also above quarry, on its western side, is a depression which may be a pit or an area of collapse, c3m in diameter, at SO0135806077 (4.9m). This is above a dogleg cutting leading up to the quarry face which may indicate the presence of a level entrance in the former quarry face, suggesting that this feature represents the collapse of underground workings.

EA001F4 - An area of levels and fingertips, depicted on 1st edition OS maps and visible on APs. The tips are extant and the entrance cuttings associated with the levels survive, but none of the level portals now survive. There is a small level area (at SO0105505836 (3.5m accuracy), where a short vertical length of Fe pipe set in concrete was noted; this feature, a test point to test ground/water contamination, relates to the adjacent landfill site. This area has been recorded by the RCAHMW under NPRN 262298.

The extractive area EA001F contains numerous individual features, many previously recorded by the RCAHMW and its sub-contractors through the Uplands Initiative. The most significant of the surviving sites, including RCAHMW entries, are detailed below, the descriptions of those NMR sites augmented during the course of the current survey are given in italics:

EA001.82, archaeological significance: A?/B

A small stone arched tramroad bridge carrying an E-W aligned tramming line (to waste tip) over quarry tramroad (aligned N-S at this point) at Fothergill's Patches depicted on 1st edition OS map (1881). The feature survives in good condition, its stone arches intact.

EA001.83, archaeological significance: A?/B

A small stone arched tramroad bridge carrying E-W aligned tramming line (to waste tip), which divides in two at this point, over quarry tramroad (aligned SE-NW at this point) at Fothergill's Patches depicted on 1st edition OS map (1881). The feature survives, though damage has occurred to the arch on the SE side, and the NW side appears to have partially collapsed.

EA001.80, archaeological significance: B

A network of tramroads depicted on the 1st edition OS maps (1881,1886/1890) connecting a group of quarries (ironstone & coal), part of Fothergill's Patches, located southwest of Carn-y-frwydr, to the main tramroad network associated with Aberdare Ironworks to the southwest.

EA001.02, archaeological significance: B/C

A group of level entrances depicted on 1st edition OS mapping (1875), part of the wider extractive landscape at Fothergill's Patches. A single partially backfilled level entrance, cut into west-facing quarry face EA001.02, survives. Recorded by the RCAHMW under NPRN 262418 (given NGR incorrect).

EA001.59, archaeological significance: B/C

Small hut at Fothergill's Patches defined by ephemeral banks on the northwest, northeast and southwest sides, with a very slight bank on the southeast side, most clearly defined on the northwest side. The banks of this structure have been cut by a track; a slight linear depression runs through it. The northwest bank is c0.6m high, max 3m wide, with the other more ephemeral banks being spread to c1m wide. The overall structure is max 5m wide, 16m long, with the southeast side defined by a very ephemeral bank. The structure is set on a slight platform cut into the slope.

EA001.81, archaeological significance: B/C

A curving track, former tramroad spur at Fothergill's Patches depicted on the 1st edition OS maps (1886/1890) linking Fothergill's Level 1 (EA001.03, 262458) to the wider tramroad network. Feature aligned northwest-south east within area EA001F. Partly set on embankment EA001.60, as it accesses tips to the south, associated with the quarries to the east (262460).

EA001.61, archaeological significance: B/U

Embanked sub-rectangular platform structure, c4m wide by c6m long (max), at Fothergill's Patches, well-vegetated with bracken. There are indications of footings on the southwest side. This structure is located at the base of a cutting, the southeasternmost of group EA001.04, which may have provided access to a now-collapsed level entrance, located above a boggy area. The banks of the structure survive to 0.6m in height and are spread to c1m in width at the top. There are traces of a possible entrance on the southwest side.

Nprn 262418, archaeological significance: B/C

Carn-y-Frwydr, Levels: "Area of levels recorded on 1905 map. Sited on E facing slopes below parish boundary. Levels are cut in NE, but only located by arrangement of spoil. Area has been subjected to later quarrying and land/drainage improvement, presumably prior to opencasting Threat: Land improvement Response: None Vegetation: Rough grass" (RCAHMW; NMR; Coflein). *See EA001.02 for further details.*

Nprn 262419, archaeological significance: B

Carn-y-Frwydr, Ironstone Tramway I: “Route of tramway connecting upper open ironstone workings to Penwaen/ Dyllas tramways to the south. Located as broad level grass-covered area running N/S through tips. Tramway recorded 1885 map; rails removed by 1905. Threat: Land improvement Response: Preserve Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Survives as a grassed-over, reed-filled linear cut between tips, c1.5m wide, with a ditch on either side. A straight section running north-south is slightly embanked. A 3m length of tumbled drystone revetting survives along one side of the line of the tramroad, while there is also a secondary tipping line at SO 01348 05821 (6.8m accuracy), c0.6m high, crossing the main line (depicted on the 1st edition OS map (1881)) to a small tip on the southwest side. A series of culverts appear to have carried the tramroad over the gullies between tips, the abutments of which survive, one example at SO 01335 05861 (8.7m accuracy) has four courses of drystone revetting on the south side, with remnants on the north side. The abutments for a pair of splayed crossings visible on the 1st edition OS map (1881) survive at SO 01307 05901 (7.1m accuracy), with 6 courses of revetting surviving on the southeast side, 0.6m high and 1.6m in length. There is no revetting surviving on the north side, and its dimensions on this side are indeterminate.*

Nprn 262420, archaeological significance: B

Carn-y-Frwydr, Ironstone Tramway II: “Route of tramway; part of tramway 262419 connecting upper open ironstone workings to Penwaen/ Dyllas tramways to the south. Located as level strip running N/S through tips. Tramway recorded 1885 map; rails removed by 1905. Threat: Land improvement Response: Preserve Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Lies within GGAT 80 Year 6 area EA001F2. Linear cuts at the base of the main quarry in this area indicate the line of the tramroad c1.5m wide and forming a passing loop. Some revetting survives along parts of the length of the tramroad, though it is eroded on the downslope side of the area, and appears to be cut by a gully which is likely a seasonal streambed.*

Nprn 262422, archaeological significance: B/C

Carn-y-Frwydr Ironstone Tramway IV: “Route of tramway located as level strip running N/S through tips. Connect coal & ironstone workings north to meet main tramway 262419. Tramway recorded 1885 map; rails removed by 1905. Threat: Land improvement Response: Preserve Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *The grassed-over tramroad embankment, running roughly E-W, c1m wide, but varying along its length, survives, with a ditch on the uphill side, and runs into a pond at one end. Secondary tipping lines are visible coming off of the main line at various points. Associated with this tramroad is a section of drystone revetting, (for a culvert?) at SO 01053 05885 (6.1m accuracy) across a ditch at a junction between this and another tramroad. This revetting survives to 3-4 courses, 0.6-0.7m high, and 3.3m long.*

Nprn 262460, archaeological significance: B

Carn-y-Frwydr, Ironstone Workings: “Extensive area of ironstone workings located as 'patches' or open workings; recorded as disused quarried on 1905 map. Area of c.250m extent of disturbed grass-covered tips & recent drainage cuts. Open quarrying cut deep into east facing slopes. Threat: Change of use Response: Preserve Vegetation: Grass” (RCAHMW; NMR; Coflein). *See EA001F3 for further details.*

Table 14. Subsidiary point and polyline features within EA001F

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.01	Coal Mine, Fothergill's Patches, Waun-y-gwair	SO0112206180	Coal Mine
EA001.02	Levels, Fothergill's Patches, Waun-y-gwair	SO0124806210	Level
EA001.03	Level, Fothergill's Patches, Waun-y-gwair	SO0106205892	Level
EA001.04	Old Level, Fothergill's Patches, Waun-y-gwair	SO0096005781	Level
EA001.05	Ironstone and Coal Level, Fothergill's Patches, Waun-y-gwair	SO0092605676	Level
EA001.56	Structure, Fothergill's Patches, Carn-y-frwydr	SO0130206033	Structure
EA001.57	Pit/shaft, Fothergill's Patches, Carn-y-frwydr	SO0132106309	Pit/shaft
EA001.58	Leats/drainage gullies, Fothergill's Patches, Carn-y-frwydr	SO0133106305	Leat
EA001.59	Small hut, Fothergill's Patches, Carn-y-frwydr	SO0137506110	Structure
EA001.60	Tramroad Embankment, Fothergill's Level, Carn-y-frwydr	SO0104505867	Embankment
EA001.61	Plafom structure in level cutting, Fothergill's Patches, Carn-y-frwydr	SO0096105781	Structure
EA001.80	Tramroad system, Fothergill's Patches	SO0119405996	Tramroad
EA001.81	Track (Tramroad spur), Fothergill's Patches	SO0105705862	Tramroad
EA001.82	Tramroad bridge, Fothergill's Patches	SO0134305810	Bridge
EA001.83	Tramroad bridge, Fothergill's Patches	SO0130305893	Bridge

Table 15. NMR Registers within EA001F

Nprn	Name	NGR	Type
262292	CARN-Y-FRWYDR, DRAINAGE GULLEYS	SO01290614	DRAINAGE CHANNEL
262293	CARN-Y-FRWYDR, SHAFT	SO01250619	SHAFT
262294	NANT-Y-DERLWYN, AIR SHAFT	SO01180574	VENTILATION SHAFT
262295	NANT-Y-DERLWYN, RESERVOIR	SO01090579	RESERVOIR
262298	NANT-Y-DERLWYN, SPOIL TIPS	SO01150582	SPOIL TIP
262299	NANT-Y-DERWLYN, SHAFT I	SO012057	SHAFT
262300	NANT-Y-DERLWYN, SHAFT II	SO01230571	SHAFT
262418	CARN-Y-FRWYDR, LEVELS	SO01300622	LEVEL
262419	CARN-Y-FRWYDR, IRONSTONE TRAMWAY I	SO01310588	TRAMWAY
262420	CARN-Y-FRWYDR, IRONSTONE TRAMWAY II	SO01200609	TRAMWAY
262422	CARN-Y-FRWYDR IRONSTONE TRAMWAY IV	SO01070583	TRAMWAY
262458	FOTHERGILL'S LEVEL I	SO01040587	LEVEL
262459	FOTHERGILL'S LEVEL II	SO01240582	LEVEL
262460	CARN-Y-FRWYDR, IRONSTONE WORKINGS	SO01370593	IRONSTONE WORKINGS
262461	FOTHERGILLS TRAMWAY I	SO01160589	TRAMWAY

Extractive landscape: Gelli-isaf: EA001G (see figure 7)**EA001G Archaeological significance: D**

A small rectangular quarry located at SO0009805593 to the south of Gelli-isaf farm, and marked on the 1st edition OS map as ‘Old Quarry (ironstone)’ with main quarry face to the south, and a shorter face to the west. The mid-19th century Aberdare Tithe map shows this as the site of a farmstead, Ty Yorum, owned by the Honourable Robert Henry Clive, and leased to a John Thomas; the farmstead appears to have been removed by the quarrying later shown on the 1st edition OS map (1868). The interior of the quarry is shown possibly flooded. The associated tips are shown ranged to the north and east (1st edition OS map 1868). The interior of the quarry has been infilled and landscaped and returned to agricultural use, though the location of the quarry faces can be traced as a slight linear scarp. Most of adjacent tips to the east have been lost to a recent road scheme (by-pass, those to the south are now partly reclaimed).

Table 16. Subsidiary point and polyline features within EA001G

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.98	Old Quarry, S of Gelli-isaf	SN9912304115	Quarry

Extractive landscape: Mountain Pit: EA001H (see figure 8)**EA001H Archaeological significance: B**

Mountain Pit (coal) located at SO 01698 05047 on the southwest facing slopes of Mynydd Aberdar is shown on the 1st edition OS map (1881) with its shaft and airshaft noted among a small group of features (which included a substantial rectangular structure at the north of the group) north of the engine house at the head of a northwest-southeast aligned incline which formerly led to Blaennant Balance Pit, to the southeast, and provided access beyond to Abernant Ironworks. The engine house (EA001.69) at Mountain Pit still stands, and is an impressive rusticated masonry structure with holding down bolts and brick arched flue/culvert. Close by to the northeast of the engine house is a sub-rectangular tank, or header tank. The latter forms part of a wider leat system associated with Blaennant Balance Pit.

A large lobed tip stood to the south of the pithead at Mountain Pit, extending down the western side of the incline; this feature has been removed by opencast/reclamation works. Whilst the tip has been reclaimed, the remains of the substantial engine house and other features survive, partly obscured by bracken; further structures lie to the southeast of the engine house obscured by vegetation, with embanked features and low footings indicated. Much of the incline route has been disturbed (and reconstructed as a track) by opencast workings. The area around the engine house has been disturbed, however a number of embanked features survive. The profile of the slopes above the complex to the east is irregular and may have been patchworked. A number of small isolated features, trial levels are located on the slopes to the east, beyond the area.

The most significant of the surviving sites, including RCAHMW entries, are detailed below, the descriptions of those NMR sites augmented during the course of the current survey are given in italics:

EA001.69, archaeological significance: A?/B

The engine house complex at Mountain Pit (includes NPRN 262431?). A linear group of rectangular structures on the east side of the incline head depicted on the 1st edition OS map (1881), which shows a main structure building with a smaller structure to the south and small appendages to the ends. Adjacent to the northeast side of the group, the mapping depicts a rectangular feature; the field visit identified this as a large sunken area with 3 parallel linear channels entering from the south (possibly the same feature as Nprn 262431?). The main structure survives to c1.8m in height (10 courses visible), and measures c10m in length by c4.5m, the massive bank (c. 1m high on west side) on which it sits appears to have been truncated and previously extended further to the northwest and southeast. The masonry of the structure has been damaged, especially at the north end, where the rubble core is now visible. There is evidence that the structure has been altered; several additions were visible to the east side, culminating in an arched culvert or flue, over 1m in depth and c0.75m wide, constructed of yellow unfrosted brick. This culvert or flue extends the length of the northeast side of the structure. Encased within the southeast elevation is a square Fe tank, 92cm wide and 77cm high, its top exposed for 85cm, with a capped opening, 21cm in diameter, on its southeast side. The top of the tank has 2 circular openings (the larger 18cm in diameter, and the smaller 12.3cm, both originally capped), and a larger capped opening, over 40cm in diameter, which is partially overgrown and covered by brick. Around the openings are holes (4 around the smaller hole, and 6 around the larger) for square-section bolts which would have originally secured the capping. Protruding c0.25m from the top of the structure is are 3 parallel rows of screw-topped holding down bolts (8 or more). There is a linear northwest-southeast aligned channel between the outer two rows, and, a further 3 bolts on the northeast side. Roughly 5m to the northwest of the main structure, at ground level, are a further 4 holding down bolts. The feature would benefit from a full measured and interpretive survey.

EA001.63, archaeological significance: B/C

Rectangular feature depicted on 1st edition OS maps (1881), on the slopes above Mountain Pit, with an entrance leat in the east corner, and exit leat in the south corner. Possibly a holding or header tank for the workings, the exit leat runs down to the main building at the mine, then turns to the east to run parallel with the incline.

EA001.65, archaeological significance: B/U

A small rectangular shaft-like feature, c4.5m square, located to the northwest of the engine house at Mountain Pit, with banks at the north, east and west sides, open on the south side. An L-shaped depression, c1.5m wide, encloses the north and east sides. This possibly equates to one of a group of small features depicted on the 1st edition OS map (1881), possibly that referred to as "shaft". Possibly the same as NPRN 262332.

EA001.68, archaeological significance: B/U

Two small rectangular features depicted on the 1st edition OS map (1881) at the head of the incline which serves Mountain Pit. The features appear to have been heavily disturbed on the surface, buried remains may survive.

Nprn 262332, archaeological significance: B/U

Mountain Pit Engine Shaft: "Collapsed rectangular hollow; possible double-cage shaft; N of linear channels, presumed to be boiler foundations. Threat: Change of use Response:

Preserve/ground survey/watching brief Vegetation: Rough grass” (RCAHMW; NMR; Coflein).
Same as EA001.65?

Nprn 262431, archaeological significance: A?/B

Mountain Pit Boiler House: “Foundations of presumed boiler house adjoins E side of EH. 2 linear brick channels c. 0.55m wide at base x 1m high x 9m long under rough grass. Channels aligned to EH tunnel with pit located N side. Threat: Land improvement Response: Preserve/building recording/ ground survey/ watching brief Vegetation: Rough grass” (RCAHMW; NMR; Coflein). *Part of EA001.69?*

Table 17. Subsidiary point and polyline features within EA001H

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA001.63	Holding tank, Mountain Pit?	SO0172705133	Reservoir
EA001.64	Rectangular feature, Mountain Pit	SO0168905129	Structure
EA001.65	Shaft, Mountain Pit	SO0168405116	Mine Shaft
EA001.66	Air Shaft, Mountain Pit	SO0167705111	Ventilation Shaft
EA001.67	Rectangular feature, Mountain Pit	SO0167605116	Structure
EA001.68	Twin buildings, Mountain Pit	SO0169005108	Buildings?
EA001.69	Engine House, Mountain Pit	SO0170005103	Engine House
EA001.77	Incline, Mountain Pit	SO0177904979	Incline

Table 18. NMR Registers within EA001H

Nprn	Name	NGR	Type
262332	MOUNTAIN PIT ENGINE SHAFT	SO01680512	SHAFT
262428	MOUNTAIN PIT RESERVOIR	SO01640516	RESERVOIR
262429	MOUNTAIN PIT ENGINE HOUSE I	SO01660510	ENGINE HOUSE
262431	MOUNTAIN PIT BOILER HOUSE	SO017051	BOILER HOUSE
262433	MOUNTAIN PIT SPOIL TIPS	SO01680503	SPOIL TIP

Blaennant (Ffynnon Lassa)

Extractive landscape: Blaennant: EA003 (see figure 9)

EA003 Archaeological significance: A/B

An extractive area located at SO0225004412 on the southwest facing slopes of Twyn Blaennant. The Aberdare Tithe map (1844) shows the Reservoir (EA003.13) and leat system associated with Blaennant Balance Pit, and the initial phases of the Quarry at Ffynnon Lassa (Nprn 262598), with the NW-SE aligned quarry face set immediately NE of the location of the access track/tramroad to the quarry (EA003.15, Nprn 262599). The quarry (EA003.15, Nprn 262599), located within 'Quarry Field', formed part of the Gwryd holding owned by the Marquis of Bute and leased to Thomas Pugh. The Bute Estate owned all the land within the extractive area during the mid-19th century, the majority holding being Blaennant itself then leased to an Evan Howell, at the time set to pasture and meadow.

The 1st edition OS map depicts a number of features associated with Blaennant Balance Pit, including the main incline to Abernant (site of, lies just south of the area), an associated reservoir (EA003.13) to the north and leat system (including the reservoir sluice), at the north of the area. Also an Old Level to the southeast of the reservoir, and to the northwest of the farmstead of Blaennant a small quarry scoop and tip, while a curvilinear quarry face lies to the east of Blaennant farmstead and the track, with a linear tip extending south.

At the south of the area is a further reservoir, a well to the south, and large quarry (ironstone), NPRN 262598, to the southeast, connected to the head of the Blaennant Incline by tramroad (roughly aligned SE-NE). This Quarry retains a number of features including tramroad access, tramming and tipping lines, tips, shelters, a level portal, and possible traces of scouring. A small isolated quarry (ironstone), probably a trial working, lies further to the north.

Whilst the site of the Blaennant Balance Pit and Incline has been reclaimed, the reservoir and extractive features to the north and east survive, partly in an overgrown state (bracken/brambles). The main quarry and reservoir to the southeast also survive in good condition, as does the outlying smaller quarry (the quarry has been slightly extended at a later date). The most significant of the surviving sites, including RCAHMW entries, are detailed below, the descriptions of those NMR sites augmented during the course of the current survey are given in italics:

EA003.11, archaeological significance: A?/B

A level and entrance cutting, the stone arched survives cut into the north-west facing slope. There are revetted wing walls to either side of the portal. Large stone blocks partially fill the entrance cutting.. The portal is c.1.3m wide, with a height of c.2m, though it is partly obscured by tumble. The north wing wall is 5-6 courses, c1m high, and constructed of large, smooth, rounded boulders, suggesting that it may have been constructed early in the sequence, possibly prior to the quarrying activity. An associated linear spoil tip lies to the west, its western end at SO0226504174 (5.2m accuracy).

EA003.18, archaeological significance: A?/B

Quarry (Ironstone) depicted on 1st edition OS map (1868), extended at southeast corner by 1900 (2nd edition OS map), disused by 1919 (3rd edition OS map). The quarry is shown connected by

tramroad (now a track) to Blaennant Balance Pit and Incline. The tramroad (see EA003.15, 262599) leaves route of modern track, which continues to the southeast, to enter the quarry area to the east between tips, the workings form 3 large embayments. There are narrow tipping lines to the tips which lie downslope west of the entrance to the quarry. Small tramming lines also survive towards the quarry faces, and small piles of waste and quarried blocks were noted in the quarry interior. Within the interior linear fingertips extend towards the quarry entrance. The quarry has been partly colonised by mixed deciduous woodland, and is generally well vegetated with heather, though the quarry faces remain visible and exposed on the east side. Piles of stone suggest on-site processing. There is a possible ephemeral channel and bank, possibly associated with scouring, along the upper edge of the northern quarry face; this survives in places as the quarry face has been progressively cut back (the south eastern most embayment has a different vegetation and it is known from cartographic evidence that this relates to a later extension to the quarry (probably employing different techniques). South of the main quarry waste tips appear to have been tipped against, and partly over a pre-existing drystone field boundary wall at SO0237504154 (8.6m accuracy), along the south-eastern edge of the quarry area. A further quarry face (facing southwest, extending northwest-southeast) was noted within the area of tips. This quarry face had evidence of short lengths of drystone walling set at a right angle to the base of the face, which form small working areas/windbreaks. To the northwest at the base of the tips is an intact level portal (see EA003.11) and a partially overgrown level area with numerous small tips and amorphous humps and bumps.

EA003.05, archaeological significance: B/C

Reservoir, located to the S of Ffynnon Lassa, Twyn Blaen-nant, part of the system, which supplied water to Abernant Ironworks and possibly the nearby Blaen-nant Incline. The outflow remains as it is shown on the 1st edition OS map (1868). The flat-topped embankment is steep-sided and heavily vegetated with bracken and gorse. Same as Nprn 262597.

EA003.08, archaeological significance: B/C

A drystone structure, possibly a shooting butt, built into and against spoil on the south facing side of a tip in quarry 262598. The walling on the south side is curved, with a straight wall to the north. It is sub-rectangular in shape, and the outer wall is bowed out. The external length of the structure is 2.9m, while the rear wall is 1.98m long. The rear wall, 9 courses high (c0.7m), is revetted against the slope. The curved front wall on the south side is 0.8m high, standing to 11 courses, and 3.1m long. The entrance cuts through embanked spoil, and is c1.3m wide and 3.1m long. The spoil has been used as batter for the south wall.

EA003.12, archaeological significance: B/C

The track associated with level EA003.11, which runs to the west from the level portal on a curved course eventually extending to the north to join a track/tramroad network accessing the general area. An associated zig-zag path (not visited) leading to the main N-S track/tramroad leading to Blaen-nant was also noted to the west on aerial photographs.

EA003.13, archaeological significance: B/C

Reservoir depicted on the 1st edition OS map (1881), serving Blaennant Balance pit and the associated incline. Survives as shown on the 1st edition OS map (1881). Grass-covered embankment. Probably the same as NPRN 262596 Blaen-nant Reservoir 1 (NGR SO02090445), which appears to have been previously mislocated by an erroneous NGR (not given below for this reason).

EA003.15, archaeological significance: B/C

A tramroad (same as NPRN 262599) depicted railed on the 1st edition OS map (1868) extending from SO0238304196 within the southern part of quarry Nprn 262598, running northwest to cross track EA003.03 south of Blaennant at SO0223504452 before heading westnorthwest to a junction at c.SO0212604524 with incline EA001.77, and linking to Blaennant Balance Pit and the main Blaennant incline. The southern extent of the feature within the quarry is altered and extended by 1900 (2nd edition OS map); a spur is then shown extending from SO0232104207 west to the end of a tip (at SO0229404214), while the eastern end of the tramroad has been extended south east from c.SO0235104196 to turn north in a 'hooked' curve to serve quarry faces at SO0242104210, the same arrangement is shown on the 3rd edition OS map (1919), by which time the quarry is disused. The formation is built out over the slope and scarped into the hillside by a depth of c.2m. The maximum width of the whole formation is c3-4m, but does vary. Several stone sleeper pads are visible, there are 4 in close proximity, which show signs of wear, at SO0227604308 (8.8m accuracy). The pads are set c.1m apart, c0.4 in length by c0.2m. An area of wear, 0.1m by 0.2m, was noted on one of the pads. The tramroad formation survives best in the area east of track EA003.03 as it approaches the quarry, though it is heavily rutted in places; flat-laid stones are visible at the base of the ruts.

Nprn 262597, archaeological significance: B/C

Blaen-Nant Reservoir II: "Reservoir dammed on west side, as recorded on 1885 OS map; now intact and in use for private fishing. Threat: Change of use Response: Preserve Vegetation: Rough grass" (RCAHMW; NMR; Coflein). *Same as EA003.05.*

Nprn 262598, archaeological significance: A?/B

Blaen-Nant Quarry IV: "Intact but overgrown open quarry located on moorland slopes. Appears to have been linked to Blaen-nant Colliery by tramway system, now evident as tracks. Threat: None Response: None Vegetation: Rough grass" (RCAHMW; NMR; Coflein). *The tramroad (see EA003.15, 262599) leaves route of modern track to enter the quarry area to the east between tips, the workings appear to form 3 large embayments. There are narrow tipping lines to the tips which lie downslope west of the entrance to the quarry. Small tramming lines also survive towards the quarry faces, and small piles of waste and quarried blocks were noted in the quarry interior. Within the interior linear fingertips extend towards the quarry entrance. The quarry has been partly colonised by mixed deciduous woodland, and is generally well vegetated with heather, though the quarry faces remain visible and exposed on the east side. Piles of stone suggest on-site processing. There is a possible ephemeral channel and bank, possibly associated with scouring, along the upper edge of the northern quarry face; this survives in places as the quarry face has been progressively cut back (the south eastern most embayment has a different vegetation and it is known from cartographic evidence that this relates to a later extension to the quarry (probably employing different techniques). South of the quarry the waste tips appear to have been tipped against, and partly over a pre-existing drystone field boundary wall at SO 02375 04154 (8.6m accuracy).*

Nprn 262599, archaeological significance: B/C

Blaen-Nant Quarry Tramway: Tramway now in use as a grassy track. Appears to have connected quarry with Blaen-nant Colliery, as recorded on 1905 map. Threat: None Response: None Vegetation: Rough grass" (RCAHMW; NMR; Coflein). *The formation, c3-4m in width, is built out over the slope and scarped into hillside by a depth of c.2m. Several stone sleeper pads are visible, there are 4 in close proximity, which show signs of wear, at SO0227604308 (8.8m accuracy). The pads, c0.4 in length by c0.2m, are set c.1m apart. An area of wear, 0.1m by*

0.2m, was noted on one. The tramroad formation is now heavily rutted in places, with flat-laid stones visible at the base of the ruts. See also EA003.15.

Table 19. Subsidiary point and polyline features within EA003

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA003.01	Workings, N of Blaen-nant, Twyn Blaen-nant	SO0226204743	Open cast mine
EA003.02	Quarry face, E of Blaennant, Twyn Blaen-nant	SO0225404566	Quarry
EA003.03	Track, Twyn Blaen-nant	SO0212104370	Trackway
EA003.04	Valve house/slucie house, Reservoir S of Ffynnon Lassa, Twyn Blaen-nant	SO0206604258	Structure
EA003.05	Reservoir, S of Ffynnon Lassa, Twyn Blaen-nant	SO0209304270	Reservoir
EA003.06	Linear drystone feature, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0235204240	Structure
EA003.07	Shaft/pit, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0235804255	Pit?
EA003.08	Drystone structure, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0234904251	Structure
EA003.09	Field boundary/sheepfold, Twyn Blaen-nant	SO0234604137	Wall
EA003.10	Rough stone structure, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0233204194	Structure
EA003.11	Level portal, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0229304172	Level
EA003.12	Track, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0224804178	Trackway
EA003.13	Reservoir, Blaen-nant, Twyn Blaen-nant	SO0209104584	Reservoir
EA003.14	Marshalling yard, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0225504243	Marshalling yard
EA003.15	Tramroad to quarry SE of Blaen-nant, Twyn Blaen-nant	SO0227104357	Tramroad
EA003.16	Rectangular feature, quarry SE of Blaen-nant, Twyn Blaen-nant	SO0237104188	Structure
EA003.17	Small quarry, SE of Blaen-nant, Twyn Blaen-nant	SO0240604426	Quarry
EA003.18	Quarry, SE of Blaen-nant, Twyn Blaen-nant	SO0235904212	Quarry
EA003.19	Quarry scoop, NNW of Blaen-nant, Twyn Blaen-nant	SO0220504685	Quarry

Table 20. NMR Registers within EA003

Nprn	Name	NGR	Type
262302	BLAEN-NANT STRUCTURE	SO02220455	STRUCTURE
262571	MOUNTAIN PIT AIR SHAFT I	SO02130474	VENTILATION SHAFT
262572	MOUNTAIN PIT AIR SHAFT II	SO02080473	VENTILATION SHAFT
262573	MOUNTAIN PIT AIR SHAFT III	SO02080472	VENTILATION SHAFT
262581	BLAEN-NANT FARMSTEAD	SO02230457	FARMSTEAD
262582	BLAEN-NANT ENCLOSED FIELDS	SO02220459	ENCLOSURE
262583	BLAEN-NANT QUARRY II	SO02260457	QUARRY
262587	BLAEN-NANT TIPS I	SO02180461	SPOIL TIP

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Nprn	Name	NGR	Type
262589	BLAEN-NANT LEVEL	SO02130464	LEVEL
262590	BLAENANT TIPS TRAMWAY	SO02080461	TRAMWAY
262592	BLAEN-NANT DRIFT	SO02200447	LEVEL
262593	BLAEN-NANT TIPS TRACK	SO02160453	TRACKWAY
262594	BLAEN-NANT TIPS II	SO02190451	SPOIL TIP
262597	BLAEN-NANT RESERVOIR II	SO02090428	RESERVOIR
262598	BLAEN-NANT QUARRY IV	SO02350423	QUARRY
262599	BLAEN-NANT QUARRY TRAMWAY	SO02280429	TRAMWAY
262600	BLAEN-NANT QUARRY III	SO02390442	QUARRY
262601	BLAEN-NANT LEVEL II	SO02180464	LEVEL
262602	BLAEN-NANT LEVEL I	SO02190468	LEVEL

Pen-y-waen**Extractive landscape: Cwm Nant-yr-Hwch, Pen-y-waen: EA004 (see figure 10)****EA004 Archaeological significance: C/D**

An area of early ironstone patch working and tips located at SN9837604661 within the stream valley of Cwm Nant-yr-Hwch (the western extent of the workings, probably the more interesting, has been lost to recent road building and landscaping). The Aberdare Tithe (1844), indicates the extractive area formed part of two holdings during the mid-19th century: that of Gamlyn Isaf owned by a Thomas Rees and leased to Watkin Watkins, and of Gelli-isaf owned by the Honourable Robert Henry Clive leased to Howell David Howell; the Tithe shows the area set to a mixture of pasture, and meadow. Whilst, no industrial activity is shown, this may be due to any workings having long ceased operations.

The area is shown on the 1st edition OS map (1886/1890) bisected by the route of Tappenden's Tramroad, (also known as the Gamlyn Tramroad in the area and now a tarmac track), to the south are remnants of patches/quarries, and to the northwest a large triangular area of finger tips. Two 2 tramming lines (depicted as paths) serve the tips, that to the east, adjacent to the Afon Cynon approaches from the workings to the south, while the other (NPRN 34809), at SN9832104734, approaches the tips from the west, via an overbridge (base of recently reduced abutments survive) across Tappenden's Tramroad, this appears to originate in the now largely destroyed workings further to the west. These tipping lines appear out of use by the survey of the 1st edition map. To the north of Tappenden's Tramroad is an Old Mine (site of) and, further to the east, a short Row of workers' cottages and gardens (the footings of which survive).

The larger landscape features of the area survive in an overgrown state (brambles, brush and woodland predominates). The main tips survive, as do small areas of quarrying, but in a heavily overgrown, largely inaccessible state; a short length of quarry face with waste at the base of the slope was found to survive in woodland to the west of Tappenden's Tramroad, no remains were noted at the site of the old mine (EA004.01) depicted on the 1st edition OS map.

Table 21. Subsidiary point and polyline features within EA004

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA004.01	Old Mine, Cwm Nant-yr-Hwch	SN9845204639	Mine
EA004.02	Tramroad embankment/bridge abutments, Cwm Nant-yr-Hwch	SN9832004748	Bridge abutments
EA004.03	Workers' Cottages, Cwm Nant-yr-Hwch	SN9853804634	Miners' Cottage

Table 22. NMR Register within EA004

Nprn	Name	NGR	Type
34809	GAMLYN COLLIERY TRAMROAD	SN98320474	BRIDGE

Hirwaun Common, East (see figures 11 and 12)

Extractive landscape: Mynydd Cefn-y-gyngon: EA005A (see figure 11)

EA005A Archaeological significance: A/B

An extensive extractive area named as 'Coal & Mine Works' on 1st edition OS 1" map c. 1840 (David & Charles Edn), dominated by the remains of the Craig Colliery & Brickworks, is characterised by drift/level workings and quarries, and numerous airshafts set along the north-facing slopes of Mynydd Cefn-y-gyngon (centred on SN9656403706). The area, which is located south and upslope of an area of reclaimed and opencasted workings (ie the site of the former Bryn-gwyn Colliery, New Drift, Slade's Patch, Bryn-gwyn Level and Patches). Quarries in the area also retain indications of primitive scouring/hushing activity. The Aberdare Tithe (1844) shows little detail for this extensive track of upland, it does, however, indicate that the area formed part of Dyffryn Dare holding of the estate belonging to the Honourable Robert Henry Clive, then leased to a John Rees.

The 1st edition OS names the drift and shows the brickwork and engine house buildings of the main area of Craig Colliery, as well as its incline (now removed by opencasting) and associated tramroad, railed, contouring the slope to the west to an Old Level (coal), and east to a further Level (coal) with a weighbridge, with a prominent tip to the north downslope. Above the main Drift is a header tank supplied by a leat originating from a level (coal) located upslope to the southwest. This level, again with a prominent tip downslope to the north is served by a separate incline (a quarry scoop is located to the west, and an old pit lies adjacent to the east of the incline), though connected to the Drift by a zig-zag path. A high level path (tramming route) connects this level to two levels (coal) to the west on Rhiw Ymenyn, and near the head of the zig-zag path to the east, this high level path extends further west to an area of quarried outcrop containing an Old Level. Further to the east, connected by a network of paths/former dramming routes are a series of quarries, including one main linear N-S aligned quarry, following the line of a stream/scour, and a number of minor quarry scoops (2 shown on 1st edition OS). At the eastern edge of the area located above the site of the now opencasted Bryn-gwyn Level are the more extensive remains of 2 quarries, again with evidence of scouring/hushing. Downslope of the associated spoil tips is the site of an Old Level (1st edition). The area also contains a variety of ventilation shafts and related features.

The area is open and features away from the northern boundary survive in fair to good condition. A number of features not indicated on the 1st edition OS, include a rectangular transide structure, at Craig Colliery east, and a large stone built structure, possibly an engine house, on Rhiw Ymenyn, were also recorded during fieldwork. The most significant features within the area are as follows:

EA005.03, archaeological significance: A?/B

Air shaft on Hirwaun Common depicted on 1st edition OS maps (1868), as a circular feature set within the northern bounds of an elliptical scoop cut into the hillside with an area of spoil downslope of the adjacent east-west aligned path (EA005.55) . The feature, now partially collapsed, is roughly as depicted on the 1st edition OS map, and measures c3m by 3m, with traces of revetting on the south side. Aerial Photographs depict a straight linear embanked feature extending southsoutheast for c.69m to another airshaft (EA005.18) further upslope.

EA005.18, archaeological significance: A?/B

A small square airshaft on Hirwaun Common depicted on 1st edition OS map (1868), and visible on aerial photographs. Aerial photographs also depict a straight linear embanked feature extending northnorthwest for c.69m downslope to another airshaft (EA005.03). This appears to be a particular type of airshaft arrangement, using the hill side to provide a ‘ventilation chimney’, seen elsewhere on Hirwaun Common. Whilst the lower part of the airshaft was visited during the current fieldwork, the upper part was not due to inaccessibility.

EA005.29, archaeological significance: A?/B

A north-south aligned incline on Hirwaun Common running up the slope to serve an Old Level (EA005.13) depicted on the 1st edition OS (1868). The 1st edition map indicates the feature is disused (no rails or brake engines shown) by 1868. The feature survives as a grassed-over linear embankment, approximately 150m in length. The upper surface of the steeply sided incline embankment is 6.5m wide (max).

EA005.39, archaeological significance: A?/B

A well-constructed rectangular building, L-shaped in plan, with the base of a possible ‘stack’ protruding south at its southwest angle. Not depicted on the 1st-3rd OS maps, the feature has been interpreted as a possible engine house or ventilation structure. Drystone construction (?), of coursed squared blocks and rubble, with 9 courses visible (the lower courses are masked by tumble). It is defined by walls (standing to a maximum of 1.05m) on the west and south sides, with tumble in the interior and extending from the north side to the east, forming an L-shape. The long surviving west sidewall is 7.3m in length, with an additional 1.55m of tumble on the south side. The surviving wall on the south side is 2.45m. 3.8m to the west of the building is a circular area of tumble 1.5m in diameter. The sunken interior suggests that there may have been a shaft inside the building, alternatively, this may have been an engine house or other structure with a stack on the south side, which may account for the quantity of rubble tumble in this area. There is a spoil tip to the west with an Fe rail protruding from it, 0.12m wide and with an exposed length of 0.4m, while a pathway, which has been scarped into the slope, runs downhill from the building to the east.

EA005.32, archaeological significance: B

The prominent and impressive incline or tramroad leading WNW-ESE upslope to an old level and linear quarry just below the ridge of Mynydd Cefn-gyngon. This incline/tramroad is first shown and named as an ‘Old Tramway’ on the 3rd edition OS map, shown extending from the head of the now destroyed incline at Bryn Gwyn Colliery (at the time disused) to the area of two old levels (including EA005.05). The feature does not appear on earlier editions. The formation or trackbed is c.2.6m wide, scarped into the north-facing slope, extends, and has intermittent ditches on both sides. There are traces of stone revetting and metalling including occasional flat ‘pad-like stones’ visible on the surface of the incline. The feature is well vegetated with grass, reeds and bilberries.

EA005.54, archaeological significance: B

A sunken zig-zag track depicted on the 1st edition OS map (1877) from an airshaft at SN9579003867 to Pont Llestwen and Cwm Rhondda to the south, via a coal level (EA005.17) and Rhiw Ymenyn. The earlier OS Surveyors' drawing of 1814 and the 1st edition OS 1" to the mile (David and Charles c.1838) map both show the track continuing, beyond the area of the airshaft, north to Hirwaun. Feature survives in good condition for its class.

EA005.04, archaeological significance: B/C

A coal level, part of the Craig Colliery and Brickworks complex on Hirwaun Common depicted on 1st edition OS maps (1868). The level portal has now collapsed, but the entrance cutting, 1.1m wide, survives with revetting visible to either side. The floor of the entrance cutting is flooded, and a large chunk of tarmac sits at the mouth of the cutting.

EA005.08, archaeological significance: B/C

Drift mine, part of the Craig Colliery and Brickworks complex on Hirwaun Common depicted on 1st edition OS maps (1877). No sign of the portal survives, presumably collapsed, a curved embayment marks the site of the drift, and poor drainage remains a feature of the area indicating the site of the former drift entrance. There is a linear depression, slightly scarped into the hillside, running south and east of the adjacent complex of colliery buildings, which matches the route of minor tramroad features depicted on the 1st edition OS map. Tramroad access to the drift appears to have curved east of and beneath an overbridge to the rear of the complex of colliery structures.

EA005.12, archaeological significance: B/C

Coal level depicted on 1st edition OS map (1877), portal appears to face north, and no associated tramroad is shown. The level has now partially collapsed, but survives as a substantial deep cutting, revetted on either side, with 4-5 courses of stones visible, and with traces of vaulting visible to the portal entrance. The entrance cutting, average c1.3m wide, maximum 2m wide, and c6-7m long, contains a lot of tumble and splays out as it approaches the tramroad to the north.

EA005.27, archaeological significance: B/C

The internal tramroad system, associated with Craig Colliery & Brickworks, Hirwaun Common, which is shown on the 1st edition OS maps (1868/1877) linking the level (coal) at the eastern edge of the complex with the core area of the colliery site (the drift and incline head EA005.32) to the west. The fieldwork identified west-east aligned tramroad, partly sunken in a slight cutting, c0.6m deep and c1.5m wide, at the site of Craig Colliery drift. To the east, the course of the tramroad cutting (now an active stream) has been remodelled to curve to the northeast, possibly to allow drainage. Beyond an area lost to opencast damage the original tramroad formation survives to reappear at its eastern extent as an embanked formation as it approaches spoil tip EA005.24.

EA005.35, archaeological significance: B/C

Well-constructed stone revetting along the head of the incline EA005.32 where it's line levels out and is cut into the steep slope as it approaches the site of level entrance EA005.05. A small continuation to the east of the collapsed level entrance represents the eastern wing wall to the level portal. The walling is slightly battered and constructed of mixed random and roughly coursed masonry (platy stone blocks) appears to be drystone (though lime and earth mortar may have eroded). On the west side it extends for c31m, and stands to a maximum height of 1.85m (approximately 16 courses). There are occasional square-headed metal bolts protruding from the stonework. East of the level site is a short length of walling (the wing wall), 1.4m in length, 0.8m high (6 courses max), constructed of larger blocks, and is slightly curved, with some traces of lime mortar. To either side of the level entrance the upper courses of stonework have possibly been lost.

EA005.43, archaeological significance: B/C

A substantial quarry scoop on the slopes of Mynydd Cefn-y-gyngon, Hirwaun Common with exposed rock face at the head of the cutting and a single scouring leat at its head. A stubby tip lies downslope, and the scouring gully also continues downslope, into the opencast area. The whole complex of features is depicted on the 1st edition OS map, and there is a stone-filled shaft, c1.5m by 2m, at the base of the scoop. A small rectangular platform, c1.2m by 3m, possibly a tank, lies above the scoop to the east. This feature is approached by a path contouring the hillside and also by a path which runs upslope, curving, and embanked on the downslope side, the bank measures c0.5m wide and c0.2m high, and the trackway is generally c2m in width, though this varies along its length. Numerous further paths spread out to the east of the quarry workings, and there is a further single trial digging c50m to the east of this complex. It is generally well-vegetated and in good condition, other than sheep licks and some soil creep on the slope.

EA005.44, archaeological significance: B/C

A large quarry depicted on the 1st edition OS map (1868) south of Bryn-gwyn Level adjacent and east of a linear north-south scour/gully near the east boundary of area EA005A. The 1st edition OS gives a quarry face c.63m in length (east-west), whilst modern aerial photographs show an exposed east-west aligned quarry face of c.69m in length. Evidence of scouring is visible at the quarry face, while the associated tips are downslope to the north. This quarry, though not labelled on the historic mapping, is considered to be for ironstone extraction. At the quarry face, square blocks have been cut or have dropped from the stone, leaving square voids in the rock face. Two small scoops have been cut into the slope on the floor of the quarry, on either side of the central waste tip. A barrow run which runs in front of the quarry face has drystone revetting c1m high, of 5 rough courses of large blocks, on its downslope side. There is evidence of water management; an embanked gully c1m wide at the west edge of the quarry, appears to have diverted water away from the face of the quarry. This diverted water would have issued from scoured workings above (to the south), whilst the water would have also been used to scour further workings downslope (in the now opencasted area). The quarry is on the margins of an opencast; the associated tips have been truncated on their northern side and associated features located downslope to the north, such as the former incline, have been removed. What does survive, however, is in good condition.

EA005.46, archaeological significance: B/C

This large quarry scoop located south of Bryn-gwyn Level has a length of exposed rock face at its head, with tumbled stone blocks which have collapsed down from the face, with a small, steep-sided spoil tip to the east. The quarry face is shown to have been c.18m east-west on the 1st edition OS map (1868), but has been extended to the east by c.11.40m on aerial photographs. Spoil further downslope to the north have been destroyed by a landslide and opencast operations. There is a barrow run above the eastern spoil tip, which curves around the eastern side of the site to join with path EA005.55. At the quarry face small platforms have been terraced into the slope, probably workings platforms to allow the face to be worked back into the hillside.

EA005.49, archaeological significance: B/C

Probably the remains of a worker's shelter, this structure, c3-4m east-west and 2.6m north-south, is now defined by the remains of spread tumbled stone walls. Facing stones are visible, and the walls appear to have been random rubble. They survive to two courses, maximum c0.4m in height. The entrance appears to have been on the downslope side to the north; there is a lot of tumble in this part of the structure. There are fragments of pantile and poorly-made brick in the interior.

EA005.57, archaeological significance: B/C

A linear north-south aligned scour (c.250m in length within the EA005 area) with quarry scoop depicted on 1st edition OS map (1868) on Mynydd Cefn-y-Gyngon, Hirwaun Common; possibly on the line of a natural stream (north flowing) gully, the quarry face appears to have been enhanced by scouring activity to create a bowl shaped scoop c. 30m north-south with a quarry face c. 42m east-west, at the south. An associated track EA005.55, revetted on either side, crosses the entrance to the scoop, while an associated tip (c.17m. north-south), short and steep, lies east of the stream on the north side of the track. Other minor workings are located in the vicinity and other faces/exposures in the gully to the south and north of the quarry scoop are depicted on the 1st edition OS map. Evidence for the use of natural stream gullies is known in relation to early mineral prospection, and suggests an early date for this feature.

EA005.09, archaeological significance: B-D

Craig Colliery and Brickworks depicted on 1st edition OS map (1877), a complex of buildings and detached structures served by a tramroad, which runs east-west along the slope through the site. To the rear of the southern buildings, cut into the slope is the site of the Craig Colliery Drift mine, connected to the main tramroad by a branch line. A second, higher tramroad branch originally approached the rear of the building located in front of the drift from the south.

A series of low banks, platforms, hollows and channels indicate the cleared sites of the original colliery buildings and other features; the most impressive structural remains to survive in the area are two masonry structures, engine mounts, with holding bolts, located at the southeast and southwest.

The southwestern of the masonry structures (EA005.09a) comprises a well-built E-W aligned lime bonded masonry revetment wall, c.3.6m in length by c.0.26m wide, with a substantial N-S aligned embanked grassed-over feature to the S (possibly concealing an arched flue). An opening approximately a third of the way along the revetment leads into a stone lined channel, 1.15m long, set on a N projecting plinth. The stonework from the end of the channel to the back of the south wall is 1.7m in length. An extensive rubble spread extends below the structure. The walls are associated with 5 large upright Fe tie rods, with a further two downslope to the east. The rods are square-sectioned lower down with rounded screw-head tops.

The engine mount structure is 5.58m E-W overall (from the easternmost metal tie rod to the stone-faced bank on the west side), and 10.2m N-S (from the base of the rubble mound to the south of the revetment, the stonework survives c.8.5m from the foot of the mound). The N-S aligned 'plinth' with the central channel is 1.75m east-west. The easternmost of the tie rods of the structure lies approximately 1.85m east of the eastern end of the main E-W revetment wall. From this eastern tie rod a row of 3 further tie rods extends west (intervals of 1.11m, 1.39m and 0.85m). A sub-rectangular grouping of 5 tie rods at the west (includes the last two rods noted) extends north on the N projecting channelled plinth, with 2 tie rods c. 1.35m to the north of the latter 2, and a further single tie rod, slightly offset, 1.4m to the north again. The layout of the structure is complex and would benefit from a survey

There is a similar, though larger complex to the east (EA005.09b), located directly in front of the entrance to the drift mine. Again, this consists of a series of low banks, channels and depressions, with a prominent N-S embanked feature/mound, with a rubble spread on the north side. This mound sits in front of the tramroad which originally provided access to the former drift mine,

and the remains of a wall are visible on its west side, with the facing stones (the outer wall of an internal flue?) protruding from the sloping side. This forms one side of a series of small sub-rectangular enclosures defined by stone and earth banks, most of which retain facing stones (from west to east the banks are as follows: 1.6m wide, 1.5m wide, and 1.6m in width). A number of large upright Fe tie rods lie to either side of the N-S bank between the western two enclosures, and extend around the north end of the large mound. Again this forms a complex arrangement, which would benefit from survey: from the west end of the complex, the first row of tie rods is at 6m, the second at 6.6m, the third at 7.1m, then at 8.75m and 9.3m. There is then a gap until the second cluster of tie rods at the north side of the prominent embanked feature, with a row at 11.7m, at 12.9m, 13.65m, and the easternmost row at 14.45m (all measured from the west end of the feature).

On the slopes above the southwestern of the engine/machinery mounts extending towards the drift mine are a series of stone and earth banks, a large, slightly embanked sub-circular hollow, 7.9m external diam. and 4.4m internal diam. (possibly a stone-lined shaft?) with a platform to the east.

Table 23. Subsidiary point and polyline features within EA005A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA005.01	Tips, Hirwaun Common	SN9593703684	Tip
EA005.02	Old Level, S of Bryn-gwyn Level, Hirwaun Common	SN9721203967	Level
EA005.03	Air Shaft, Hirwaun Common	SN9669503814	Ventilation Shaft
EA005.04	Coal level, Hirwaun Common	SN9664203850	Level
EA005.05	Old Level, Hirwaun Common	SN9654103752	Level
EA005.06	Header tank? Hirwaun Common	SN9621403841	Reservoir?
EA005.07	Air Shaft, Hirwaun Common	SN9620703865	Ventilation Shaft
EA005.08	Drift Mine, Hirwaun Common	SN9623703875	Drift Mine
EA005.09	Craig Colliery and Brick Works, Hirwaun Common	SN9622103914	Colliery; Brickworks
EA005.10	Old Coal Level, Hirwaun Common	SN9613803892	Level
EA005.11	Air Shaft, Hirwaun Common	SN9611203934	Ventilation Shaft
EA005.12	Coal Level, Hirwaun Common	SN9621403755	Level
EA005.13	Coal Level, Hirwaun Common	SN9605203742	Level
EA005.14	Air Shaft, Hirwaun Common	SN9604703735	Ventilation Shaft
EA005.15	Air Shaft, Hirwaun Common	SN9578703864	Ventilation Shaft
EA005.16	Air Shaft, Hirwaun Common	SN9586903668	Ventilation Shaft
EA005.17	Coal Level, Hirwaun Common	SN9589703667	Level
EA005.18	Air Shaft, Hirwaun Common	SN9671003735	Ventilation Shaft

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA005.19	Pit, Hirwaun Common	SN9612403864	Extractive pit
EA005.20	Trackside feature at level, Hirwaun Common	SN9663003865	Structure
EA005.21	Weighbridge, Hirwaun Common	SN9662803873	Weighbridge
EA005.22	Trial working, Hirwaun Common	SN9629904001	Trial mine
EA005.23	Adit, Hirwaun Common	SN9679103829	Adit
EA005.24	Tips, Hirwaun Common	SN9662903887	Tip
EA005.25	Linear depression, Hirwaun Common	SN9622904019	Leat
EA005.26	Bank feature to north of Craig Colliery, Hirwaun Common	SN9620503915	Bank (earthwork)
EA005.27	Internal Tramroad System, Craig Colliery & Brickworks, Hirwaun Common	SN9661903876	Tramroad
EA005.28	Air Shaft, Hirwaun Common	SN9626803875	Ventilation Shaft
EA005.29	Incline, Hirwaun Common	SN9611303839	Inclined Plane
EA005.30	Leat, Craig Colliery & Brick Works, Hirwaun Common	SN9612803800	Leat
EA005.31	Leat, Craig Colliery & Brick Works, Hirwaun Common	SN9609503849	Leat
EA005.32	Incline, Hirwaun Common	SN9649903755	Inclined Plane
EA005.33	Quarry, Mynydd Cefn-y-Gyngon, Hirwaun Common	SN9645603718	Quarry
EA005.34	Trial workings, Hirwaun Common	SN9639903790	Trial Mine
EA005.35	Stone revetting, Hirwaun Common	SN9649803763	Revetment
EA005.36	Trial workings, Hirwaun Common	SN9630403757	Trial Mine
EA005.37	Shelter, Hirwaun Common	SN9609603741	Structure
EA005.38	Drystone footings, Hirwaun Common	SN9601103697	Structure
EA005.39	Possible Engine House, Hirwaun Common	SN9601703677	Structure
EA005.40	Small quarry scoop, Hirwaun Common	SN9605603885	Quarry
EA005.41	Sunken trackway, Hirwaun Common	SN9624003799	Trackway
EA005.42	Quarry scoop	SN9705203840	Quarry
EA005.43	Large quarry scoop and leat, Hirwaun Common	SN9710603822	Quarry
EA005.44	Quarry, S of Bryn-gwyn Level, Hirwaun Common	SN9713803889	Quarry
EA005.45	Trackway, Hirwaun Common	SN9698503890	Trackway
EA005.46	Quarry scoop, S of Bryn-gwyn Level, Hirwaun Common	SN9721803891	Quarry
EA005.47	Rectangular depression, Hirwaun Common	SN9679003906	Structure
EA005.48	Wheel emplacement, head of incline Hirwaun Common	SN9611303756	Wheel emplacement
EA005.49	Structure, Hirwaun Common	SN9661103866	Structure
EA005.50	Incline (site of), Craig Colliery & Brick Works, Hirwaun Common	SN9630004453	Incline
EA005.51	Leat, W of Craig Colliery & Brick Works, Hirwaun Common	SN9607603939	Leat
EA005.52	Leat, W and N of Craig Colliery & Brick Works,	SN9619004122	Leat

Feature Number (see gazetteer for further details)	Name	NGR	Type
	Hirwaun Common		
EA005.53	Path/Dram Route, Mynydd Cefn-y-Gyngon, Hirwaun Common	SN9609703754	Path
EA005.54	Sunken Trackway over Rhiw Ymenyn, Hirwaun Common	SN9586503693	Trackway
EA005.55	Path/Dram Route, Mynydd Cefn-y-Gyngon, Hirwaun Common	SN9704203842	Path
EA005.56	Track to Cefn-y-Gyngon, Hirwaun Common	SN9720103837	Track
EA005.57	Linear Scour and Quarry Scoop, Mynydd Cefn-y- Gyngon, Hirwaun Common	SN9694203802	Quarry
EA005.58	Trackway extension, Hirwaun Common	SN9688303933	Track
EA005.59	Trackway extension, Hirwaun Common	SN9689003937	Track
EA005.60	Tip, Hirwaun Common	SN9605403775	Tip

Extractive landscape: area west of Waungron: EA005B (see figure 12)

EA005B Archaeological significance: C

A small area of surviving extractive landscape located to the west of Waungron at SN9581004904, also characterised chiefly by tramroad features, associated with workings further to the south. Two small extractive features survive in the area; Drift Mine, Hirwaun Common (EA005.61) and Horseway Level (EA005.62). The tramroad features appear to survive in reasonable condition for their type. All features were observed to survive on the latest aerial photographs, though only feature EA005.65, Aberdare Rhondda Railway, Hirwaun Common, was visited during the project due to problems with access, this is detailed as follows:

EA005.65, archaeological significance: B/D

Surviving sections of railway embankment/formation depicted on the 1st edition OS map (1877/1885), part of the line named the 'Aberdare Rhondda Railway' on the 1st edition map (later Tower Colliery Railway on 2nd edition OS map 1900/1904), extend through the area. The surviving eastern section, c.3.6m wide (width varies), comprises a slightly embanked/raised loop curving from west to north (between SN9564205033 and SN9578905139), and formerly extended beyond a junction with tramroad spur EA005.64 at SN9580605204 (now lost to road development) to join with the Hirwaun Common Railway. And a further surviving section to the west of SN9526905064 comprising two closely associated spur loops, shown railed on the 1st edition OS map. The loops are associated with trackside features EA027.03, EA07.04 and EA07.05 and set within a curvilinear area of tips. These tips and the route of the tramroad/railway formation survive within an area of recent plantation. The majority of the railway route between the surviving eastern and western formations is in use as a track.

Table 24. Subsidiary point and polyline features within EA005B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA005.61	Drift Mine, Hirwaun Common	SN9595304610	Drift Mine
EA005.62	Horse Way Level, Hirwaun Common	SN9593204871	Level
EA005.63	Circular mound, W of Horse Way Level, Hirwaun Common	SN9589204877	Mound
EA005.64	Tramroad spur off the Aberdare Rhondda Railway, Hirwaun Common	SN9583804871	Tramroad
EA005.65	Aberdare Rhondda Railway, Hirwaun Common	SN9558405038	Railway
EA005.66	Tramroad, Hirwaun Common	SN9579804974	Tramroad

Table 25. HER Registers within EA005B

Prn	Name	NGR	Type
03168m	256 CULVERT, ABERDARE-RHONDDA TRAMROAD	SN95820506	Culvert
03221.0m	275 TRAMWAY BRANCH-HIRWAUN COMMON RAILWAY	SN95970500	Tramway
03222m	273 TRAMROAD KNOBBY DRIFT	SN95660520	Tramway
03223.0m	255B TRAMROAD B - BRANCH OF THE ABERDARE & RHONDDA TRAMROAD	SN95810512	Tramway
03224m	255 RAILWAY A. ABERDARE & RHONDDA RAILWAY	SN95780514	Railway
03231.0m	255C TRAMROAD C	SN95870510	Tramway

Cwmbach Extractive Area (see figure 13)

The area comprises three small detached areas of workings: Tunnel Pit; Gnoll Quarry; and workings on Craig-y-Gilfach to the NE of Tunnel Pit.

Extractive landscape: Gnoll Quarry: EA006A (see figure 13)

EA006A Archaeological significance: U

The extractive area of Gnoll Quarry is located high on the steep south-west facing slopes of Tyle Robert above Cwmbach (at SO0286702329). No workings are shown in the area on the Aberdare Tithe map (1844), the workings are first shown on the 1st edition OS map of 1890. Gnoll Quarry comprises a slightly sinuous linear quarry face with tips downslope to the W. An incline is shown extending WSW to Cwmbach. The incline splits at the site of a small complex including an Old Sheave, Old Level (coal), adjacent reservoir and airshaft. Two small rectangular features, possibly shelters, are indicated; the one to the north is freestanding, whilst that at to the south is incorporated within a boundary. Two small linear quarry scoops and a small quarry lie further to the S, beyond the boundaries of the area.

At the time of the walk over survey vegetation growth (high bracken) severely hampered access to the area and it was not possible to record the quarry at Gnoll.

Table 26. Subsidiary point and polyline features within EA006A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA006.03	Rectangular feature, Gnoll Quarry	SO0305902457	Structure
EA006.04	Rectangular feature, Gnoll Quarry	SO0305502261	Structure
EA006.05	Incline, Gnoll Quarry	SN0285002320	Incline
EA006.06	Old Sheave, Gnoll Quarry	SN0271702234	Sheave
EA006.07	Old Level, SW of Gnoll Quarry	SN0272202222	Level
EA006.08	Reservoir, SW of Gnoll Quarry	SN0271902194	Reservoir
EA006.09	Airshaft, SW of Gnoll Quarry	SN0268702183	Airshaft
EA006.10	Linear Working, S of Gnoll Quarry	SN0305402198	Working
EA006.11	Linear Working, S of Gnoll Quarry	SN0308802141	Working
EA006.12	Quarry, S of Gnoll Quarry	SN0321502117	Quarry

Table 27. HER Registers within EA006A

Prn	Name	NGR	Type
03735m	Gnoll Quarry, Cwmbach	SO0307302360	Quarry

Extractive landscape: Graig-y-Gilfach: EA006B (see figure 13)**EA006B Archaeological significance: U**

The workings on Craig-y-Gilfach (at SO0306202899) located to the NE of Tunnel Pit include two quarries, the larger to the SW contains an old shaft, whilst that to the NE has a small rectangular building marked as a ruin (1st edition OS 1868) main axis aligned NW-SE across the front of the quarry with the tip to the SW. A further linear building, of 3-bays, main axis aligned SW-NE, lies to the NE, again marked as ruin (1st edition OS 1868). The features are first shown on the 1st edition OS maps of 1868 and 1890, the Aberdare Tithe map of 1844 shows the area as scrub woodland or furze.

At the time of the walk over survey vegetation growth (high bracken) severely hampered access to the area and it was not possible to access and record the features at Craig-y-Gilfach. The features at Craig-y-Gilfach now lie within an area of dense forestry plantation, confirmed by the latest aerial photographs.

Table 28. Subsidiary point and polyline features within EA006B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA006.01	Ruin, Cwmbach	SO0316503063	Building
EA006.02	Ruin, Cwmbach	SO0311103025	Building

Table 29. HER registers within EA006B

Prn	Name	NGR	Type
03729m	Old Quarry, Craig-y-Gilfach	SO0299802891	Quarry
03730m	Old Quarry, Craig-y-Gilfach	SO0310402924	Quarry
03965m	Old Level, Craig-y-Gilfach	SO0306802970	Level
03969m	Airshaft, Craig-y-Gilfach	SO0298002887	Ventilation Shaft
03731m	Quarry, Craig-y-Gilfach	SO0305403018	Quarry

Extractive landscape: Tunnel Pit: EA006C (see figure 13)**EA006C Archaeological significance: B/U**

An extractive area centred on the colliery site of Tunnel Pit, located west of Blaen-nant-y-groes at SO0255202662. The 1st edition OS map (1890) depicts and names Tunnel Pit (coal) located S of and adjacent to the GWR (Vale of Neath Section) at the entrance to the Tunnel to Waunwyllt, Merthyr Tydfil. Also depicted and named are a smithy and an adjacent airshaft both set on a low tip/platform, and a weighing machine (housed in a rectangular transide feature) on the colliery tramroad spur, W of the pit head. The map displays the pit head buildings (including coal tipping bays above the colliery tramroad), a cluster of three rectangular buildings to the N (including the smithy), and a header tank to the NE, fed by a leat which drew water from the Nant-y-groes to the E. A prominent tip aligned NNE-SSW, with a short W-E spur, lies to the S. Trammings lines are shown extending down the main tip from the pithead via an overbridge (now

removed) across the tramroad (1st edition OS). A small rectangular structure in an overgrown state on the tip adjacent to the tramming line (east side of tip) was also noted.

The remains at Tunnel Pit were accessible, however the remains of the pithead structures were largely overgrown, with the notable exception of the revetted wall of railside coal tipping bay/chutes and an integral bridge abutment to the tips which survived in particularly good condition. Much of the area surrounding the pithead, and the tips themselves, was obscured by impenetrable brush and scrub and dense bracken at the time of the survey. Evidence of on-going erosion to the tips from off-road vehicles was visible.

On the north side of the tramroad is a substantial, well-built length of masonry revetting, including a bridge abutment, described further below. Another feature recorded was a sub-circular depression, c3m by 2m, north above the revetting at SO 02567 02626 (9.6m accuracy), a pit or shaft, and a linear depression to the north of this. Adjacent to the southeast is a second depression its location suggesting a relationship to the coal shutes in the revetment. There is a smithy and other structures depicted on the 1st edition OS map further to the north, but this area is substantially overgrown. A further sub-circular depression, c2.5m by 3m, set slightly apart to the northwest is thought to be an air shaft shown on the 1st edition OS map.

The main surviving feature at Tunnel Pit is the impressive masonry revetted coal chute and abutment detailed as follows:

EA006.18, archaeological significance: B

A substantial, well-built length of masonry revetted embankment located at Tunnel Pit. The feature, with an integral bridge abutment allowing access to the tips to the south, acted as a coal tipping stage; the whole structure is depicted on the 1st edition OS map (1890). The feature is c3.5-4m in height and survives to between 34-35 courses, c. 56m in length E-W, with a bridge abutment, c. 2m in width, at SN0256302618. This was the north abutment associated with the now removed high level tramroad overbridge which provided access to the main tipping area over the rail spur which connected to the GWR (Vale of Neath Section) as it approached the Tunnel at Blaenant-groes. A further abutment also survives on the S side of the GWR spur, though in poor condition. The revetting comprises roughly dressed, coursed, squared sandstone blocks, bonded with grey mortar. In places, the dressed facing stones have been robbed out, revealing the rubble core. Two pairs of large apertures, coal chutes, are set within the revetment wall, the pair to the east have brick reveals and stone lintels, the two to the west have stone lintels and stone reveals, and are probably older. The chutes are approximately the same size, though those to the east are less well-preserved as is the length of walling at the east, which appears to have been less well-built. To the west, the walling is better-preserved; the pointing in this area survives probably due to being protected from the elements by the overbridge, which was formerly located here. Metal spikes were noted to protrude from the stonework in the west end, just below the western chutes. Additionally a number of small apertures, or putlogs, in the stonework (for timbers during construction), were noted.

Table 30. Subsidiary point and polyline features within EA006C

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA006.13	Pit head, Tunnel Pit	SN0256802626	Pit
EA006.14	Smithy, Tunnel Pit	SN0257402642	Smithy
EA006.15	Header Pond, Tunnel Pit	SN0262002653	Reservoir
EA006.16	Rectangular feature, Tunnel Pit	SN0256002592	Structure
EA006.17	Internal tramroad, Tunnel Pit	SN0255302595	Tramroad
EA006.18	Revetted coal chute and abutment, Tunnel Pit	SN0256802616	Coal tipping stage
EA006.19	Weighing Machine, Tunnel Pit	SN0252202627	Weighing Machine
EA006.20	Airshaft, Tunnel Pit	SN0255802655	Airshaft
EA006.21	Leat, Tunnel Pit	SN0265902658	Leat
EA006.22	Rectangular stream-side structure, Tunnel Pit	SN0269802665	Structure

Lletty Shenkin Extractive Area (see figure 14)**Extractive landscape: Lletty Shenkin Quarry: EA008****EA008 Archaeological significance: B/U**

The Quarry at Lletty Shenkin lies to the SE of Lletty Shenkin House within an area of common land (at SO0336201316). The quarry is not shown on the mid-19th century Tithe map; at this date the area, known as ‘Graig fach’, formed part of the Lletty Shenkin holding, then owned by an Edward Morgan. The 1st edition OS map depicts the main quarry with a less well-developed linear face (earlier) to the N and a smaller detached quarry to the S. The main quarry is served by an incline, which extends WSW to Lletty Shenkin Colliery (Upper and Lower), its route preserved as a linear cutting in an area of dense bracken. The 1st edition OS details the incline head (brake engine house etc) within the area and a level at the NW edge of the quarry. The smaller quarry to the S, with tramming lines depicted serving the quarry face (and tips to the W) is connected to the incline head by tramroad. The tramroad continues as far as Pengraig and a further quarry to the SE (beyond the boundary of the area). NW of the main quarry are the ruinous remains of Lletty Shenkin: 6 unit linear structure, main axis aligned NW-SE with associated yards and detached outbuilding to the N. The remains of a smallholding possibly converted to a short Row of quarry workers’ cottages.

The interior of the main quarry and that to the S, and the site of the Level were obscured by dense vegetation (bramble, brush and bracken) at the time of the visit. The main quarry towards the north of the area consists of a linear quarry face, forming a sheer rock face c6m high, on the east side of the track, with small piles of waste stone at its base. A small quarry scoop embayment lies to the south of this main face, (at SO0333701279 (13.4m accuracy) though this is now overgrown with woodland, mainly young silver birch. A cutting enters this embayment from the south, running east-west, laterally from the main access track for the area. There are two small tips in front of this, lying downslope to the west, on the opposite side of the main track. Further down the slope, below these two tips, a revetted stone track runs in front of them through the area of woodland, shown on the 1st edition OS map (1868). Further to the south of the embayment, the southernmost quarry of this area, interior overgrown, is set back from the track, and has two entrances cut into the slope to allow access to the tramroad, with a large tip at the southern entrance and a small tip opposite that to the north.

Table 31. Subsidiary point and polyline features within EA008

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA008.01	Level, Lletty Shenkin	SO0329101396	Level
EA008.02	Lletty Shenkin Cottages	SO0325501406	Cottages
EA008.03	Tramroad, Lletty Shenkin	SO0332301302	Transport
EA008.04	Lletty Shenkin Incline, Lletty Shenkin Quarry	S00306001303	Inclined plane
EA008.05	Lletty Shenkin Quarry	SO0333201377	Quarry
EA008.06	Quarry, S of main Lletty Shenkin Quarry	SO0341401218	Quarry
EA008.07	Site of winding drum/brake engine, Lletty Shenkin Quarry	SO0330301382	Brake engine

Gadlys Extractive Area (see figures 15 -17)

Extractive landscape: Merthyrdare Colliery: EA010A (see figure 15)

EA010A Archaeological significance: A-D

The Merthyr Dare Colliery, part of EA010 Gadlys Extractive Area, lay to the E of Penrhiwllech on the S flank of Cwm Dare (at SN 97978 02538). The 1st edition OS depicts and names the pits, engine house, 3 airshafts, and a Sheave. The engine house is one of a cluster of 3 buildings at the pithead. The main tip, of large size, located down slope to the N of the pit, has its head to the NW with then extant tramming lines shown. Tram access to a coal shipping point or tipping bay on the GWR (Dare Branch) to the N is provided from the pits via a linear cutting through the tips. A rectangular structure on the tip is shown E of the cutting. A Row of 6 colliers' cottages (main axis aligned N-S), with yards extending to the W, lies to the W of the pithead. A further Tramroad access to the GWR extends along the E boundary of the Colliery site to a Sheave located on a further tipping area (tramming lines in place) SW of the pit and a pithead reservoir. A track/minor road provides access to the colliery site from Cwm Dare and the Dare Inn via an under pass beneath the GWR runs along the W boundary of the area, and also provides access to minor level workings and a quarry within an area of open deciduous woodland at the SW of corner of the area. The quarry, a semi-circular scoop with spoil tip to the N, is approached via a cobbled spur road running SE off the latter track. The 1st edition Os depicts a rectangular structure within a sub-rectangular enclosure immediately E of the quarry; this was found to be a platform house.

Merthyr Dare Colliery was sunk prior to 1851. It closed in 1884; most of the buildings had been demolished by 1900, according to the Ordnance Survey 25in map. Around 1906, it seems the mine was resuscitated and a new winder house (nprn 33715) built – the OS map shows the colliery in operation by 1919. T-shaped in plan, the house had king-strut roof trusses and semi-circular headed cast-iron window frames. By 1948 the mine was again shown as disused on the OS mapping; the whole site was demolished and landscaped in the early 1970s, forming part of the Dare Valley Country Park. (NMR; NMR site file Glamorgan/Industrial/SN90SE: Council for British Archaeology Industrial Archaeology Report Card of 15 July 1965; Coflein).

The field visit confirmed the Dare Colliery site to had been largely reclaimed, dense scrub now masks much of the area of the former colliery site. Little now survives other than some peripheral features located SW of the main colliery site; the best preserved of these are detailed below. The large tip which lies to the south relates to coal workings, and is of later date, not depicted on the 1st edition OS map. The most significant of the surviving sites, including RCAHMW entries, are detailed below, where available descriptions of NMR sites augmented during the course of the current survey are given in italics:

EA010.10, archaeological significance: A?/B

A rectangular feature enclosed within a rectangular enclosure depicted on 1st edition OS map (1868), located in close association with a quarry and associated tip at Pen-rhiw-llech, W of Merthyrdare Colliery. The field visit identified the feature as a house platform; walling, c0.5m wide and surviving to a maximum of 9 courses, the lateral walls of a building or house was noted to extending east of the track. Of well-constructed of random rubble, with possible indications of lime mortar or lime wash. Where the south wall approaches the track on the upslope side, it curves and forms the revetted downside of the track. The location of the north wall of the

structure is indicated by a linear jumble of moss-covered stones. The structure was found to sit on a level platform, with some indications of revetting, now well-tumbled. The interior of the feature is obscured by tumble and dense vegetation, including small trees. On the far side of the track was a further length of surviving revetting, 6.1m in length, c0.7m high, comprising at least 8 courses of random rubble.

EA010.19, archaeological significance: B/C

A small quarry scoop, cut into the northeast facing hillslope at Pen-rhiw-llech, W of Merthyrdare Colliery, set on the northwest side of a revetted access track (EA010.26). An associated tip lies downslope to the northeast, on the opposite side of the track. The bowl-shaped quarry is c15m in diam. The interior is grass-covered and quarry faces lichen-covered, indicating the feature is undisturbed and well-preserved. Low wall footings cut across the entrance to the quarry, and drystone revetting was noted to either side of the quarry entrance on a similar alignment.

EA010.26, archaeological significance: B/C

Track to a small quarry at Pen-rhiw-llech, depicted on 1st edition OS map (1868), leading southeast from main mountain track/road (EA010.18) at SN9778802437 to small quarry (EA010.10) and platform house (EA010.19). Originally extended as far as c.SN9783902347 (a modern track continues to the west). Feature is intact and in use as footpath. The feature is slightly scarped into slope, and set on a revetted embankment (obscured by bracken), with a well-built metalled stone surface.

Table 32. Subsidiary point and polyline features within EA010A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA010.01	Trackside Feature, Merthyrdare Colliery	SN9818502684	Structure
EA010.02	Trackside Feature, Merthyrdare Colliery	SN9817702676	Structure
EA010.03	Air Shaft, Merthyrdare Colliery	SN9818002613	Ventilation Shaft
EA010.04	Building? Merthyrdare Colliery	SN9819102614	Building?
EA010.05	Pits, Merthyrdare Colliery	SN9817402594	Pits
EA010.06	Pit? Merthyrdare Colliery	SN9815802598	Pit?
EA010.07	Colliery Building, Merthyrdare Colliery	SN9813802600	Building
EA010.08	Reservoir, Merthyrdare Colliery	SN9812002525	Reservoir
EA010.09	Rectangular Feature, Merthyrdare Colliery	SN9806402476	Structure
EA010.10	Platform House, Pen-rhiw-llech, W of Merthyrdare Colliery	SN9783202364	Platform house
EA010.11	Air Shaft, Merthyrdare Colliery	SN9797102401	Ventilation Shaft
EA010.12	Air Shaft, Merthyrdare Colliery	SN9800902445	Ventilation Shaft
EA010.13	Level, Merthyrdare Colliery	SN9788102429	Level
EA010.14	Level, Merthyrdare Colliery	SN9788802434	Level
EA010.18	Metalled trackway, Merthyrdare Colliery	SN9788802429	Trackway
EA010.19	Small quarry and tip, Pen-rhiw-llech, W of Merthyrdare Colliery	SN9780702362	Quarry

EA010.26	Track to Quarry, Pen-rhiw-Ilech, W of Merthyrdare Colliery	SN9782002373	Track
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Table 33. NMR Registers within EA010A

Nprn	Name	NGR	Type
33715	ENGINE HOUSE, MERTHYR DARE COLLIERY	SN981026	ENGINE HOUSE
85004	MERTHYR DARE COLLIERY	SN98120259	COAL MINE

Extractive landscape: Craig Colliery and Craig Rhiw-ddu Quarry: EA010B (see figure 16)**EA010B Archaeological significance: U**

The Craig Colliery and Craig Rhiw-ddu Quarry, part of EA010 Gadlys Extractive Area, is located SW of Aberdare, on the N facing slopes of Cefn Rhos Gwawr (at SN9944002177). The Aberdare Tithe map (1844) indicates the site of Craig Colliery formed part of the Bute Estate land holdings leased to the Gadlys Iron Company, whilst the site taken by Craig Rhiw-ddu Quarry formed part of Llwyn Helig owned by the Honourable Robert Henry Clive, by the mid-19th century. The Craig Colliery site is first detailed on the 1st edition OS; the pithead has a cluster of three groups of conjoined structures, 3 limekilns, a Sheave and header tank to the S with disused incline, aligned N-S, to W of the Sheave and to the S of the Sheave a large tip (unrailed), aligned SW-NE. N of the pithead are two large lobed tips; the one to the W disused (though route of tramming line aligned SE-NW indicated), the one to the E shown with extensive area of parallel tram lines (the stack yard). Along the W side of the latter tip is a tipping line with tipping spurs, in association with a small rectangular structure. An incline (aligned SSW-NNE) provides access from the pithead area between the 2 tips and through an underpass beneath the GWR (Aman Branch) to the Gadlys ironworks via branches to the Dare Pit, and Gadlys Old and New Pits.

Upslope to the S of the area is Craig Rhiw-ddu Quarry; a N-facing linear quarry face described as old on the 1st edition, with an incline, extending from an 'old drum' at its head, aligned WSW-ENE, to a further 'old drum', where it takes a SW-NE alignment, leading to Craig Colliery.

The main large-scale features at Craig Colliery and Craig Rhiw-ddu Quarry survive, though the pithead structures appear to have been removed, and the shafts capped. Vegetation (bracken, bramble and brush) was a major problem at the time of the visit: preventing both access and limiting visibility; for this reason it was not possible to gain access to the quarry and much of the colliery site. The most significant surviving feature noted at the time of the visit was the lower section of the Craig Rhiw Ddu Quarry incline, detailed below:

EA010.20, archaeological significance: B/U

A tramroad and incline system at Craig Rhiw Ddu Quarry depicted as a track (ie rails lifted) on the 1st edition OS map (1868), extent on 1st edition OS shown; tramroad extends west-east along quarry face of Craig Rhiw Ddu Quarry from SN9879401592 to an 'Old Drum' (EA010.27), and the head of an upper incline, aligned southwest-northeast, at the base of which was a further 'Old Drum' (EA010.15), at the head of a lower incline, which continued southsouthwest-northnortheast to Craig Colliery at SN9947802096. The base of the incline is shown tipped over

by tips extending west of the colliery site. Progressive tipping appears to have covered the base of the feature, so that by 1900 the lower incline was visible only as far north as SN9944302021, little change is noted by 1920, by which time the colliery is disused (2nd and 3rd edition OS maps). The upper tramroad and incline are now obscured by dense bracken, whilst the lower incline, largely intact, is grassed over with a leat near its northern end adjacent to the east (IWW934). The embankment survives to a height of c1.5m and is c3m wide as it approaches the colliery site. Mature trees grow from the sides of the embankment.

Nprn 34812, archaeological significance: B/U

Graig-Rhiw-Ddu Incline: “Disused incline from quarry to ?iron works at Graig. No trace of sleepers or rails, no visible winding houses” (RCAHMW; NMR; Coflein). *Upper part of incline inaccessible because of dense vegetation at time of current survey. See EA010.20.*

Table 34. Subsidiary point and polyline features within EA010B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA010.15	Old Drum, Lower Incline, Craig Rhiw Ddu Quarry	SN9931301724	Winding Drum
EA010.16	Air Shaft, Craig Colliery	SN9953402296	Ventilation Shaft
EA010.17	Incline, Craig Colliery	SN9947901968	Inclined Plane
EA010.20	Incline & tramroad system, Craig Rhiw Ddu Quarry	SN9899101590	Inclined Plane/Tramroad
EA010.21	Pond, Craig Colliery	SN9949602019	Pond
EA010.27	Old Drum, Upper Incline, Craig Rhiw Ddu Quarry	SN9910001594	Winding Drum
EA010.28	Craig Rhiw Ddu Quarry	SN9901001574	Quarry
EA010.29	Sheave, Craig Colliery	SN9950802007	Sheave
EA010.30	Incline & tramroad system, Craig Colliery	SN9952102176	Tramroad/Inclined Plane
EA010.31	Reservoir, Graig Colliery	SN9947102030	Reservoir
EA010.32	Linear tip, Craig Colliery	SN9953701972	Tip
EA010.33	Rectangular feature, Craig Colliery	SN9956302190	Structure
EA010.34	Tip, Craig Colliery	SN9947502230	Tip
EA010.35	Tip, Craig Colliery	SN9956502173	Tip

Table 35. NMR Registers within EA010B

Nprn	Name	NGR	Type
34812	GRAIG-RHIW-DDU INCLINE	SN991016	INCLINED PLANE
80623	GRAIG COLLIERY	SN99520209	COAL MINE

Extractive landscape: Level Fach: EA010C (see figure 17)

EA010C Archaeological significance: A/B

Level Fach, again part of EA010 Gadlys Extractive Area, is located north of Blaengwawr on the lower slopes of Rhos Gwawr (at SO0034001955), W of the former Blaengwawr Colliery site. The portal entrance to Level Fach (coal) is depicted on the 1st edition OS map (1868) midway along the SW border of the area, with a tram road exiting NE along a short the level cutting, to then turn 90 degrees SE along a causeway (revetted along its SW side) to join the main incline system running NE from Blaengwawr Quarry to Blaengwawr Colliery. The line of the main incline is staggered at Level Fach, with the lower part of the incline set slightly to the S, and an engine (small header tank shown) located at the angle made by the junction (1st edition OS). A line runs NNW to a trackside feature (loading bay) on the GWR (Aman Branch). Opposite the level portal, just E of the turn is a small complex, probably an engine. Upslope and W of the level entrance is a rectangular header tank fed by a leat coming from the NW. The associated area of tips is bisected by the line of the GWR (Aman Branch); a short tramping spur runs off the main incline onto the E of the 2 tips (1st edition OS).

The area is partly under open deciduous woodland; the level portal, tips and tramroad causeway survive in good condition. The engine houses depicted on the 1st edition may survive in a buried condition. Access to the incline system, and the lower area of tips was impeded by vegetation, though indications are for some level of survival. The most significant surviving features within the area are as follows:

EA010.24, archaeological significance: A/B

Level Fach, a coal level depicted on the 1st edition OS map (1868) and named as Level Fach, though by the 2nd edition (1900), renamed Blaengwawr Level, and disused by the 3rd edition (1920). The remains of the partially buried level entrance survive at the southwest end of a linear cutting. The level portal, c1m wide, exposed to a depth of c0.6m, (c.4 courses) has a well-constructed segmental headed masonry arch. The opening has been deliberately blocked and overflow from the nearby header tank EA010.23 has silted up the cutting to just below the segmental arch. The level was served by an incline (EA010.25) which approached the area from the northeast, via a stone revetted embankment.

EA010.25, archaeological significance: A/U

The Blaengwawr & Level Fach combined incline & tramroad system, an incline and tramroad system connecting Blaengwawr Quarries at c. SN9973801452 with a tramroad connection at SO0029201866 to Level Fach and (via another incline and over bridge) to Blaengwawr Colliery (at approx. SO0054901999) depicted on the 1st edition OS map (1868). The inclines had two associated drum houses at the head of the upper and lower Blaengwawr inclines (dual inclines) and an engine house/brake engine at the head of the incline (dual incline) below Level Fach. The lower incline crossed the GWR (Aman) branch via an overbridge (now removed) on route to Blaengwawr Colliery. Extending to the southwest and northeast of the southeast edge of Area EA010C, the incline system is extensive and appears to survive relatively intact (now with the appearance of a wooded field boundary), though it has been considerably altered and truncated to the east as it approaches the site of the former Blaengwawr Level. The Blaengwawr inclines were disused by 1900 (2nd edition OS map), whilst the incline below Level Fach continued in use and is shown altered to serve the later Blaengwawr Level further to the east by 1920 (3rd edition OS map). Within Area EA010C an embanked tramroad served Level Fach (EA010.24); this feature extended northeast of the level portal within a narrow cutting (now a stream), and

just southwest of a cluster of rectangular structures (an engine house), turned 90 degrees to the southeast along the top of a stone faced-revetted embankment which provided access to the main incline system to Blaengwawr Colliery. The cutting from the level portal survives as does the embankment, c1.2m high by c7m wide with a revetment on the southwest side constructed of five courses of roughly coursed snecked rubble, some blocks show traces of having been squared off. A length of Fe bar is embedded in the masonry, held in place by a curved cleat. The revetting includes yellow unfrogged bricks at points in the top course, which may be a later repair. Mature trees, including Silver Birch are growing from the bank and the revetting. Within the cutting leading to the level EA010.24, are several large shaped stone blocks with carved markings, possibly mason's marks. In the area to the northeast and north of the tramroad embankment are a number of slight linear features relating to later tramming lines (to tips) probably those shown on the 2nd edition OS map (1900), including a line to a tipping bay on the GWR (Dare and Cwmaman); these have replaced an earlier arrangement in this area depicted on the first edition OS map. The 3rd edition OS (1920) shows the final layout of the tramming lines with a route extended in a northwest direction to feature EA010.22 from the tramroad embankment over the entrance cutting to the then disused Level EA010.24, as well as further changes to the layout of the access lines to the GWR (Cwmaman) line. The route of the main northwest-south east line to EA010.22 survives as a linear hollow; the remains of a springing point for an arch over the entrance cutting to Level EA010.24 can be seen at the end of the tramroad embankment at the southeast side of the entrance cutting. The wider tramroad and incline system and its associated features would benefit from a detailed survey. The incline below Level Fach is covered in dense scrub.

EA010.23, archaeological significance: B/C

Header pond at Level Fach, a rectangular pond located at the southwestern corner of area EA010C depicted on the 1st edition OS map (1868) and on subsequent editions up to the 3rd (1920). It survives as a small rectangular reservoir, c9m by c12m, embanked on the north (downhill) side, with a bank, c1m high and c1.2m wide at the top. The feature, which remains water filled, survives in good condition and is a good example of its type.

Table 36. Subsidiary point and polyline features within EA010C

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA010.22	Engine mount, Level Fach	SO0016401960	Engine house
EA010.23	Header pond, Level Fach	SO0017801913	Pond
EA010.24	Level Fach	SO0020501910	Level
EA010.25	Blaengwawr & Level Fach combined incline & tramroad system	SO0030301857	Incline/Tramroad
EA010.36	Engine House?, Level Fach	SO0022301928	Engine House
EA010.37	Leat, Level Fach	SO0015301942	Leat
EA010.38	Tipping Bay, Level Fach	SO0023201959	Tipping Bay
EA010.39	Engine House, site of, Level Fach Incline	SO0029201853	Engine House

Blaengwawr (see figure 18)

Extractive landscape: Blaengwawr Quarry: EA011

EA011 Archaeological significance: A/B

Two sandstone quarries on the E facing slopes of Graig Rhiwmynach, above Blaengwawr at SN9980101398. The Aberdare Tithe map of 1844, shows the a much smaller quarry at the site of the northern of the quarries at Blaengwawr and its associated incline/tramroad. During the mid-19th century, the land parcel in which the quarry is located formed part of 'Blaen Gwawr', then under the ownership of a Richard Williams, and leased to an Evan Williams.

The 1st edition OS maps of 1868 describe that to the N as 'Old', ie disused, whilst that to the S is marked Quarry (stone), and appears to remain active. The quarry to the N, approached by a sunken zigzag path from Foundry Town, Aberdare, is slightly curved and aligned NW-SE, with tips extending down the N and S sides, its entrance lies to the SE. A small rectangular hut/shelter is depicted within the quarry on the S flanks of the main tip to the N side. The latter tip extends slightly E of the entrance. An incline runs ESE from a drum located at the SE end of the N quarry, to a tramroad which turns N to a second drum and incline (running NE) above Level Fach to descend to Blaengwawr Colliery with links beyond to the head of the Aberdare Canal (1st edition OS).

The S quarry is a mirror image to that at the N in layout. The southern quarry is later than the example to the north, as it is still active on the 1st edition OS map. It is formed of 2 arched embayments, the larger of which is to the north. It is shown served by a tramroad, which connects to the main incline at the N Quarry. At the S quarry spur lines are depicted; these run along the NE edge of the quarry face and onto the small linear tip E of the quarry entrance. A small rectangular hut (low stone-faced banks), long axis aligned E-W, is located S of the tramroad spur at the quarry entrance. Associated tips are located to the N, SE and E (1st edition OS).

The area is open and the features survive in relatively good condition, and include quarry workers' shelters/huts, drum house and incline head. The main features to survive in the area are as follows:

EA011.01, archaeological significance: A?/B

Drum, Blaengwawr Upper Incline, within Blaengwawr Quarry, a square structure with a smaller rectangular annexe to the south depicted on 1st edition OS maps (1868), and labelled as a drum, located below a 'chute' at the southern end of the northern quarry, at the head of the upper inclined plane serving Blaengwawr Quarries. The feature, 8m east-west and 6.1m north-south (maximum), survives as a substantial 2-cell structure, of massive construction, built of faced-rubble. It is terraced into the north-facing slope of the quarry entrance, and scarped into the slope. The larger compartment to the north-northeast is c.4.1m square, and the walls c1m in width, while the extent of the remains of the smaller compartment to the south-southwest are now of indeterminate due to collapse. Given its position, it is likely the larger northern compartment would have housed the winding drum of the incline.

EA011.02, archaeological significance: A?/B

Rectangular Feature, depicted on 1st edition OS maps (1868) at the entrance to at the entrance to the southern of the two quarries at Blaengwawr Quarry. The structure, c5m north-south and c6.5m east-west, is built into the north-facing slope of the quarry entrance on the south side of the tramroad. The walls comprise stone (platy slabs) and earth banks c1m wide with remnants of facing visible in the interior faces. An entrance was identified in the middle of the west side, facing towards the interior of the quarry, away from the prevailing wind. This feature is likely to be a quarry workers' shelter.

EA011.09, archaeological significance: A?/B

Tramroad, Blaengwawr Quarry, a tramroad depicted on the 1st edition OS map (1868) connecting the southern and northern quarries at Blaengwawr, with a spur at SN9973301291 to a tip east of the southern quarry entrance. The line to the northern quarry allowed access to the incline originally constructed to serve the northern quarry. The tramroad formation, where visible is typically c2.1m wide, and is sunken with stone revetting. Stone pads were noted on the surface of the formation at the entrance to the southern quarry.

EA011.11, archaeological significance: B

Sunken zig-zag path to quarry workings at Blaengwawr, a well-preserved steep, zig-zag path depicted on 1st edition OS map (1868) leading to the old quarry at Blaengwawr. Survives as a deep embanked and sunken linear switch-back path. Feature was covered in dense shoulder-high bracken at time of field visit.

EA011.03, archaeological significance: B/U

Rectangular Feature, Old Quarry at Blaengwawr, a small rectangular feature depicted at the entrance to the 'old quarry' on 1st edition OS maps (1868), the northern of the two quarries at Blaengwawr. The ephemeral remains of a structure or possible shelter, c3.4m east-west by 4.2m north-south, were noted at this location; comprising a linear stone spread and the remains of low footings. The spread of stone generally consists of sandstone, mainly of small stone chippings and a few larger blocks. Traces of ephemeral inner and outer facing were visible, though the banks are generally obscured in debris and tumble. The stone spread and stone footings indicate the outline of a temporary shelter, possibly of wood (and metal?). An indistinct access point appears to have been at the south end of the west side of the structure, facing into the interior of the quarry. Close by to the south of the structure is a small depression and a possible chute or slide which would have allowed material to have been transported downhill, and the head of the quarry incline.

Table 37. Subsidiary point and polyline features within EA011

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA011.01	Drum, Blaengwawr Upper Incline, Blaengwawr Quarry	SN9972801455	Winding Drum
EA011.02	Rectangular Feature, Blaengwawr Quarry	SN9973201284	Structure
EA011.03	Rectangular Feature, Old Quarry at Blaengwawr	SN9973101502	Structure
EA011.04	Concrete and brick platform, Blaengwawr Quarry	SN9968501593	Brick platform
EA011.05	Parallel linear depressions, Blaengwawr Quarry	SN9965501598	Depressions
EA011.06	Parallel linear features, Blaengwawr Quarry	SN9971101500	Linear features

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA011.07	Small trial workings, Blaengwawr Quarry	SO9981001138	Workings
EA011.08	Small sub-circular scoop, Blaengwawr Quarry	SN9975701198	Quarry scoop
EA011.09	Tramroad, Blaengwawr Quarry	SN9977201326	Tramroad
EA011.10	Drum, Blaengwawr Lower Incline, Blaengwawr Quarry	SO0014201728	Winding Drum

Bwllfa and Nant Melin Collieries (see figure 19)

Extractive landscape: Craig Nantmelyn: EA026

EA026 Archaeological significance: A-D

The surviving area lies on southeast facing slopes of Craig Coed above Nantmelin at SN9718602749, just north of the now cleared and landscaped sites of the Bwllfa and Nantmelin Collieries, and the later Windber Colliery, now part of the Dare Valley Country Park. The former Bwllfa Colliery comprised, along with its pit, smithy, sawmill, engine house, limekiln, screen, Sheave, associated tramroad and tips as well as brickworks site to the W, the now demolished Bwllfa Row, and the site of an associated tramroad junction with the GWR (Dare Branch) at the extreme E of the former colliery site (1st edition OS). The former Nantmelin Colliery comprised: pit, saw pit, 2 engine houses and a smithy, and associated structures (1st edition OS). An Old Level (coal) located S of the road also appears to have been cleared. A monument to the Nantmelin Colliery and its workers with a re-erected pit wheel now stands on the cleared site. The surviving reservoir in the area belonged to the Aberdare Water Works (1st edition OS).

The extractive area, first detailed on the 1st edition OS (1868), contains a quarry SW of Nant Melin stream, and a level (coal) at the W of the area (with a large linear tip to the SE) shown connected by tramroad and incline to the Nantmelin Colliery site (1st edition OS). A higher level of workings accessed by tramroad and an upper section of the incline (a drum is shown on the 1st edition OS): an old level (coal) is shown just W of the drum, and connected by a short length of tramroad to the ENE to a further level (coal) and tramroad spur, and tip downslope to SE; the latter level is of note as it retains a well-preserved portal. Later workings detailed on the 2nd and 3rd edition OS maps lie the NE, just beyond the borders of the area, and to the W. A small quarry is depicted upslope to the NW of the incline drum (1st edition OS); this is probably of an earlier date, as is marked old on 1st edition OS map. During the mid-19th century the majority of the area formed part of the ‘Cefn Gynnon’ property belonging to Major Gwynne Halford, and was leased to a Thomas Thomas. No industrial features were indicated on the Aberdare Tithe map of 1844. The most significant of the area’s surviving features are as follows:

EA026.01, archaeological significance: A?/B

Old Level, Craig Coed, Nant Melin, an old coal level depicted on 1st edition OS maps (1868), within an area of woodland to the north of Nant Melin Colliery. Very well-preserved level entrance and associated features, the level entrance has been cut into the south-facing slope, the arched portal, 1.42m in height, 1.77m to the centre of the arch, and 1.95m wide, is stone-built, possibly of drystone construction, though there were traces of what may have been deteriorated mortar bonding. A drystone wing wall projects from either side of the entrance portal, though it has collapsed on the west side; the wall on the east side is constructed of random rubble, stands 15 courses high, is 3m long and stands to 1.7m in height. A small fingertip lies downslope of the level portal, on the opposite side of the path, a former tramroad, which runs laterally in front of the level, between the portal and the tip, forming a level platform; this appears to have formed a tramroad spur/bay, or marshalling yard, which is 2.5m wide and increases from 1 to 1.7m in depth, revetted at the east end where it bounds the W side of the tip. The mouth of the spur/bay is at SN9713603053 (6.8m accuracy). The formation of the tramroad has been cut into the slope at its junction with the spur. Three Fe rails protrude from the section below the tramroad. A footpath (shown on the 1st edition map) runs upslope from above the level mouth. The entire

complex appears to have fallen out of use by the 1860s, as the level is labelled as "old" and the tramroad is shown dismantled.

EA026.02, archaeological significance: A?/U

Drum at Old Level, Craig Coed, Nant Melin, a rectangular structure located at the head of an inclined plane leading (EA026.15) to the Nantmelin Colliery site; depicted and labelled as a drum on 1st edition OS maps (1868), the structure has a small rectangular annex to the S projecting in line with the incline, and a small rectilinear feature abutting to the W. The upper part of the incline appears on the 1st edition OS in pecked outline, either indicating that it is under construction or disused at the time of the survey. A feature was identified at this location during fieldwork: this was as a rectangular stone structure, maximum external size c5m N-S, 4.1m E-W, plus a further 1.5m spread of rubble to the west, and 1m spread to the east, built of random rubble, with curved upper corners and internal vertical grooves set opposite within the lateral E-and W-facing walls (0.9m in width) . The structure is open on its S, though Fe bars formerly enclosed this side. It is possible, though as yet unconfirmed, whether this feature housed the winding drum or sheave for the incline depicted on the 1st edition OS map (1868).

EA026.10, archaeological significance: B/C

Brick Building, S of Craig Coed, Nant Melin, a ruined 2-storey brick building, built into the south-facing slope, with a double pitch roof, the south gable of which has an arched opening at first floor level, and a large double door opening, with an Fe lintel at ground floor level. The east elevation had two single and one double door openings, the latter lintel has collapsed. The bricks are bonded with a dark mortar. This structure is not depicted on 1st edition OS maps, but may be associated with the level shown on the 3rd edition OS map (1919) and is unlikely to be ironworks-related. The area and structure are very well-vegetated, with beech trees, and there is a platform area to the northeast.

EA026.14, archaeological significance: B/C

Tramroad to Level, Craig Coed, Nant Melin, a short length of tramroad, shown as a track on 1st edition OS map (1868) running westsouthwest from a level portal (EA026.01) to a hairpin bend which turns eastsoutheast to the head of incline (Upper section) EA026.15 at approx SN9708702998. The feature survives as a revetted and scarped track contouring the south facing wooded slopes. A wider area was identified down slope of the level portal for a marshalling area (see EA026.01).

Table 38. Subsidiary point and polyline features within EA026

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA026.01	Old Level, Craig Coed, Nant Melin	SN9716403048	Level
EA026.02	Drum at Old Level, Craig Coed, Nant Melin	SN9708503003	Winding Drum House
EA026.03	Old Coal Level, Craig Coed, Nant Melin	SN9709003007	Level
EA026.04	Coal Level, Craig Coed, Nant Melin	SN9702202920	Level
EA026.05	Old Air Shaft, S of Craig Coed, Nant Melin	SN9716302915	Ventilation Shaft
EA026.06	Old Coal Level, Nant Melin	SN9723302822	Level
EA026.07	Tramroad and incline, SE of Craig Coed, Nant Melin	SN9713602933	Tramroad/inclined plane

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA026.08	Quarry, Craig Coed, Nant Melin	SN9702802858	Quarry
EA026.09	Trackside feature, Craig Coed, Nant Melin	SN9702402909	Structure
EA026.10	Brick Building, S of Craig Coed, Nant Melin	SN9714702906	Building
EA026.11	Brick structure, Craig Coed, Nant Melin	SN9700902950	Structure
EA026.12	Rectangular brick structure, Craig Coed, Nant Melin	SN9702902964	Structure
EA026.13	Quarry, Craig Coed, Nant Melin	SN9705303030	Quarry
EA026.14	Tramroad to Level, Craig Coed, Nant Melin	SN9705502996	Tramroad
EA026.15	Incline (Upper section), Craig Coed, Nant Melin	SN9711302967	Inclined plane

Table 39. NMR Registers within EA026

Nprn	Name	NGR	Type
33698	WINDING ENGINE HOUSE, BWLLFA 1 COLLIERY	SN970024	ENGINE HOUSE
85001	WINDBER COLLIERY	SN97070295	COAL MINE
85002	BWLLFA DARE COLLIERY	SN96960241	COAL MINE
85003	NANTMEYLYN COLLIERY	SN97490272	COAL MINE

Hirwaun Common, West (see figures 20 and 21)

Extractive landscape: Twyn Canwyllyr: EA027A (see figure 20)

EA027A Archaeological significance: A/B

The area of Western Hirwaun Common (formerly Rhigos Extractive Area) centred on SN9338004213, excludes the area taken by the modern workings of Tower Colliery Drift. The area, which is named as 'Coal & Mine Works' on 1st edition OS 1" map c. 1840 (David & Charles Edn), comprises the upper slopes of Twyn Canwyllybren, taking in Tower Craig Level (coal), with its level, incline head engine house (5 conjoined structures), and other ancillary structures (4 shown on 1st edition OS, but not named), with tips to the N, and an incline (shown railed on the 1st edition OS) extending to the NNE, and a tramroad which divides in two to connect with the Hirwaun Ironworks to the NE, and, via a tramroad issuing from a drift/level at the later Tir Herbert Brickworks, to the Hirwaun Pond sidings of the GWR to the N. A further incline, part of a wider tramroad system extending to EA0027B from Craig Colliery (depicted on OS Surveyor's drawings of 1825 and shown disused on the 1st edition OS) extends NW across a stream (via a stone arched culvert) to connect with a network of paths (former tramroads?) near an airshaft and associated tips to the previously mentioned tramroad route to Hirwaun Ironworks, and also to the area of Hughes's patch and the route of Tappenden's Tramroad (IWT013a), via 3 or more possible routes.

To the S and above Tower Craig Level are 3 quarries with small irregular spoil tips downslope to the N; the quarry that to the E in is found in association with a trial level (1st edition OS); these workings (not named on the 1st edition OS) have indications of primitive scouring with hushing leats, parallel to the quarry faces tapping into mountain streams. Similar early workings are also found to the W, N and E of Tower Craig Level, extending E to just beyond Gorllwyn Level, itself S of the earlier Tower Colliery site, with an extensive network of hushing leats and scouring channels present, as well as evidence for water processing. At the E edge of the area in addition to the Gorllwyn Level (coal) is a further Old Level (coal) W of Tower Colliery, and its associated airshaft.

The slopes of the area display signs of having possibly been patchworked or scoured, particularly the quarries at the base of slope; the ground here is heavily disturbed, with gullies visible on the slopes and depressions and mounds below, in association with channels and leats. In addition to the major quarries mentioned above, there are several areas of minor diggings, c.1m or 2m square with the associated spoil downslope, generally ephemeral and well-vegetated, one typical example is c.2m by 4m, and c.0.7m deep, with a small barrow run off to the west. An old stone and earth boundary bank, c.0.5m high, runs through the area, from east-west, and adjacent to this is a short linear quarry, c.13m long and 3m high, probably associated with the construction of the bank, at SN9387804448 (6.2m accuracy). An area of disturbed ground, comprising a series of small platforms terraced into the slope with amorphous tips downslope at SN9398404507 (5.4m accuracy) appears to represent early small-scale surface workings. A typical example of the platforms is c.3.5-4m wide with a slight break of slope above. The whole area of disturbance is well-vegetated. To the west of level EA027.11 is a small quarry (probably for ironstone) with amorphous tips downslope, and stone and shale waste at the base of the tips in characteristic triangular splayed out form. The workings form three small quarry embayments retaining exposed rock face. A V-shaped chute leads downslope from the quarry. Above the face of this quarry a waterlogged area may be associated with former scouring activities; several irregular shaped channels contour the slope above the quarry face. At SN9346204807 (5.6m accuracy) a

stream or scour has been dammed and blocked by a small embankment c.1m wide on top, c.5m long and c.2m wide.

At the extreme E of the area a number of later, predominantly 20th century workings are located at Nant-y-bwlch; the 3rd edition OS first depicts a coal level with associated tips, engine house, and incline head located E of Nant-y-bwlch, with the incline extending NNE to join pre-existing tramroad/incline system to the later Tower Colliery site (formerly known as Four Feet Level (coal) on 1st edition OS) and with the tramroad spur to a tip W of the site of the earlier Tower Colliery (marked by the airshaft, but no longer named on the 3rd edition). A trackway is shown crossing the area from the NE to SW, linking the Tower Colliery/Four Feet Level tramroad network at the N, with the sandstone quarries at Cwar Canwyllbren, Rhyd-y-cyllell and Blaen Rhondda beyond. This track passes just S of the remains of Crawshay's Tower and an airshaft, whilst its route also passes near to 2 minor trial workings further to the W (1st edition OS).

The remains of the area are generally well preserved, the structures of Tower Craig Level area identifiable and preserved as low footings, whilst the bulk of the engine house also survives (the remains perhaps indicate an attempt to demolish the feature with dynamite). The NE incline survives; the incline head is preserved, though the incline has suffered damage and erosion. The course of the earlier NW incline survives as a grass-covered formation, with at least one well-preserved segmental headed stone-arched culvert. An area of earlier quarries and scoured/hushed workings also survive as an example of patchworking, lost elsewhere on Hirwaun Common. Finally to Crawshays' Tower, a structure of similar design to those at the Round Houses, Ty-mawr, Nantyglo. The walls survive to a height of over 1m, with the interior filled with collapsed masonry and iron superstructure. Enough survives to allow reconstruction and interpretation.

The most significant of the surviving sites, including RCAHMW entries, are detailed below, where available descriptions of NMR sites augmented during the course of the current survey are given in italics:

EA027.26, archaeological significance: A?/B

Tower Craig Level Incline I, Hirwaun Common, the earlier of two inclines which served the area of Tower Craig Level. It is depicted on the 1st edition OS map (1881) as a track running northnorthwest (ie it is disused). The feature survives as a substantial embankment c.6.5m wide on top, and over 5m high at some points; it crosses a series of slight gullies, several relating to scouring channels. The upper part of the incline has been partially tipped over by waste from Tower Graig Level. At the point of the culvert EA027.27, the top of the incline narrows to c.3.6m, this may relate to a deliberate narrowing of the embankment or to a partial collapse of the feature. Approximately 15m below of the culvert, the southwest side of the incline is scarped into the slope.

The 1st edition OS map shows a later replacement incline (railed on the map) further to the east (see EA027.30). By this date it appears the upper part of incline EA027.26, had been tipped over and was disused.

EA027.27, archaeological significance: A?/B

Culvert, Craig Level Incline I, Hirwaun Common, a culvert carrying the incline EA027.26 over a stream gully, IWW932, feature has a stone-built arch on the west side, c0.8m high and c1.5m wide; survives open on the west side, and partially collapsed on the east.

EA027.15, archaeological significance: B/C

Trial Level, Hirwaun Common, a linear trial level cutting, c.21m in length (WNW-ESE), between c.2.2m wide at the base and 8m at the top of the cutting, cut into the slope; base is reed-choked, with some exposed stone at the entrance, and a small curving spoil tip, c.18m in length, extends from the northeast side of the entrance cutting curving to the west.

EA027.17, archaeological significance: B/C

Trial Level, Hirwaun Common, a series of small workings terraced and stepped into the slope, aligned SSE-NNW in 3 steps, with two linear tips extending from the base of the second stage and a spread fan shaped tip at the downslope end; the entire feature extending to over 47m in length. A possible airshaft, or possible chimney base is located on the upper step at the head of the complex. This is a small brick-lined circular stack or shaft, c1m wide and c1.2m deep, with jumbled brick at the base, the brickwork lining appears to have been pushed in on itself from the north side. The brick lining of the shaft feature comprises a single thickness of yellow unfrogged bricks placed end-on. The shaft is set on a platform c4m by 4m, c0.4m deep defined by 2-3 courses of roughly placed stone. There is a series of quarry/level workings downslope from this, firstly a cutting, c.8m in length by c.7.5m in width, directly below the shaft, possibly the site of a level entrance, with a further slight cutting, c.7.5m in length by c.4m in width, below this and three fingertips extend down the slope. This area is labelled as a trial level on the 1st edition OS map (1881).

EA027.19, archaeological significance: B/C

Quarry and tips, Hirwaun Common, an area of abandoned linear workings depicted on the 1st edition OS map (1881), extending over 180m east-west; small areas of exposed rock face, the largest c36m in length, up to 1.5m high, with scouring channels extending from above, several of which actively drain downslope. The bench or 'level area cut' below the face extends northeast by between c.15m and c.23m. A small level has been cut into the rock face at the east, and small short curving spoil tips extend below. This site is closely related to EA027.18, which is a westerly extension of the same workings.

EA027.22, archaeological significance: B/C

Long quarry workings, Hirwaun Common, an area of abandoned linear workings, c. 137m east-west, depicted on the 1st edition OS map (1881); a long linear quarry with amorphous tips downslope and indications of small rubbish mounds and debris on the slopes immediately west of the quarry. A gully approaches the west side of the workings from below; this may have provided an access point though potentially began life as a former scouring channel. The quarry faces show signs of having been scoured. Several 'natural' or semi-natural water channels drain the area; these features are likely to have been the reason for the focus of early mining in the area as initially minerals would have exposed in stream gullies, and later deliberately scoured. The main scour is probably an adapted natural stream, with a steeply angled bank on the west side channelling the water into the quarry. An ephemeral gully, c0.2m deep and c1.2m wide, runs from east-west above the quarry face; this channel, likely part of the scouring system, is truncated to the east by an enlarged quarry embayment, though there are indications that it

originally also continued above this area. At the east end of the quarry, there is another major curving scour with a bank channelling the water into the workings.

EA027.23, archaeological significance: B/C

Boundary bank, Hirwaun Common, a major and extensive boundary bank, c1.5m wide, between c.0.5 and c.1m in height, running roughly east-west contouring the hillside and with an intermittent ditch on the upper side, in places scarped into slope.

EA027.32, archaeological significance: B/C

Quarry, SE of Tower Craig Level, a small quarry, c. 63m in length NW-SE, depicted on 1st edition OS map (1877), aligned NW-SE, quarry face to SW, steep sided waste tips to NE. Evidence of scouring/hushing (EA027.33) in form of leat running SE-NW to SW above quarry face. Adjacent Trial Level (EA027.11) at E end.

EA027.34, archaeological significance: B/U

Old Ironstone Workings, E of Tower Craig Level, an extensive area of ironstone workings indicated on the 1st edition OS map (1877) extending W-E between SN9377004684 and SN9411104663 (at a major N-S boundary bank) along the N facing slopes of Twyn Canwyllyr (Twyn Canwyllbren) with two major scouring/hushing gullies at SN9377804647 and SN9388104644. The workings are no longer named or connected by transport networks on 1st edition OS, therefore, are likely to be long disused by this date. The OS 2" to the mile Surveyors' Drawings of 1814 indicate a 'Mine Works', ie ironstone workings at this general location. The 2 major hushing scours with associated leats at the W end of the site are well preserved, as are banks/waste tips. The E part of the area has been disturbed by a modern track associated with Tower Colliery Drift. An area containing numerous braided stream gullies, probably associated with scouring was noted on the steep mountainside above to the S. These features are extensive and will require further in depth study.

EA027.35, archaeological significance: B/U

Old Ironstone Workings, NW of Gorllwyn Level, an extensive area of ironstone workings depicted on the 1st edition OS map (1877) extending W-E from a major N-S boundary bank between SN9409104610 and SN9451404547 along the N facing slopes of Twyn Canwyllyr (Twyn Canwyllbren) with three major scouring/hushing gullies at: 1) SN9413904645; 2) SN9435304560 site of the Gorllwyn Level (EA027.14); and 3) SN9438404480, which in fact splits in two near this point, each branch with small quarries at SN9438304502 and SN9439504485, associated with this quarrying activity to the NNE are 2 conjoined substantial tips (surviving), with a smaller linear tip downslope at the NW of the latter (now largely destroyed), with the site of an adjacent well (1st edition OS map). A number of smaller scouring gullies, visible on APs are located within the area, as are a number of leat features (hushing leats) extending to the quarry faces, possibly hushing leats. In addition to Gorllwyn Level, the ironstone workings area takes in an old coal level (EA027.13). Apart from the old coal level (EA027.13) and the Gorllwyn Level (EA027.14), the workings are no longer named, and only the old coal level is connected by then current transport networks on 1st edition OS. Generally, therefore, the workings are likely to be long disused by this date. The OS 2" to the mile Surveyors' Drawings of 1814 indicate a 'Mine Works' at this general location, connected to Hirwaun ironworks via tramroad/haulage track (a feature now lost to the modern Tower Colliery Drift workings). Numerous braided stream gullies, probably associated with scouring was noted on the steep mountain side above to the S and SW. These features are extensive and will require further in depth study.

EA027.30, archaeological significance: B-D

Tower Craig Level Incline II, Hirwaun Common, the later linear incline serving Tower Craig Level depicted railed on 1st edition OS map (1877), aligned SSW-NNE (surviving between its head at SN9358304708 and the edge of reclaimed area at S9371405002), formerly giving access via Tramway to the GWR (Vale of Neath Section) to the NNE, and also via Tramway to just W of Four Feet Level and thence by an Old Tramroad (disused on 1st edition OS) to Hirwaun Ironworks to the ENE. Formation of incline, steep sided and grass covered, now heavily disturbed by water erosion and posts for overhead services. Junction of Tramway spur (at SN9369704062) to Hirwaun Ironworks shown on 1st edition OS, spur traceable on APs (within boggy area) to edge of reclaimed land at SN9379905008.

01797m, archaeological significance: A?/B

Crawshay's Tower, Hirwaun Common, located high on the north-facing slopes of Twyn Canwyllyr at SN94150442 and overlooking the site of Tower Colliery, Crawshay's Tower, is similar in style to the Round Houses at Nantyglo. c.1820. The Tower, built by the Crawshay family, acted as a folly or prospect tower. The GGAT 80 year 6 fieldwork noted the round base of the tower survives, external diameter 5.89m, with an entrance 0.95m wide on the southeast side. The walls 1.02m thick, are now however much reduced in height, standing to just over 1m, their exact height masked by tumble around the base. The structure previously stood to within 12ft of ground level, according to an earlier description. The Tower is built of stone, with a rubble core and dressed masonry facing, bonded with a pale grey mortar. The remains of the collapsed roof structure, riveted Fe sheets, lie within the interior.

Nprn 91588, archaeological significance: A?/B

Tower Graig Level, Hirwaun: "Site marked on 1948 O.S. 1:10560 map as 'disused'. (RCAHMW; NMR; Coflein).

Depicted on the 1st edition OS map (1881) as a complex of buildings at the head of an incline, with tips and the tramming lines, labelled as Tower Craig Level (coal). The lobed tips associated with the level are well defined, and the remains of three structures/buildings survive.

The main structure, c16m (north-south) by c6m (east-west) and c1.5m in height, ranges down the east side of the complex; this is a very substantial north-south aligned wall or basal structure of dressed coursed masonry facing, and brickwork to details with a rubble core. The structure shows signs of being extended: the southern section is bonded with coal-rich mortar; no bonding material was visible within the north section (lime or drystone construction?). The interior of the structure is masked by demolition material (including stone rubble and red and yellow unfrosted brick). There is a long niche in the west elevation, with brick quoins on the south side of the niche. A straight row of over 6 holding down bolts protrude from the top of the structure. Debris in the surrounding area includes corrugated iron roofing sheets and lengths of Fe rail; possible remnants of the superstructure. A bank and depression on the west side of the structure lines up with the incline (EA027.30) to the north. Cables and the remains of machinery, associated with the winding mechanism, and also possibly to ventilation equipment lies to the south of the structure and includes a wheel, marked "Crompton". To the west of the main building is a rectangular platform, c1.6m by c1.2m, surviving to 1.45m in height (5 courses) of yellow brick. Adjacent to this is a damaged brick pillar; the complex has the appearance of having been deliberately destroyed.(possibly by explosives).

Ancillary colliery structures also survive as low footings; at the centre of the complex, a rectangular structure, c9m north-south by c5m east-west, is defined by low walls c0.5m wide by

c0.4m high; the north wall stands to a maximum of 6 courses, facing stones remain visible on the interior of the north and west walls. The interior of the building is sunken; the remains of a dram amongst the internal debris. Remains of possible structural elements include a length of Fe rail tied with four Fe bolts. At the western edge of the complex is a small rectangular structure, c4m by c4.5m, slightly cut into the tip to the west, its upper northwest corner disturbed with tumble in the interior and downslope.

Nprn 226638, archaeological significance: A?/B

Crawshays Tower, Hirwaun: “1. Crawshays tower, similar to Nantyglo. C.1820. Structure remains within 12ft of ground level; considered suitable for listing. 2. Circular stone tower, ruined, stands to max 4m in height” (RCAHMW; NMR; Coflein). *See also 01797m.*

Table 40. Subsidiary point and polyline features within EA027A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA027.07	Air Shaft, Hirwaun Common	SN9346704962	Ventilation Shaft
EA027.08	Air Shaft, Hirwaun Common	SN9372401893	Ventilation Shaft
EA027.09	Old Coal Level, Hirwaun Common	SN9406204821	Level
EA027.10	Air Shaft, Hirwaun Common	SN9405004805	Ventilation Shaft
EA027.11	Trial Level, Hirwaun Common	SN9380904541	Level
EA027.12	Air Shaft, Hirwaun Common	SN9407504423	Ventilation Shaft
EA027.13	Old Level, Hirwaun Common	SN9429104645	Level
EA027.14	Gorllwyn Level, Hirwaun Common	SN9434704547	Level
EA027.15	Trial Level, Hirwaun Common	SN9303604574	Trial level
EA027.16	Track/leat, Hirwaun Common	SN9307304573	Trackway/leat
EA027.17	Trial Level, Hirwaun Common	SN93247804747	Trial Level
EA027.18	Linear Quarry, Hirwaun Quarry	SN9351704633	Quarry
EA027.19	Quarry and tips, Hirwaun Common	SN9362504573	Quarry
EA027.20	Platform, Hirwaun Common	SN9351304682	Platform
EA027.21	Stone-built platform, Hirwaun Common	SN9314604699	Platform
EA027.22	Long quarry workings, Hirwaun Common	SN9353604529	Quarry
EA027.23	Trackway, Hirwaun Common	SN9380204476	Trackway
EA027.24	Leat, Hirwaun Common	SN9374704604	Leat
EA027.25	Leat, Hirwaun Common	SN9378104650	Leat
EA027.26	Tower Craig Level Incline I, Hirwaun Common	SN9346904937	Incline
EA027.27	Culvert, Craig Level Incline I, Hirwaun Common	SN9351104819	Culvert
EA027.28	Leat, Hirwaun Common	SN9373004589	Leat
EA027.29	Leat, Hirwaun Common	SN9377804645	Leat
EA027.30	Tower Craig Level Incline II, Hirwaun Common	SN9364804855	Inclined Plane
EA027.31	Trial Level?/Linear Working, N of Tower Craig Level	SN9379804916	Level?
EA027.32	Quarry, SE of Tower Craig Level	SN9377204545	Quarry

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA027.33	Leat, E of Tower Craig Level	SN9377704505	Leat
EA027.34	Old Ironstone Workings, E of Tower Craig Level	SN9395604690	Ironstone Workings
EA027.35	Old Ironstone Workings, NW of Gorllwyn Level	SN9427604582	Ironstone Workings
EA027.36	Chwar Canwyllbren Quarry	SN9318403772	Quarry
EA027.37	Track from Hirwaun to Rhyd-y-cyllyll	SN9369004361	Track
EA027.38	Track spur to Chwar Canwyllbren Quarry	SN9320304040	Track
EA027.39	Track to Tower Craig Level	SN9376904727	Track

Table 41. NMR Registers within EA027A

Nprn	Name	NGR	Type
91588	TOWER GRAIG LEVEL, HIRWAUN	SN93570470	COAL MINE
226638	CRAWSHAYS TOWER, HIRWAUN	SN94110439	TOWER
91587	TOWER DRIFT MINE, HIRWAUN	SN94140476	COAL MINE

Table 42. HER Registers within EA027A

Prn	Name	NGR	Type
01797m	CRAWSHAY'S TOWER, HIRWAUN COMMON	SN94150442	Tower
02498.0m	BUTE COLLIERY AND HIRWAUN TRAMWAY	SN95200505	Tramway

Extractive landscape: area north of Bute Pit: EA027B (see figure 21)**EA027B Archaeological significance: U**

A discrete area of relatively small-scale workings located south of Hirwaun on the east side of Nant-y-Bwlch at SN 95165 05119; the extractive features of the area appear to have been largely reclaimed, though the tips survive in an overgrown state. The main elements within this area were its transport network, which include an early tramroad which linked to the original Tower Colliery site, via Four Feet Level, and a Tramroad branch to Tower Craig Level in area EA027A, both shown on the OS Surveyor's Drawings of 1825; the latter described as an 'Old Tramway' on the 1st edition OS map of 1877/1885. The route of the Aberdare Rhondda Railway, with its sidings and tipping lines associated with Bute Pit is first depicted on the 1st edition OS map, cutting diagonally across the southern part of the area.

The main extractive feature of the area was an old coal level and its associated finger tips, located to the NW of the former Bute Pit site (now reclaimed). The large tips associated with the old level are now heavily overgrown (gorse and brambles), while the immediate area of the level, also overgrown, appears to have been reclaimed, or at least heavily disturbed.

The main tramroad route to Tower Colliery has been fossilized in the route of the modern metalled lane, whilst a short linear fragment of the tramroad branch to Tower Craig Colliery appears to survive as low ephemeral earthworks/parch marks. The Aberdare Rhondda Railway

has been largely replaced by a modern track within the area, though the sidings/tips survive in poor condition as grassed-over embankments and cuttings within recent forestry plantation.

Table 43. Subsidiary point and polyline features within EA027B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA027.03	Trackside feature, N of Bute Pit, Hirwaun Common	SN9520304995	Structure
EA027.04	Trackside feature, N of Bute Pit, Hirwaun Common	SN9517704946	Structure
EA027.05	Trackside feature, N of Bute Pit, Hirwaun Common	SN9517204938	Structure
EA027.06	Old Level, NW of Bute Pit, Hirwaun Common	SN9505605086	Level
EA027.40	Former tramroad to Four Feet Level area, Hirwaun Common	SN9514105082	Tramroad
EA027.41	Former tramroad to Level NE of Four Feet Level, Hirwaun Common	SN9512205200	Tramroad
EA027.42	Former tramroad, N of Four Feet Level, Hirwaun Common	SN9514005224	Tramroad

Table 44. HER Registers within EA027B

Prn	Name	NGR	Type
03233m	254 COAL TIPS, BRYNGELLI	SN95200534	Spoil heap

Extractive landscape: Knobby Drift: EA027C (see figure 21)

EA027C Archaeological significance: B/C

A discrete area of relatively small-scale workings to the south of Hirwaun on the west side of Nant-y-Bwlch at SN9552904879. The extractive features depicted on the 1st edition OS map (1877/1885) include Knobby Drift ironstone mine and its associated tips. The tips remain, and the cutting for the mine entrance is extant, though it has been partially landscaped. The HER description (Prn 03232m) for the site located at SN95590491 mentions the ‘ironstone pit was served by a tramway which fell into disuse before it was surveyed for the O.S. in the 1870s’ and that the ‘quarry supplied ironstone to the Hirwaun Ironworks during the mid 19th century’. The main feature to survive were the low footings of a building set on top of the tip at the Knobby Drift site, possibly the site of the Drift Mine’s winding engine, the details are as follows:

EA027.02, archaeological significance: B/C

Building, Knobby Drift, probably an engine house, depicted on 1st edition OS maps (1877/1885) to the north of Knobby Drift (Ironstone) at SN9556904956, on the west side of a short length of tramroad which runs due north from the drift mine entrance. A platform area, 18m north-south by 12m east-west, is visible at this location, the ground at this point has been disturbed. There is also a small structure, 2.5m by 3m, comprising grassed-over stone-built footings, and brick visible on the surface. A number of small depressions and scoops were also noted in the vicinity.

Table 45. Subsidiary point and polyline features within EA027C

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA027.01	Rectangular water feature, Knobby Drift	SN9557304756	Reservoir/Tank
EA027.02	Engine House at Drift, Knobby Drift	SN9556904956	Engine House

Table 46. HER Registers within EA027C

Prn	Name	NGR	Type
03232m	274 KNOBBY DRIFT IRONSTONE PIT, JOHNSON PARK	SN95590491	Drift mine

Hughes's Patch (see figure 22)
Extractive landscape: Hughes's Patch: EA028
EA028 Archaeological significance: C/D

An area of partially reclaimed patchworking, northeast of Rhigos to the south of Rhigos Road (at SN9291706067). The 1st edition OS map shows three adjacent opencast quarry embayments which range along the S of the area; the W and central quarry embayments are shown flooded, that to the E contains an Old Level (ironstone). The main quarry is that in the centre, which is depicted as being excavated to a considerable depth and having a large semi-circular quarry face with at least 5 linear tips extending from its SE flank. An extensive area of tipping with lobed tips at the end of former tramming lines lies to the N and NW, while a narrow linear tip aligned approximately N-S divides the W and central quarries. A tramroad, marked 'Old Tramway' takes a curvilinear E-W course across the area from Tappenden's Tramroad to the NW edge of the tipping area. A N-S aligned incline with engine at its head (N), close to the route of the 'Old Tramway', accessed the central quarry embayment. The engine is set within a two-unit rectangular structure, with a small rectangular annex to the S, and further S linked by a short length of walling a freestanding rectangular structure W of and adjacent to incline. To the E of the incline head (with its engine house), immediately NE of the 'Old Tramway' is a small reservoir.

The E quarry and its level are connected by track (former tramroad) to the 'Old Tramway' and to Tappenden's Tramroad and the site of a tip further N, beyond the area (now removed). E of the Level entrance, adjacent to a spur leading SE off the approach tramroad are 4 or more short linear tips aligned W-E (1st edition OS).

Permission for access to this area was not obtainable at the time of the field visit, however, a review of recent aerial photographs showed the key central and E quarries had been infilled and much of the area landscaped. Aerial photographs also confirmed that only the flooded area of the W quarry and the N and W extent of the lobed tips along the N part of the area survive in a recognisable form. The infilled/drained remains of the incline head reservoir appear to survive.

Table 47. Subsidiary point and polyline features within EA028

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA028.01	Building, Hughes's Patch	SN9289906099	Building
EA028.02	Trackside Feature, Hughes's Patch	SN9289606088	Structure
EA028.03	Old Ironstone Level, Hughes's Patch	SN9297705977	Level
EA028.04	Former tramroad, Hughes's Patch	SN9290906111	Tramroad
EA028.05	Former tramroad, Hughes's Patch	SN9302005998	Tramroad
EA028.06	Former incline, Hughes's Patch	SN9290306043	Inclined plane

Table 48. NMR Registers within EA028

Nprn	Name	NGR	Type
88071	HUGHES' PATCH (IRONSTONE WORKINGS)	SN93070600	IRONSTONE WORKINGS

Table 49. HER Registers within EA028

Prn	Name	NGR	Type
01795m	HUGHES PATCHES	SN92900600	Patchworking

Llwydcoed Quarries (see figure 23)

Extractive landscape: Old Ironstone Level: EA029

EA029 Archaeological significance: B/C

A single Old Level (ironstone) within enclosed land on a gentle SW-facing slope located just N of the Old Neath - Merthyr Road (at SN9982706927). The area is known to have been part of the Honourable Robert Henry Clive's estate during the mid-19th century (Aberdare Tithe 1844). The level is first depicted on the 1st edition OS map (1885), then disused, as a narrow cutting c.4.5m in width (max), aligned SW-NE, widening towards its NE end (site of portal) with linear tip extending to SW (1st edition OS).

The feature and its tips survive in relatively good condition for its type, though the level portal has collapsed, or been infilled. Feature 03214m was not located.

Table 50. Subsidiary point and polyline features within EA029

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA029.01	Old Ironstone Level, Llwydcoed Quarries	SN9983306890	Level

Table 51. HER Registers within EA029

Prn	Name	NGR	Type
03214m	230 DAM AND POSSIBLE SLUICE SYSTEM	SN99690690	Earthwork

Pontbren Llwyd Quarry (see figure 24)**Extractive landscape: Pontbren Llwyd Quarry: EA030****EA030 Archaeological significance: U**

An irregular area of stone quarry extraction (at SN9487208018) with its main face along its SW edge and a further semi-circular quarry scoop at its E side. The 1st edition OS depicts tips within the centre, SE and NE of the site. A small L-shaped pond-like feature is depicted in the area W of and above the NW angle of the main quarry face. A railed tramroad connection with the line of Mr Glover's Rail Road (IWT014), extends N from the main quarry, with a spur extending E to the semi-circular quarry scoop and its linear tip at the S. Later edition OS plans chart the expansion of the quarry to the W. It is known that the route of the internal tramroad (route of old tramroad depicted on modern mapping) was largely altered and extended along the N of the area to serve the workings to the W by the survey of the 2nd edition OS.

It was not possible to establish ownership at the time of the field visit and as a result the area, though viewed from an adjoining lane, was not accessed. A review of the latest aerial photographs indicate that the tramroad connection to Mr Glover's Railroad has been all but removed by 20th/21st century development, as has the quarry scoop (and its associated tip) at the E of the area. The rest of the area is now largely masked by mature woodland.

Table 52. Subsidiary point and polyline features within EA030

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA030.01	Quarry, Pontbren Llwyd	SN9491308019	Quarry
EA030.02	Tramroad system, Pontbren Llwyd Quarry	SN9503408193	Tramroad
EA030.03	Quarry scoop, site of, Pontbren Llwyd Quarry	SN9501008014	Quarry scoop

Table 53. NMR Registers within EA030

Nprn	Name	NGR	Type
308303	PENDERYN QUARRIES: CHURCH ROAD QUARRY, PENDERYN	SN948081	QUARRY

Table 54. HER Registers within EA030

Prn	Name	NGR	Type
02105m	PONTBREN LLWYD	SN9508	Furnace

EA032 Penderyn-foel (see figure 25)

An extractive area comprising an extensive area of limestone quarries at Penderyn-foel to the northwest of Tor-y-foel farm, Penderyn (at SN9408709021), the earliest and best-preserved of a series of quarries within the Penderyn area. As the coke fired ironworks at Hirwaun began production in 1757, the earliest of the quarries within EA032 must have been operating from this period; the most-likely candidates for the earliest workings associated with the provision of limestone for fluxing purposes are EA032A, and the small outlying quarry EA032.16. Other possible early sites include an area of small-scale quarries south of area EA032B at SN9378608511, on the south facing slopes of Penderyn-foel below two parallel outcrops, and an area of enclosed and now wooded land with a limekiln, and possible quarried outcrops noted on the 1st edition OS at c.SN9430608711, to the south of Tor-y-foel farm. The latter two sites have not been investigated further during the current project.

In 1793 the fledgling Aberdare Canal Company leased land in the area and sublet a quarry (EA032A) to Thomas John Llewelin, with an initial investment of 5 guineas and loan of ‘two planks and two wheelbarrows out of the company’s stock.’ This relates to the quarry named as ‘Lime Works’ (extractive area EA032A shown) on the 2" to the mile OS drawings of 1814, and on 1st edition OS 1" map c.1840 (EA032A and EA032B shown). Van Laun notes that in 1830, the lime works at Penderyn-foel, little changed in size from the quarry of 1813, was the only one in the area in operation, and that Hirwaun, Aberdare and Abernant ironworks relied on this small area for their entire limestone requirement. It was only in 1846 that Aberdare began limestone quarrying at Ysgubor Fawr (Cwar Mawr quarry), though retaining quarrying rights at Tor-y-foel. By the mid-19th century the lime works, formed part of the ‘Tor Vole’ (Tor-y-foel) property (then noted as ‘coedcae’ and under pasture) of Morgan Morgans Esq, leased to a Gwenllian Howells (Penderyn Tithes Map 1840).

Initial quarrying would have been carried out using a ‘plank and barrow’ method utilising bar and pick, superseded c.1800 by a combination of leverage and the use of derricks, drilling and blasting with black powder, with the stone won along the line of the strike. Because of the relatively small size of the quarries on Penderyn-foel stepped long-wall working, utilising galleries, and common from around 1850, was not developed at Penderyn-foel. The expansion of the quarry into area EA032B, is likely to have occurred between 1819 and 1840, reflecting the most profitable period with the expansion of Abernant and Aberdare Ironworks, and indeed the Hirwaun Ironworks from the 1820s.

From 1846 the demands for limestone from Aberdare, and Abernant appear to have been largely met by the Cwar Mawr quarry, whilst the fortunes of the largely unprofitable Hirwaun ironworks, suffered further after the first half of 1859, when the Crawshays abandoned the works, thereafter Hirwaun only saw short-lived sporadic operation until final closure. Area EA032D, interestingly does not appear on the cartographic record, and might relate to a ‘failed’ and relatively short-lived expansion dating to the 1840s or 1850s.

Extractive Area EA032E, first appears on the 3rd edition OS map of 1904, disused by 1918 probably following on the closure of the Abernant Works in 1906, this quarry appears to have been radically extended at a later period during the 20th century probably for roadstone.

Extractive landscape: Penderyn-foel Quarry Area: EA032A

EA032A Archaeological significance: A

Area EA032A consists of 2 large quarry embayments, on the NE-facing slopes of Moel Penderyn. The 2" to the mile OS drawings of 1814 label the area as a 'Lime Works' and depicts a tramroad entering the area from the E, which splits to the SW and NW as it approaches the quarry faces (within area EA032A). The 1" OS 1st edition c.1840 (David & Charles edn.) also shows a tramroad on the same alignment giving access to the quarry faces within EA032A. This tramroad is likely to be on the line of the original wooden Railroad constructed in 1799 by Thomas John Llewelin. The late 19th century 12" 1st edition OS (1885) shows a tramroad, on again on the same alignment, entering the area at the E with a spur approaching the SW quarry face from the NNE (the westerly extension of 'Mr Glover's Railroad' IWT014). Associated linear tips are shown to the N and E, downslope.

The main face of quarry comprises two large N-S aligned embayments; the northern is c103m across, while the southern is c63m across. The remains of waste and limestone blocks are preserved *in situ*, and there are grassed over mounds of waste at the base of the quarry face, and a number of smaller quarry scoops visible around the main embayments. The main quarry faces form a series of ledges and steps, comprising small embayments and level working platforms or benches. The uppermost ledge in the northern embayment being c3.6m high.

The limestone strata dip to the south, and in the southern embayment the limestone bedding planes are still visible, forming stepped areas in the face where the stone has been removed from above. In places, drill marks are still visible in the stone of the faces. Material (hay bales etc) has been dumped within the quarry embayments and now obscures line of internal tramroad.

A level (silica) lies at the southern extent of the area; its associated tramming lines and linear tip extend to the northeast of the level portal (1st edition OS map 1885). The portal survives, though is now partially collapsed and blocked.

The most significant of the surviving sites, including RCAHMW entries, are detailed below, where available descriptions of NMR sites augmented during the course of the current survey are given in italics:

EA032.14, archaeological significance: A?/B

Brake Engine Emplacement associated with Level at Tor-y-foel, feature comprises the remains of a brake engine emplacement, which sits on an elevated platform S of incline EA032.05: a rectangular, almost square, sunken area, 2.74m north-south by 2.56m east-west, c.0.2m deep, with 4 upright Fe tie rods, one at each corner. The tie rods are square-topped with a round section, 2.24m apart north-south, and 2.06m apart east-west (the one in the northeast corner has been bent out of true). This emplacement would have held a brake mechanism and horizontal wheel. To the east of the sunken rectangular area is a sunken linear slot, c1-1.5m wide, with two linear arrangements of parallel stone; the guide channels for the incline cables. There are embankments on the north and south sides, with a stone scatter, and a small sub-circular depression to the northeast of the sunken area. This emplacement appears to be associated with the tramming lines/incline system belonging to Level EA032.15 and a tip to the NE.

EA032.15, archaeological significance: A?/B

Level at Tor-y-foel, a level, depicted on the 1st edition OS map (1885) with associated tip to NE and tramming lines. Also on 2nd edition OS map (1904), where named as level, and shown linked by extended tramming line to more substantial tip further to the NE, and also linked by a short length of tramroad (incline?) to the line (on the course of IWT014) serving quarry EA032A. The level opening, c0.8m high and 0.6m wide, and over 1m deep inside, driven from the east, has partially collapsed. The arched tunnel vault of the level is constructed of brick, and comprises a double thickness of brick. The feature was previously closed off: two upright metal rods to either side of the entrance, c2.75m to the east of the mouth, 1.75m apart and c1.05m high, while a piece of metal sheeting lies on the north side. The slightly splayed rectilinear entrance cutting, 3.75m wide, by c13m, extends to the east of the portal site aligned on feature EA032.14. A number of large blocks of stone were noted in the area of the cutting. This level has been identified as probably relating to silica mining for the brickworks located alongside the Vale of Neath Railway at Hirwaun at SN961060 (van Laun 2001, 198).

EA032.29, archaeological significance: B/C

Tramroad associated with level at Tor-y-foel comprises 3 tramroad tipping lines shown railed on the 1st edition OS map (1885) and issuing from level EA032.15, extending northeast on to an associated linear tip, and towards site of possible former tipping bay (EA032.13). Route of tramroad towards tip traceable, the associated tip has been considerably developed by 2nd edition OS map (1904), and the line of the tramroad modified in this area.

EA032.28, archaeological significance: A?/B

Tramroad, Penderyn-foel, a track shown on the 1st edition OS maps (between SN9374709032 and SN9439609215) and subsequent editions extending from the SW edge of the quarry area near Tor-y-foel Farm to the area of quarries EA032E (quarries here first depicted on 2nd edition OS, 1904) at the N of the area, and a junction with the Penderyn Tramroad (Nprn 88073), or 'Mr Glover's Railroad' (IWT014). The 1st edition OS map depicts a footpath running NW towards the parish road from the SW end of the Tramroad (this footpath has been included as part of the feature). The feature, embanked and revetted in places, now a farm track, originated as a tramroad; two lengths of joined in situ Fe rail were noted at SN9413409062 (8.6m accuracy) during the field visit. Three holes in the plate, one rivet in situ. This is one of a number of lengths of rail noted along the line of track.

Nprn 88073, archaeological significance: A?/B

Penderyn Tramroad: No further information recorded (RCAHMW; NMR; Coflein). *Same as IWT014 ('Mr Glover's Railroad'); see year 3 GGAT80 report.*

Table 55. Subsidiary point and polyline features within EA032A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.03	Tramroad spur, Penderyn-foel	SN9414209054	Tramroad
EA032.13	Revetting on incline EA032.05	SN9412808939	Revetment
EA032.14	Brake Engine Emplacement, associated with Level at Tor-y-foel	SN9412308921	Brake Engine Emplacement
EA032.15	Level at Tor-y-foel	SN9409808898	Level
EA032.29	Tramroad associated with level at Tor-y-foel	SN9411608908	Tramroad

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.28	Tramroad, Penderyn-foel	SN9415609038	Tramroad

Table 56. NMR Registers within EA032A

Nprn	Name	NGR	Type
88073	PENDERYN TRAMROAD	SN94140901	TRAMWAY

Extractive landscape: Penderyn-foel Quarry Area: EA032B**EA032B Archaeological significance: A**

The area (at SN9390708865) consists of a main linear E-W aligned quarry face facing N, forming a deep cutting, with the tips lying to the N. These tips are steep-sided and linear. A major lobed tip (c.135m N-S) is located centrally along the N edge of the quarry and extends to the N, while a series of lower small-scale tips, probably earlier and the result of overburden removal, lie to the NW. At the NE, further low curvilinear tips probably relate to overburden removal associated with the extension of the quarry cutting further to the W. Other features depicted on the 1st edition OS maps (1877/1885) are a two tier sinuous quarry face towards the W end of the quarry cutting along the N side, a linear ledge/terrace is shown extending SW-NE below the E end of the upper quarry face towards the major N tip. In addition two rectangular structures, one on the floor of the cutting placed a third of the way into the quarry from the E, and another slightly to the NE just N of the quarry cutting between tips; the former is considered to be a kiln, the latter a quarrymen's shelter. W of the large tip on the N side of the quarry is an irregular shaped pond (no leats are indicated).

The quarry appears to have been accessed at the E end of the quarry cutting by a SW-NE aligned incline, which originally extended as far as the tramroad spur within EA032A, linking it to Tramroad IWT014. The head of this incline retains its brake emplacement and pond, and associated brakeman's shelter. Immediately W is a wide level open area, which may have acted as a marshalling yard (with the site of a possible limekiln at its W end). To the W, the upper part of the quarry was accessed by a second narrow tramroad incline with a further brake emplacement site marked by low banks and holding down bolts. At this point an abutment marks a former high-level access from the workings of the main quarry face (S side of cutting) and the main waste tip to the N, with the route of the tramming lines visible on APs. The head of the Quarry at the W retains Fe rails (out of situ?). Evidence for water management in the quarry is in the form of leats/drains, scouring for removal of overburden/waste rock – possibly also as an aid to splitting stone from the face. In addition a major N-S aligned fault crosses the slope, just east of the main quarry faces, visible as a deep linear cutting.

Within the quarry cutting, the appearance of the north-facing quarry face with its associated triangular piles of waste at its foot suggests water may have been employed in the form of scouring; this is tentatively supported by a linear depression above the quarry face, which may be the remains of a leat. Centrally placed, at the base of the quarry face, on the south side of the upper tramroad are two parallel linear stone features, dumps of processed/graded stone were noted.

Two embayments form the western end or head of the quarry cutting, here at the foot of the south slope is a small stone-built structure, possibly a shelter or shooting butt. A curvilinear leat or drain running along the lip of the western and northern sides of the southern of the two embayments at the head of the cutting. This may have been used to drain the workings and/or the flush away waste. Depressions visible above the rock face and triangular piles of waste at its foot suggest that it may have been scoured.

In addition to a number of natural limestone sinkholes, shallow extractive diggings and small linear tips were noted in the area; examples located c.15m to the south of pond EA032.11, include a pit, c8m in diam., and another shallow shaft working, 1.5m by 2.1m, with spoil forming a bank around its circumference. Along the north side of the quarry cutting a series of small stepped platforms were noted terraced into the slope, above the site of what appears to be the remains of a lime kiln; their exact purpose is unknown (extractive scoops, working or processing platforms, or small 'collecting ponds?'). Also noted was a slope leading from the working face to the cutting floor set between two spoil heaps at the south side of the quarry cutting, this may represent a chute used to convey extracted stone away from the quarry face to the tramroad side.

The quarry and its features survive in relatively good condition for their class, especially the E brake engine emplacement, shelter and kiln. The brakeman's shelter has been demolished to just above ground level.

Apart from the quarry faces, and tips, there are numerous surviving features, the most significant including RCAHMW entries, are detailed below, where included descriptions of NMR sites augmented during the course of the current survey are given in italics:

EA032.04, archaeological significance: A?/B

Brake engine complex at head of incline EA032.05, associated with Quarry EA032B. The complex, 10.5m (E-W) comprises sunken sub-rectangular chamber, 3.5m (N-S) by 3.6m (E-W), with a narrow gap, 0.94m at its east side from where a linear cut, c.6.9m in length (2.3m wide at the top and 1.1m wide at the base) extends to the east. Two metal tie-rods (2.37m apart) are preserved *in situ* at the north and south sides of the sub-rectangular chamber, near its eastern side.

The sub-rectangular chamber is likely to have housed a horizontal brake wheel, the linear cut guiding the cable(s) towards the inclined plane. A piece of Fe metalwork lies 1.8m to the east of the end of the linear cut.

A leat, 0.6m, wide directed water from a sub-triangular pond (3m by 9m) to the north, to the west end of the linear cut. A further sunken reed-filled area, a possible subsidiary pond lies to the west of the previous pond.

The complex is surrounded by disturbed ground, and structure EA032.06, a possible brakeman's shelter, is located c5m to the south.

EA032.05, archaeological significance: A?/B

Incline, Penderyn-foel, the route of the incline is aligned approximately east-west (from SN9401208892 to SN9418209120); at its upper end within quarry EA032B is a brake engine emplacement, EA032.04. The incline is c2-3m in width and runs parallel with a gully/stream

which drains the quarry area. The line of the incline has been cut into the slope on the north side, with a bank c1.4m wide. The overall formation is c8m wide. At the base of the incline, the sides are slightly embanked, with stones visible in the surface, which may be a remnant of the original formation (at SN9413608949 (4.5m accuracy)). Approximately midway along the length of the incline, just above quarry EA032A, is a group of 4 vertical metal rods; 2 pairs set diagonally on either side of a narrow gully/drain at SN9412208934 (4.9m accuracy). Just upslope of this, the bank on the north side has been revetted. This feature may have acted to guide incline cables.

A tramway extended west of the brake engine emplacement EA034.04, into the quarry cutting, visible west of feature EA032.07 as a limestone-constructed bank, 2.5m wide, with a gully on either side extending the width to c.3.5m.

EA032.06, archaeological significance: A?/B

Brakeman's shelter, Penderyn-foel, a demolished rubble and stone-built rectangular structure, 4.5m (N-S) by 5m (E-W) bonded with a dark ashy mortar which contains flecks of lime; the line of the facing just visible in the demolition rubble. A small quantity of dark yellow ashy unfrogged brick was also found in the demolition material. There is a small drainage channel running into the natural stream. This is considered to be the shelter for the incline Brakeman; the feature is located 6m to the south of brake engine emplacement EA032.04.

EA032.07, archaeological significance: A?/B

Kiln, Penderyn-foel, survives as a large sub-rectangular revetted platform, 6.5m (N-S) and 5.5m (E-W) at the north end, and a slightly offset central chamber. Externally there are traces of stone revetting on the east, south and north sides, while on the west side 2-3 courses of revetting survive. The drystone walled chamber, 2.3m (E-W) by 1.8m (N-S), partly collapsed and filled with a limestone block tumble, is accessed on the west side, by a 1.3m wide gap, the former entrance itself appears to have been c0.1m wide. The chamber is arranged slightly off-centre with its east side slightly bowed. The feature is tentatively interpreted as a primitive limekiln.

There is a small rectangular pit to the northeast of the structure, which may have been a well and is now filled with large stones. There is also a further possible rectangular feature/structure to the east of the main structure, which is defined by low earth banks.

EA032.01, archaeological significance: B

Rectangular feature, Penderyn-foel, depicted on 1st edition OS map (1877), this is a well-constructed structure almost square in plan, rubble-built walls bonded with lime mortar with squared facing blocks on the exterior and interior faces. Bricks also noted in the interior – (unfrogged with very large quartz inclusions), the remains of a later phase? The west wall of the structure continues to the north with a series of possible platforms on the east side. The access to the interior of the structure is on the east side. The L-shaped bank on the south and west sides of the structure is 1.3m wide, 6.4m east-west and 7.8m north-south. There is a sunken linear feature, possibly a path, or drain, 0.15-0.2m deep and 0.6m wide to the front (east) of the structures.

EA032.08, archaeological significance: B/C

Parallel linear stone dumps, Penderyn-foel, 2 parallel linear stone dumps to either side of a spur which leads east from main track (former tramroad) along the base of the cutting of quarry EA032B. The stone included in these dumps is lighter in colour than that in the adjacent waste tips, and includes high quantities of quartz. The larger of the two dumps is c1.5m wide and c16m

in length extending further to the south than its partner, while the shorter one is c2m wide, up to c0.75m high and c14m in length. The stone dumps are c2m apart, with the tramroad spur running between them.

EA032.09, archaeological significance: B/C

Tramroad bridge abutment, Penderyn-foel, a revetted tramroad bridge abutment, 2.3m E-W by 1.4m wide, and 0.8m high, projects from the north side of the quarry cutting at EA032B, at the end of a small embayment. The revetting is 2-3 courses high, of roughly squared stone blocks.. The stonework has partially collapsed at the S end. The feature corresponds with a tramming line on the extensive tip to the N and would have formerly carried a tram bridge which would have provided access between the quarry face to the S and the tip.

EA032.10, archaeological significance: B/U

Rectangular Structure, Penderyn-foel, located on the south side of the line of the internal tramroad of Quarry EA032B. The feature, 3.2m north-south by 6.2m east-west, is defined by low footings of a single course on the north and west sides, the south side has been built into the slope of the quarry face, and the east side survives as a drystone wall, 0.6-1m wide and maximum c1m high, of 4-5 courses, faced with limestone rubble. There are two upright metal rails, protruding above ground surface by 0.3m and set diagonally from each other in the northwest and southeast corners of the structure. A drain running diagonally to the northeast from the structure across the line of the adjacent tramroad.

The exact purpose of the feature is unknown, however it is likely to be connected with the operation of the adjacent tramroad/incline.

Nprn 308305, archaeological significance: A

Penderyn Quarries: Moel Penderyn Quarry: "Limestone quarry on the north scarp of Moel Penderyn, covered an area approx 500m E-W x 350m" (RCAHMW; NMR; Coflein). *Same as EA032B.*

Table 57. Subsidiary point and polyline features within EA032B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.01	Rectangular feature, Penderyn-foel	SN9394308869	Structure
EA032.02	Rectangular feature, Penderyn-foel	SN9392208823	Structure
EA032.04	Brake engine emplacement, Incline EA032.05, Penderyn-foel	SN9404308876	Brake engine
EA032.05	Incline, Penderyn-foel	SN9410708924	Inclined plane
EA032.06	Brakeman's shelter, Penderyn-foel	SN9404708864	Structure
EA032.07	Kiln, Penderyn-foel	SN9396508855	Kiln
EA032.08	Parallel linear stone dumps, Penderyn-foel	SN9389608823	Spoil tip
EA032.09	Tipping Bay, Penderyn-foel	SN9387008828	Tipping bay
EA032.10	Rectangular Structure, Penderyn-foel	SN9386608823	Structure
EA032.11	Pond, Penderyn-foel	SN9385608890	Pond
EA032.12	Sunken trackway, Penderyn-foel	SN9402108980	Trackway

Table 58. NMR Registers within EA032B

Nprn	Name	NGR	Type
308305	PENDERYN QUARRIES: MOEL PENDERYN QUARRY	SN940089	QUARRY

Extractive landscape: Penderyn-foel Quarry Area: EA032C**EA032C Archaeological significance: B/C**

A small isolated bowl-shaped quarry scoop set within an area of natural sink holes, and cut into the west-facing slopes of Moel Penderyn (at SN9325208626), depicted on 1st edition OS map (1877). The quarry appears to be early in date and probably relates to quarrying of limestone for local construction/agriculture. The quarry face lies at the S and E sides of the scoop, and a narrow linear entrance cutting, c2.5m wide and up to 2m deep, extends to the W. A rubble mound lies at the mouth of the entrance. The associated tips (not shown) to N, W and SW. The field visit identified a small shelter/powder magazine set into the side of a tip just adjacent to the N side of the quarry entrance. The site survives in an undisturbed, though ruinous condition, further described as follows:

EA032.16, archaeological significance: B

Shelter or powder magazine, Penderyn-foel, a small barrel-vaulted stone-built structure, c2.5m east-west and c2m north-south, located at Quarry EA032C. It is open to the south and built into the north slope of the tip, just west of the quarry entrance cutting. Five or more courses of walling are visible in the interior, and the remnants for the spring of a barrel vault was noted. The entrance appears to have been on the east side, where there is a slight depression. This feature, obscured by a considerable amount of collapsed material, has been tentatively identified as a powder magazine, a robust quarry workers' shelter or possible blast-shelter. A small elliptical waste tip, c6m by c4m, lies to the west of the feature.

Table 59. Subsidiary point and polyline features within EA032C

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.16	Shelter or powder magazine, Penderyn-foel	SN9324508634	Quarry Shelter/Powder Magazine

Extractive landscape: Penderyn-foel Quarry Area: EA032D**EA032D Archaeological significance: A**

This extractive area (centred at SN9373609088) falls into two discrete areas, upper (W) and lower (E). The lower extractive area (depicted on the 1st edition OS) includes a SW-NE linear trench, c4m wide, cut into the slope, with a 3m high, S-facing quarry face, and spoil on the S side of the floor cutting. It is approached by a track (former tramroad) from the E. Slightly further to the N is another parallel linear cutting, marked on the 1st edition OS map (1877) as 'Old Quarry'; its head at the SW is crossed by the line of the main track/tramroad (EA032.28), running

between the entrance of the area at the SE and Quarry area EA032E to the W. The quarries in the area appear to represent exploitation of limestone outcropping.

The upper extractive area is not shown on either the 1st, 2nd or 3rd edition OS mapping or indeed earlier mapping, though features here appear of similar nature to those identified in area EA032B and EA032E, for instance, and look to be of at least late 19th / early 20th century date. The upper extractive area, itself comprises several large quarries cut into the N-facing slopes of Moel Penderyn, with a less intensively worked area above, consisting of smaller quarry scoops and pits, some of which are cut by a revetted quarry track c1m wide and leading from N to S. To the N is an area of small-scale quarry scoops and workings, the tips associated with which appear eroded, and which may be later. The main quarry comprises a series of at least three quarry embayments located S of the access track/tramroad which links to the incline, the largest, westernmost embayment forms a distinctive saucer shape; the entrance cutting is c1-2m deep and c3 wide at its base (it probably narrows further, but the base is obscured by vegetation). The entrance trackway to the quarry is slightly revetted, and starts at SN93726 09058 (9.6m). At the W end of the main quarry the remains of a dram (EA032.22) was found. At the upper quarries of the area, there are v-shaped areas of 'scree' or waste on the slopes, evidence for possible use of water to clear debris/waste.

The upper area of extractive activity is served by an incline (EA032.17), which extends SW-NE through the lower area, with a transfer stage, brake engine emplacement and associated brakeman's shelter at the incline head and an upper tramroad extending into the higher quarries. About half way along the incline's S side, just upslope and W of the previously mentioned lower linear extractive trench is a D-shaped quarry scoop, 5m by 4.7m, with stone blocks in the interior adjacent to the S side of the incline; its associated tip lies to the N of the incline, accessed by a short tramming route.

Dense vegetation mainly, bracken now covers much of the area, hampering survey work. The most significant of the surviving features in the area identified during the fieldwork are as follows:

EA032.17, archaeological significance: A?/B

Incline, Penderyn-foel, this feature runs roughly west-south-west - east-north-east to (between SN9367109044 and SN9393309209) from Quarry area EA032D and is divided into two sections, an upper and a lower, with a transferring point partway up (feature EA032.18) between the two sections.

The upper section of the incline has a single course of stone revetting on its north side, and also has several regularly spaced parallel spaces in its surface, indicating where the sleepers have been lifted.

The incline formation is 2.15m wide, with spread embankments to either side and a drain on the north side, 0.45m wide and 0.15m deep. Adjacent to and just south of the lower section of the incline is a semi-circular quarry scoop at SN9384409134; an associated bulbous linear tip lies opposite, north of the incline. Access to this quarry is provided via the incline itself.

At the base of the lower incline is a sunken rectangular area, c1.5m deep, with a sunken linear continuation to the west; this feature is considered to be the remains of the lower winding gear of

the incline and a tipping bay or transfer stage with the main Penderyn Quarry Tramroad. Five courses of drystone revetting survive on the south side of the interior of the sunken area, though the revetting is less defined on the north side. There is a bank on the north side, 1.5m wide, leading to the tipping bay end of the complex.

Downslope of the lower incline, out of situ on the opposite side of the tramroad, at SN9389109251 (2.5m accuracy) is a large Fe wheel, c1.5m in diameter, labelled "S976, R. White & Sons, Widness, Lancs.", with a central projecting groove 0.22m thick, thought to be part of the incline winding apparatus.

EA032.18, archaeological significance: A?/B

Brake Engine Emplacement, located at head of lower section of incline EA032.17; a sub-rectangular sunken area with 4 metal upright rods in the corners, square sections at the base, round sections towards the top, with screw tops. A curved metal brake pad, 1.53m in diam., survives in the sunken area, held in place by hexagonal bolts at either end, a further large Fe upright rod on the north side. The north and south tie rods/bolts are 2.23m apart, while the east-west bolts on the north side are 2.15m apart, and those on the south side are 2.23m apart. The interior of the brake chamber is revetted (two courses visible). To the E is a stone-faced sunken linear area with parallel linear channels running along it, which would have housed and guided cables. The entire feature, from the uprights at the west end of the sub-rectangular cut to the end of the linear depression is 11.6m in length, with the parallel channels terminating at 10.5m. The external width of the linear depression is c.3.5m; the edges are c1.1m from the centres of the channels. The AP mapping indicates this feature lies at SN9377409099, which is given above rather than the location given by the Garmin 76 GPS reading, which reads SN9379909102 (Accuracy 4.6m).

EA032.21, archaeological significance: A?/B

Brakeman's shelter, Penderyn-foel, a stone-built 2-cell structure, which is located to the southeast of the brake engine emplacement EA032.18, and just west of a largely tumbled drystone wall/bank, aligned NNW-SSE, which divides the open mountain proper from the enclosed slopes to the east (Garmin 76 GPS reading SN9380109094, 6.2m accuracy).

The structure, 6.8m north-south (spread by 1m tumble) and 4.2m east-west (spread by c1m tumble) set on a slight terraced platform, has two internal compartment with a central dividing east-west wall, with each compartment having a separate access to the east. No internal access between the two rooms was visible. The walls are between 0.8-1m in width and survive to c0.5m in height, and are constructed of random rubble (traces of a very crumbly lime mortar remain), mainly limestone and conglomerate and a mixture of quarried stone and field clearance. A few unfroged bricks, and clay pantiles were noted amongst the demolition rubble.

Though the interior is obscured by demolition material, the southern of the two rooms appears to have been approximately 2.8m north-south.

The structure was probably the shelter for the brakeman operating the adjacent incline; the brake emplacement lies some 22m to the northwest.

There is a small heather-covered mound of spoil 1.3m to the south-east, 2-3m long, and the adjacent to the east of the structure is a tumbled stone field boundary (the main boundary

between the enclosed land and the open mountain shown on the Tithe and the OS 1st edition and subsequent maps).

An embanked trackway (embankment 1-1.5m high) to the west runs above the structure from the quarry the southwest to the incline (EA032.17). A rectilinear terraced area lies to the north of the structure, 10m in length north-south, with a slight bank on the east side.

EA032.19, archaeological significance: B/C

Tramroad branch, Penderyn-foel a tramroad branch running to the northwest upslope from the main Penderyn line. The formation, c1.15m wide, is slightly embanked, with a drain either side, c0.15m deep and c0.4m wide. A stone rubble bank (c1.5-2m wide) follows the route of the tramroad on its north side to the quarry face.

This curving tramroad branch leads on a generally E-W heading (between SN9385009144 and SN9394809173) from tramroad EA032.28, curving around the SW end of a linear quarry cutting (c.43.5m in length) with its associated structure EA032.20, to the area of the large semi-circular quarry scoop at SN9384409134, which lies just south of the line of incline EA032.17.

EA032.20, archaeological significance: B/C

Structure, Penderyn-foel, possibly a shelter, 4.9m north-south and 5m east-west (externally), c.2.7m east-west internally, of elongated sub-rectangular plan with a sunken interior, defined by stone banks surviving to c1m in height (on the downslope side). This structure sits at the foot of the southeast-facing quarry face (c.43.5m in length NE-SW). Nearby to the southwest of the site is a further possible small structure marked by a tree and a straight line of boulders c3.5m long (running southwest-northeast). There are indications of a track (tramroad EA032.19) running between this and the former structure.

EA032.26, archaeological significance: B/U

Hut Structure, Penderyn-foel, a small sub-rectangular single cell structure, c7m east-west by c7m north-south, located immediately east and downslope of the modern Penderyn Quarry track. The feature is defined by a scarped hood cut into the slope at the north end, and otherwise heavily overgrown banks, with stone tumble (unfrogged brick was noted in the vicinity), the entrance appears to have been to the south. Given its location, the structure is probably the remains of a quarry worker's hut.

There is a large stone dump forming an embankment to the north side of the structure, and remains of walling to the southeast. Lengths of Fe rails (0.12m thick) were noted adjacent to the west and south walls.

EA032.27, archaeological significance: B/U

Possible incline extension, Penderyn-foel, located to the north of EA032.17, the feature is 0.8m high and 2m wide, with 5-6 courses of revetting, and a ditch on the south side. This revetted linear feature is visible on aerial photographs, though not on historic mapping, continuing from at junction with EA032.28 at SN9381509192 to head ENE to SN9387109233. The feature is considered to be an extension of the incline from quarry area EA032E.

Table 60. Subsidiary point and polyline features within EA032D

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.17	Incline, Penderyn-foel	SN9376609091	Inclined Plane
EA032.18	Brake Engine Emplacement	SN9377409099	Brake Engine Emplacement
EA032.19	Tramroad branch, Penderyn-foel	SN9391509154	Tramroad
EA032.20	Structure, Area D Penderyn-foel	SN9391009166	Structure
EA032.21	2-Cell Structure, Area D Penderyn-foel	SN9379909089	Structure
EA032.22	Truck, in Quarry Embayment, Area D Penderyn-foel	SN9369509032	Truck
EA032.25	Possible kiln, Penderyn-foel	SN9392309215	Lime kiln
EA032.26	Hut Structure, Penderyn-foel	SN9397009202	Structure
EA032.27	Possible incline extension, Penderyn-foel	SN9384309213	Inclined plane?
EA032.28	Tramroad, Penderyn-foel	SN9415609038	Tramroad

Extractive landscape: Penderyn-foel Quarry Area: EA032E**EA032E Archaeological significance: B/C**

The 1st edition OS depicts rough ground (Furze) in the area (at SN9370809095) and a track/tramroad (EA032.28) entering the area from EA032D to the E on an E-W alignment, which extended as far as the main NNW-SSE boundary (tumbled dry-stone bank/wall). This feature is not shown extending further until the 2nd edition OS (1904), when it crosses the boundary to access a small linear SW-NE aligned quarry (not previously shown) on the steep NW-facing slopes of Moel Penderyn, at the SE edge of the area. The main quarry face extends SW-NE, where it turns NW. The only tip is located at the NE edge of the quarry; this also extended to the NW from the track/tramroad's (EA032.28) entry point into the quarry. By the 3rd edition OS map (1918), and indeed the 4th edition OS (1953) no change is recorded apart from the fact that the quarry is recorded as 'old'.

The field visit identified a series of relatively small linear quarry cuttings (including that shown on the 2nd edition OS), which perhaps represent the latest phase of workings on Moel Penderyn. The formation of tramroad (EA032.28) was noted to survive, running partway up the slope, above the present-day track which skirts the N edge of the area. A length of exposed drystone revetting, 2.7m in length and c0.45m high, was noted on the downslope side of the tramroad formation at SN9363209094 (6.2m accuracy), this was associated with surviving tramroad bridge abutments EA032.24 to the east. At the far western end of the area is a quarry with revetted sides, and opposite the sunken entrances to the quarry (SN9357809075 (6.9m accuracy)) are the remains of stone-built lime-bonded linear revetting, c1-2m and 5-6 courses high. This appears to be the remains of a single tipping bay; two discrete areas of revetted stonework are visible, as the central part of the feature has collapsed. Immediately NW of the quarry adjacent to the track is a small length of bank with exposed revetting on the N side. Small tips were noted downslope of the track, with linear tips extending N and E of the modern track (which may also be a former tramroad). The lower slopes, in particular the area to the NE, which is heavily disturbed and partially infilled; appears to have been worked at a later date, and is likely to

represent the final phases in quarrying activity in the Moel Penderyn area. The previously mentioned modern track contours the base of the mountain slope on the N side of the area, and appears to have been recently reinstated at its E end where it cuts through a quarried area; the area of significant disturbance.

The RCAHMW entry for this site is detailed below (description augmented during the course of the current survey in italics):

Nprn 308306, archaeological significance: B/C

Penderyn Quarries: Moel Penderyn North Quarry: “Limestone quarry covered an area approx 500m E-W x 250m; remains of former tramroad” (RCAHMW; NMR; Coflein). *Same as EA032E, see above.*

Table 61. Subsidiary point and polyline features within EA032E

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA032.23	Shelter, Penderyn-foel	SN9374009128	Structure
EA032.24	Abutments, Penderyn-foel	SN9368609112	Bridge abutments
EA032.28	Tramroad, Penderyn-foel	SN9415609038	Tramroad

Table 62. NMR Registers within EA032E

Nprn	Name	NGR	Type
308306	PENDERYN QUARRIES: MOEL PENDERYN NORTH QUARRY	SN937091	QUARRY

Old Quarries, east of Pontbren Llwyd (see figure 26)

Extractive landscape: Old Quarries, east of Pontbren Llwyd: EA035

EA035 Archaeological significance: C/D

Two small tramroad side quarries located adjacent to Mr Glover's Railroad (at SN9526208012), both marked as 'Old' on the 1st edition OS (1885). Both probably relate to local construction and the adjacent tramroad.

Both features survive: that to the north is a linear hollow, now partly hidden by young trees, with stone debris, and small tips located W and downslope of the railroad; that to the S is L-shaped, in part following the line of a stream gully, mature trees are a notable feature of the quarry sides. The most significant of the quarries to survive is that to the south, detailed below:

EA035.02, archaeological significance: B/C

Old Quarry, SE of Pontbren Llwyd, an 'Old Quarry' depicted on 1st edition OS maps (1885), east of a tramroad ('Mr Glover's Railroad' IWT014), approached by revetted track alongside stream within quarried stream gully, 32m (SW-NE). Rectilinear quarry cutting, c.40m (NW-SE) by 16m (SW-NE) survives with moss-covered stone debris and mature trees growing from quarry faces visible in the interior. The feature is on a small scale and probably relates to Tramroad construction.

Table 63. Subsidiary point and polyline features within EA035

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA035.01	Old Quarry, E of Pontbren Llwyd	SN9524207993	Quarry
EA035.02	Old Quarry, SE of Pontbren Llwyd	SN9530007848	Quarry

Part 2. The Eastern Valley Extractive Areas

Varteg-hill Colliery & Craig-ddu Quarry: EA082 (see figure 28)

This extensive and disparate extractive area has been broken down into the following constituent sub-areas:

Extractive landscape: Varteg-hill Colliery: EA082.01

EA082.01 Archaeological significance: U/D

Varteg-hill Colliery (EA082.01 and Nprn 33584), located at SO2447906160, is depicted on the 1st edition OS map (1880). The NMR description gives: '*Varteg Hill Colliery (West) was opened in 1860; it lies some 1.7km to the west of Varteg Hill Colliery (East) (nprn 260007)*'. The OS 1st edition map shows the site then consisted of a series of buildings including coke ovens, a level, and a tramroad system. The associated tips were located to the south of the colliery. The area has now been largely cleared, surviving remains include a linear concrete structure at the site of the coke ovens depicted on the 1st edition OS map (EA082.10), and the adjacent tramroad. There has been later tipping over much of the area.

A surviving linear spoil tip (EA082.26), c.2.3m high, lies at the eastern approach to Varteg-hill Colliery; this feature is first depicted on the 2nd edition OS map, but is associated with a railway spur already in place on the 1st edition OS map (1880). The most significant of the surviving features include the following:

EA082.29 Header Pond, Varteg-hill Colliery Archaeological significance: B/C

A rectangular header pond (at SO2452606296), depicted on the 1st edition OS map (1880). The partially drained pond, 24m N-S by 16m E-W is stone-lined and defined by stone rubble and earth banks, c.1.45m wide at the top. The building material appears to be largely field clearance material, including gritstone. There is a possible access leat on the north side, near the west corner, which corresponds with a leat depicted on the 1st edition OS map. There is also a further linear bank and channel feature at the northeast edge, with stone and earth banks, which are 0.75m wide and 1m high; this embanked feature runs 4m NE from the pond where it steps to the E, and then continues to a total length of 12m. The N end of the pond is now occupied by a platform, 7.5m N-S and 13m E-W, of concrete with part masonry edging; the base of a later temporary structure.

EA082.28 Engine House, Varteg-hill Colliery Archaeological significance: B

A partly-demolished stone-built engine house (at SO2439806255) with yellow brick details to openings and a mono-pitch roof. In the partly demolished south-facing elevation are two glazed arched windows, and the springing for a further arched opening. The east-facing elevation has 4 arched openings, that to the south over an arched doorway, and the two to the north having a later outshut built across them. Metal glazing bars to arched openings. The eastern side of the building, ie. the main part which would have housed the beam engine, has been demolished. The Engine House is first depicted on the 2nd edition OS map (1901).

EA082.25 Colliery Row, Varteg-hill Colliery Archaeological significance: A/B

A row of early workers' housing, 'Colliery Row' (at SO2447106326), depicted and named on the 1st edition OS map (1880) just to the north of Varteg-hill Colliery. The site comprises the remains of an isolated row of 4 small cottages (one-up/one-down?), 38.5m (max) E-W by 4.8m

(single width) wide. The cottage at the west end of the row is slightly larger with a rear extension, 3.5m E-W by 3m N-S. Associated to the north is an area of terraced curvilinear enclosures/gardens upslope to the north. Whilst the cottages have been demolished, the lower parts of the front walls survive to around 1m in height, and the layout of the site as shown on the 1st edition, including small front yards, remains easily traceable on the ground. The associated enclosures to the rear of the row survive; the drystone boundaries (up to 1m high) extending north from the cottages, and the remains of other ancillary structures (including a small L-shaped building to the northeast) were also noted. Fe pipes, part of a drainage system, were noted to protrude from the outer eastern boundary of the enclosure. The remains are grassed-over and in a stable condition and there is no visible evidence of recent disturbance or erosion.

Table 64. Subsidiary point, polygon and polyline features within EA082.01

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA082.09	Level, Varteg Hill Colliery	SO2447306188	Level
EA082.10	Coke Ovens, Varteg-hill Colliery	SO2455306206	Coke Ovens
EA082.11	Rectangular building, Varteg-hill Colliery	SO2440106192	Building
EA082.12	Large building, Varteg-hill Colliery	SO2445606214	Building
EA082.13	Rectangular building, Varteg-hill Colliery	SO2441006215	Building
EA082.14	Structure over tramroad, Varteg-hill Colliery	SO2443006229	Structure
EA082.15	Small rectangular building, Varteg-hill Colliery	SO2443306219	Building
EA082.16	Rectangular feature, Varteg-hill Colliery	SO2440406229	Feature
EA082.17	Small rectangular feature, Varteg-hill Colliery	SO2443206214	Feature
EA082.18	Circular feature, Varteg-hill Colliery	SO2446506222	Feature
EA082.19	Small rectangular feature at end of tramroad track	SO2443906217	Feature
EA082.20	Small rectangular feature at end of tramroad track	SO2442706216	Feature
EA082.22	Rectangular feature, Varteg-hill Colliery	SO2445306161	Feature
EA082.25	Colliery Row, Varteg-hill Colliery	SO2447106326	Workers Housing
EA082.06	Tramroad serving level EA082.09	SO2452006166	Tramway
EA082.07	Tramroad system, Varteg-hill Colliery	SO2444406238	Tramway
EA082.21	Small rectangular feature adjacent to coke ovens, Varteg-hill Colliery	SO2451506216	Feature
EA082.26	Spoil tip, Varteg-hill Colliery	SO246960621	Spoil Tip
EA082.29	Header Pond, Varteg-hill Colliery	SO2452606296	Reservoir
EA082.27	Redbrick Building, Varteg-hill Colliery	SO2444006251	Building
EA082.28	Engine House, Varteg-hill Colliery	SO2439806255	Engine House

Table 65. NMR Registers within EA082.01

Nprn	Name	NGR	Type
33584	VARTEG HILL COLLIERY	SO244062	COAL MINE

Extractive landscape: Craig-ddu Quarry: EA082.04

EA082.04 Archaeological significance: A/B

Craig-ddu Quarry comprises a large quarry located northwest of the Varteg-hill Colliery site depicted on the 1st edition OS map (1880) with working faces along the east and west sides, with the tips lying mainly downslope to the south. The quarry survives in good condition, and appears little changed since the survey of the 1st edition OS map; the main alterations include the removal of the crane (EA082.23), and infilling of an old level (EA082.24) at its southern edge.

On the east side of the quarry, there is a major north-south aligned quarry cutting with a substantial quarry basin at its northern end. The access to the latter is via a narrow cutting the lower sides of which are reinforced by lengths of drystone revetting. This sunken linear access lies between a linear N-S aligned tip (to the west) and the upper eastern quarry face. Adjacent to the eastern side of the quarry access cutting is a small rectangular structure (EA082.34) first shown on the 2nd edition OS map, probably a quarry workers' shelter. Other features in the area include a sub-rectangular shelter or shooting butt (EA082.32) and nearby a recently constructed short length of E-W aligned drystone walling.

The west side of the quarry consists of a series of embayments and scoops, with a narrow revetted track running in front of them. In addition to the main north-south aligned quarry cutting a similar arrangement of smaller embayments was also noted on the eastern side, extending south of the main quarry cutting. This quarry appears to have been exploiting a small natural stream valley, digging out to either side and back into the slope, with the tipping in the middle of the worked area, covering the earlier workings. At the south end of the west side of the quarry, to the south of the access ramp which leads into the quarry from the slope above, is a slight pit, c.4m in diameter, with spoil around the edge. The southern end of this quarry is cut by field boundary walls, the southern extent of the tips lying within enclosed land; tow cast-iron boundary markers were noted defining the eastern edge of the quarry. At the north end of the quarry, just north of the track, a ditch runs down the slope into the head of the quarry cutting from the west, this drainage ditch, shown on the 1st edition OS map, may have been exploited for scouring. At the north end of the quarry, there are a series of small spoil tips which cut across the valley floor, leaving a small gap for drainage. The northernmost of these may have acted as a dam, c.1m high forming an amorphous linear bank, across the natural stream gully. The overall condition of the quarry is generally good; the features are well-preserved and the tips heather-covered, though some minor disturbance was noted. The main features identified are described as follows:

EA082.34 Structure, Craig-ddu Quarry Archaeological significance: B/C

A rectangular drystone structure (at SO2405406545), 4.04m in length north-south and 3.03m east-west to the back wall, which is built into the slope and is revetted with thin slabs, standing 1.14m high. It is built into the slope on the east side. There is an opening 1.03m wide, in the west elevation, which is partially blocked on its north side, leaving a gap of 0.45m. The walls are c. .49m thick. The interior of the structure is full of tumble, and there is a patch of exposed debris to the north. This structure, not depicted on the 1st edition OS map, but shown on the 2nd edition (1901), is likely to be a quarry workers' shelter.

EA082.32 Sub-rectangular shelter, Craig-ddu Quarry Archaeological significance: B/C

A small sub-rectangular shelter (SO2404506571), possibly a shooting butt. The feature is 2.1m east-west, and 2.4m north-south, of roughly coursed drystone construction, with up to 7 rough

courses, c.0.72m in height. The interior is sunken. The south wall is 0.5m wide. There is a revetted bank 1.5m further south, with the revetting partially collapsed.

Table 66. Subsidiary point, polygon and polyline features within EA082.04

Feature Number (see gazetteer for further details)	Name	NG R	Type
EA082.23	Crane, Craig-ddu Quarry	SO0403606572	Crane
EA082.35	Revetting, Craig-ddu Quarry	SO2407106562	Revetment
EA082.34	Structure, Craig-ddu Quarry	SO2405406545	Structure
EA082.32	Sub-rectangular shelter, Craig-ddu Quarry	SO2404506571	Structure
EA082.24	Old Level, Craig-ddu Quarry	SO2399306405	Level
EA082.08	Trackway, Craig-ddu Quarry	SO2403706587	Trackway
EA082.33	Revetted trackway, Craig-ddu Quarry	SO2403206567	Trackway
EA082.36	Upper trackway, Varteg Hill	SO2492306450	Trackway
EA082.05	Old Quarry, Blaen-ffrwd (outlying quarry E of Craig-ddu Quarry)	SO2368306487	Quarry

Extractive landscape: Patchworkings and tips, Varteg Hill: EA082.30

EA082.30 Archaeological significance: A/B

An area of patch workings comprising shallow quarry embayments and associated shale tips, with areas of exposed shale waste, located on the edge of the stream valley north of the smallholding of Blaen-melyn. The area is shown as an 'Old Quarry' on the 1st edition OS map (1880), north of and adjacent to the trackway (part of EA082.08) serving Craig-ddu Quarry.

The area is well-grassed over, with considerable heather growth on the tips. There is a series of four small quarry embayments connected by the sinuous, slightly hollow trackway, which is 0.5m deep and 1m across, with stone revetting 0.6m high and with indications of piled waste at its side. There are small areas of small fine shale waste, which may have been washed down from the quarry faces. At the northeast side of the tips are the remains of a quarry worker's hut (EA082.37) with an associated bank, noted on aerial photographs (not depicted on 1st edition OS map).

Table 67. Subsidiary point and polyline features within EA082.30

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA082.31	Shelter/shooting butt, Varteg Hill	SO2418906706	Structure
EA082.37	Quarry Workers' Hut, Varteg Hill	SO2423006722	Hut

Varteg Hill Extractive Area: EA093 (see figures 29 and 30)

Extractive landscape: Varteg Waste: EA093A (see figure 29)

EA093A Archaeological significance: B-D

At the east of the area is a relatively large and complex area of mine workings (EA093.05) of the Varteg-hill Colliery (East), opened in 1860 by John Vipond. Varteg-hill Colliery is depicted on the 1st edition OS map (1882), shown including several buildings, a shaft (ironstone), a tip to the east of the colliery with a system of lateral tipping lines off a central tramming line. A tramway is shown serving the Varteg-hill Colliery and another colliery to the west also known as Varteg-hill Colliery. This tramway is identified on the 2nd edition OS map as the Varteg Hill Colliery Branch line of the LNWR (EA093.37 and Nprn 67694); this was built to link with the LNWR Abersychan Extension, built in 1877, near Blaenavon High Level Station. Whilst much of the area has been remodelled by later mining activity and subsequently partially cleared, surviving remains include:

EA093.127 Building, Varteg-hill Colliery Archaeological significance: B/C

A length of walling of shuttered concrete construction (EA093.127 and Nprn 67710 and 67711); this site comprises an L-shaped concrete structure set into the slope, with a SW-NE aligned wall c.8m and an adjoining wall, 3.25m in length at right angles. The walling survives to a height of c.3.3m and is 0.47m thick. There is a small rectangular opening with an iron bar sill in the long wall near the angle with the shorter wall. There is a level area, 10-15m in extent, to the east of the structure. A building platform, c.5m NW-SE and c.9m NE-SW, of 3 course rubble stone and brick wall 0.35m high, was noted to the northeast. Cartographic evidence indicates this building complex is the result of a reconstruction of an earlier structure shown on the 1st edition OS map carried out between the surveys of the 1st edition OS map (1882) and 2nd edition map (1901), suggesting the surviving remains are of late 19th century date. To the east of this structure, adjacent to the track (former LNWR branch) is:

EA093. 55 Shaft, Varteg Hill Colliery Archaeological significance: B/C

A closely set pair of backfilled rectangular stone-lined shafts, each c.2m east-west by 1.5m north-south, at the site of a shaft identified on the 1st edition OS. There are two further capped shafts at the north of the area (not depicted on the 1st edition OS map).

EA093.124 Varteg Incline Archaeological significance: A/B-D

Near the northern boundary of the area is the Varteg Incline; built in 1861 to take coal from Varteg-hill Colliery down to Cwmavon on the Monmouthshire Railway & Canal Company line, the incline *'ran due east down the valley side for some 760m. It was superseded when the London & North Western Railway's Varteg Hill Colliery Branch was opened. The upper end of the incline, where an engine house was situated, has been lost beneath later tipping. The surviving upper end is 210m long west of the B4246 road and this section is embanked up to 6m high and the track bed is 5m wide. To the east of the B4246 it continues in a cutting for 80m to the bridge (nprn 67683) over the London & North Western Railway's Abersychan Extension. Further downhill it is embanked for 40m then lies in a cutting for some 70m. At the foot the tracks branched north and south to join the Monmouthshire Railway and in the triangle so formed, a large stone structure with a vaulted brick roof was constructed in line with the incline tracks as a covered catch pit. It lies at grid reference SO 26920 06410. The (catchpit) structure is not shown on the first edition Ordnance Survey 25in map of 1882 but appears on subsequent*

editions' (NMR: RCAHMW 2009). The field visit confirmed the remains of the Varteg Incline are as described by the RCAHMW. Modern post & wire boundaries have been established along the length of the surviving upper end, and recent drainage works appears to have potentially damaged the northern side of the feature as it approaches the B4246.

To the south of extractive area EA093A is a further extensive area of associated workings and tips (EA093.22) depicted on the 1st edition OS map (1880/1882) extending south of Varteg-hill Colliery (East) to just beyond the site of Bracy's Pit (Coal Disused) with its shaft and pithead structures, and beyond to the isolated Row of Upper Five Houses(EA093.71). The north of the area has been partially tipped over by the large coal washery tip EA093.21, the bare black slopes of which now provide a dominant visual element in the landscape. The latter is shown in its early stages on the 2nd edition OS map (1901) with its washing machine (EA093.134) and tramming line, the 3rd edition map (1920), depicts the tip more or less at its full extent; an aqueduct now carrying a leat from the washing machine. The coal washing machine (EA093.134) appears to have been constructed on the site of an earlier Mine kiln (EA093.58) depicted on the 1st edition OS map (1882); the remains of masonry associated with either the coal washing machine or more likely the adjacent abutment carrying the tramming line to the washery tip were noted during the current survey. The NMR records the site as '*...a pair of 'mine kilns', which could have been built earlier by the Varteg Iron Co.*' and identifies the coal washery site as the remains '*of a calcining kiln in a steep bank on the E side of the LNWR branch railway (nprn 67694). Part of a coursed rubble wall survives 3m high, with 3 associated holding down bolts. (R Hayman, Hayman & Horton, 9/1/2003)*'.

EA093.71 Upper Five Houses Archaeological significance: A?/B

Of the area's surviving above ground features the site of Upper Five Houses (EA093.71), a row of four or five terraced colliers' houses with associated yards depicted on the 1st edition OS map (1882), is perhaps the best preserved. The remains currently comprise three terraced areas with areas of surviving revetting and walling. The houses appear to have been located either on the upper terrace, or middle (sloping) terrace, the lower terraced area is the remains of 4 N-S aligned yards, a further yard area to the west contains other structural remains (see entry in gazetteer for further details). Though the standing buildings have been demolished, the terraced site is grassed-over and in a stable condition.

Table 68. Subsidiary point, polygon, and polyline features within EA093A

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA093.04	Tips, Mine Slope, Varteg	SO2626606545	Tips
EA093.05	Varteg-hill Colliery	SO2616106286	Colliery
EA093.06	Small crescent-shaped quarry, Varteg Hill	SO2624906374	Quarry
EA093.07	Small tip, Varteg Hill	SO2630006068	Spoil tip
EA093.08	Small tip?, Varteg Hill	SO2623706076	Spoil tip
EA093.09	Small quarry, Varteg Hill	SO2621705966	Quarry
EA093.10	Small quarry, Varteg Hill, site of	SO2609505927	Quarry
EA093.11	Small quarry, Varteg Hill	SO2636305976	Extractive pit, tip
EA093.12	Small tips, Varteg Hill	SO2632505895	Spoil tip

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Feature Number (see gazetteer for further details)	Name	NGR	Type
EA093.13	Small quarry, Varteg Hill	SO2608705823	Quarry
EA093.14	Small quarry, Varteg Hill	SO2645805909	Extractive Pit
EA093.15	Small quarry, Varteg Hill	SO2644305823	Quarry
EA093.16	Small quarry, Varteg Hill	SO2634005769	Quarry
EA093.17	Small quarry, Varteg Hill	SO2632905677	Quarry
EA093.18	Tips, Varteg Hill	SO2619705694	Spoil tip
EA093.19	Tip, Varteg Hill	SO2607905573	Spoil tip
EA093.20	Small quarry, Varteg Hill	SO2601605527	Quarry
EA093.21	Washery Tips, Varteg Hill	SO2605005960	Spoil tip
EA093.22	Large area of workings, Varteg Hill, partly tipped over	SO2569505735	Extractive pit
EA093.36	Trackway network, Varteg Hill	SO2601405729	Trackway
EA093.37	Tramway and sidings, Varteg Hill	SO2614106374	Tramway
EA093.48	Small rectangular feature, Varteg Hill Colliery	SO2618206420	Feature
EA093.49	Long narrow rectangular building, Varteg Hill Colliery	SO2620406373	Building
EA093.50	Large rectangular building, Varteg Hill Colliery	SO2616906363	Building
EA093.51	Large L-shaped building, Varteg Hill Colliery	SO2615106318	Building
EA093.52	Small rectangular tramroad feature, Varteg Hill Colliery	SO2612306304	Feature
EA093.53	Small rectangular trackside feature, Varteg Hill Colliery	SO2612406277	Feature
EA093.54	Small rectangular feature, Varteg Hill Colliery	SO2612506232	Feature
EA093.55	Small rectangular feature, labelled shaft on 1st ed OS, Varteg Hill Colliery	SO2610506204	Mine Shaft?
EA093.56	Irregular-shaped feature, Varteg Hill Colliery	SO2611306221	Building?
EA093.57	Square building, Varteg Hill Colliery	SO2613006410	Building
EA093.58	Mine kilns, Varteg Hill Colliery	SO2604606061	Kilns
EA093.59	Trackside feature, Varteg Hill Colliery	SO2602106038	Feature
EA093.60	Trackside feature, Varteg Hill Colliery	SO2601906024	Feature
EA093.61	Trackside feature, Varteg Hill Colliery	SO2601905994	Feature
EA093.62	Coal Level, Varteg Hill Colliery	SO2598905956	Level
EA093.63	Old Level, Varteg Hill Colliery	SO2598105943	Level
EA093.64	Air Shaft, Varteg Hill Colliery	SO2596105952	Ventilation Shaft
EA093.65	Large pithead building, Bracy's Pit	SO2590605844	Building
EA093.66	Shafts, Bracy's Pit	SO2593705854	Shafts
EA093.67	Unnamed farmstead, site of	SO2616605960	Farmstead
EA093.68	Four Houses, site of	SO2621405821	Terraced housing
EA093.69	Unnamed building, site of	SO2624605834	House
EA093.70	Stable Houses, site of	SO2636405849	Terraced Housing
EA093.71	Upper Five Houses	SO2579205741	Terraced

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Feature Number (see gazetteer for further details)	Name	NGR	Type
			housing
EA093.72	L-shaped feature, Varteg Hill	SO2636405886	Feature
EA093.73	Domestic building, Mount Pleasant	SO2560505698	House
EA093.74	Domestic building, Mount Pleasant	SO2563905713	House
EA093.75	Air Shafts, Mount Pleasant	SO2550705656	Ventilation Shafts
EA093.76	Farm Buildings? Varteg Hill	SO2602105362	Building
EA093.124	Varteg Incline	SO2632706413	Inclined Plane
EA093.126	Building, Varteg-hill Colliery	SO2606806181	Building
EA093.127	Building, Varteg-hill Colliery	SO2606906210	Building
EA093.128	Two ponds, Varteg-hill Colliery	SO2605106223	Reservoir
EA093.129	Building, Varteg-hill Colliery	SO2609306256	Building
EA093.130	Cluster of small rectangular features, Varteg-hill Colliery	SO2608706276	Feature
EA093.131	Mineral Railway, Varteg Hill	SO2604105621	Railway
EA093.132	Culvert, Varteg Hill	SO2613405636	Culvert
EA093.133	Drainage Gully, Varteg Hill	SO2601405729	Drainage Ditch
EA093.134	Washing Machine (remains of), Varteg-hill Colliery	SO2604906067	Coal Washing Machine

Table 69. NMR Registers within EA093A

Nprn	Name	NGR	Type
67697	VARTEG HILL COLLIERY, CALCINING KILNS	SO26040606	CALCINING KILN
67699	VARTEG HILL, SPOIL TIP II	SO26160617	SPOIL HEAP
67700	VARTEG HILL, SPOIL TIP III	SO26250605	SPOIL HEAP
67701	VARTEG HILL, SPOIL TIP IV	SO26300613	SPOIL HEAP
67702	VARTEG HILL, SPOIL TIP V	SO26330593	SPOIL HEAP
67703	STABLE HOUSES, VARTEG	SO26360585	TERRACED HOUSING
67706	VARTEG HILL COLLIERY RAILWAY INCLINE	SO26400642	INCLINED PLANE
67707	VARTEG HILL, SPOIL TIP VI	SO26330636	SPOIL HEAP
67708	VARTEG HILL, SPOIL TIP VII	SO26200633	SPOIL HEAP
67709	CWM GLO DRIFT MINE, VARTEG	SO2618706345	DRIFT MINE
67710	VARTEG HILL COLLIERY, UNIDENTIFIED BUILDING I	SO26080621	COLLIERY
67711	VARTEG HILL COLLIERY, UNIDENTIFIED BUILDING II	SO26090623	COLLIERY
67714	STABLE HOUSES, GARDENS	SO26380586	GARDEN
67717	VARTEG HILL, MINE SLOPE BRANCH RAILWAY	SO26050621	RAILWAY
67718	VARTEG HILL, RAILWAY	SO26220600	TRACKWAY
67719	VARTEG, ENCLOSURE III	SO26230589	FIELD
67721	VARTEG, UNIDENTIFIED BUILDING II	SO26300600	BUILDING

Nprn	Name	NGR	Type
67722	VARTEG HILL COLLIERY, RAILWAY SIDING	SO26070616	RAILWAY
67723	CWM GLO DRIFT MINE ACCESS ROAD	SO26130645	ROAD
67749	BRYNAVALON, VARTEG	SO26180604	HOUSE
260007	VARTEG HILL MINEWORKINGS	SO261063	COAL WORKINGS
400398	VARTEG WASTE, RELICT INDUSTRIAL FEATURES	SO25880557	EARTHWORK

Table 70. HER Registers within EA093A

Prn	Name	NGR	Type
09108g	Mount Pleasant	SO2564805716	House

Extractive landscape: Gallowsgreen and Waun-Hoskin: EA093B (see figure 30)**EA093B Archaeological significance: B-C**

A small area of lobed spoil tips (EA093.01 and Nprn 67676) depicted on the 1st edition OS map (1882). NMR description gives ‘*On the lower slopes of Mynydd Varteg Fach, N of Varteg Reservoir. An undulating spoil tip from small C19 quarrying, encroached on W side by large area of late C20 regrading. Mainly rubble covered with grass and heather, covering an area 60m N-S by 30m (R Hayman, Hayman & Horton, 8/1/2003)*’. The fragmentary remains of the site comprise surviving tips at the east, the area of quarrying has been truncated by the opencasting, and the west part has been destroyed. A small shelter (EA093.135) set into the east face of the tip was noted during fieldwork. There is a drainage ditch to the east of the area, depicted on the 1st edition OS map, 3m wide at the top and 1.75m wide at the base, 1m deep. This has a U-shaped profile with slightly splayed sides, embanked on both sides, though the details are obscured by sedge grass and reeds. This is linked by a side spur to the ditch adjacent to EA093.02. The latter is a small feature depicted on the 1st edition OS map (1882), confirmed to be a small low linear spoil tip, 17m long from end to base, and 6m wide maximum. It is adjacent to a curvilinear drain/stream which cuts the back end of the tip. This drain is c.1m deep and c.1.1m at its base, though it varies, and narrows to a drain c.1.5m to the north of the tip. The tip is stable, well-grassed over, with some heather.

Quarry (EA093.03 and Nprn 67677) comprises a linear quarry depicted on the 1st edition OS map (1882) contouring the hillside immediately above and west of the road (B4246) between Blaenavon and Varteg, its tips extending downslope to the road edge. The NMR description gives ‘*On the lower slopes of Mynydd Varteg Fach, W of the B4246. Late C19 quarry shown on the 1st ed OS. Shallow quarry covering a wide area approximately 220m NW-SE by 50m. A bedrock face 2-3m high can be followed, but not continuously, across the W face, at right angles to which are several later exposed faces at lower level. Spoil mounds are well grassed over (R Hayman, Hayman & Horton, 8/1/2003)*’. The working face runs along the southwest side of the area, and faces eastnortheast. The main quarry comprises a long, but not continuous, upper face, with a series of small scoops, cuttings and benches extending below to the east. The whole area is well-covered by grass and bracken with no erosion. The associated spoil has been tipped in small heaps downslope and in front of the main face and benches. The benches are in c.1.5m-3m steps. There is a shallow ephemeral quarry scoop to the south of the main quarry area. The surface geology of the area is Pennant Grit, which confirms this quarry as a sandstone quarry, possibly for building stone/road

construction (especially considering its proximity to the road). There is no evidence of ironstone or shale waste, which would suggest it is directly related to ironworking.

To the south of this quarry near the Late 19th century reservoir built by Pontypool Gas & Water Co (first shown on 2nd edition OS map (Nprn 67674)) is a possible prehistoric field boundary or enclosure, consisting of low ephemeral stone banks defining an oval area obscured by bracken; an upright Fe post was noted in the south bank stamped with the letters "PO".

Table 71. Subsidiary point, polygon, and polyline features within EA093B

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA093.02	Tip, Gallowsgreen	SO2623506968	Spoil tip
EA093.38	Trackway network	SO2624907064	Trackway
EA093.39	Trackway serving quarry, Waun-Hoskin	SO2629607141	Trackway
EA093.135	Shelter, Gallowsgreen	SO2623306865	Structure

Table 72. NMR Registers within EA093B

Nprn	Name	NGR	Type
67674	VARTEG RESERVOIR	SO26300682	RESERVOIR
67675	VARTEG RESERVOIR, IRON POST	SO26260686	BOUNDARY POST
67676	MYNYDD VARTEG FACH, SPOIL TIP	SO26220690	SPOIL HEAP
67677	MYNYDD VARTEG FACH, QUARRY	SO26270718	QUARRY

Lasgarn Wood: Nant-y-mailor Quarry: EA099 (see figure 31)**Extractive landscape: Nant-y-mailor Quarry: EA099****EA099 Archaeological significance: B**

The main part of this area is taken by the disused workings in Cwm Lasgarn of a limestone quarry (EA099.01), shown as "Old" on the 1st edition OS map (1882), which provided limestone for flux at the British Ironworks. The associated Abersychan Limestone Railway (Nprn 407507; SAM GM597) known to have been in existence by 1830, is thought to date to date from c. 1826 and to have been in operation supplying limestone to the British by 1827, when the furnaces there first came into blast (Van Laun 2001, 40-45). The Trevethin Tithe map of 1843 shows a slightly smaller 'Stone Quarry' than current, then under the ownership and occupation of Capel Hanbury Leigh, Esq of Pontypool Park. By the closure of the quarry, as depicted on the 1st edition OS map, the quarry had slightly expanded to the south and north, formerly rough pasture (again part of Capel Hanbury Leigh's estate).

Aerial photographs show a spread of linear spoil tips, radiating in fan-tip fashion from a point at the north of the quarry. A stone-lined culvert, or Level portal (EA099.05), the southern of two such features in the quarry, was noted, along with an area of revetting along the northern entrance to the quarry. It should be noted that severe winter weather considerably hampered the walk-over survey; at the time of the field visit much of the area was masked by a blanket of snow; and it is considered likely that other surviving remains may survive in the area. In addition to the Abersychan Limestone Railway (Nprn 407507; SAM GM597), which provided access to the quarry at the lower western edge of the quarry a more recent paved track gives access at a higher level to the interior of the quarry from the south; this feature is not shown on the 1st, 2nd or 3rd edition maps and is considered to be a relatively recent addition. The surviving extractive remains noted in the area are of average condition; significance is enhanced by group value with the now scheduled Abersychan Limestone Railway (SAM GM597).

Two linear trackside quarries, EA099.06 and EA099.07, considered to relate to the construction of Limestone Railway were also recorded during the field visit.

Table 73. Subsidiary point and polygon features within EA099

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA099.01	Old Limestone Quarry, Cwm Lascarn	SO2819704576	Quarry
EA099.02	Trackway, Old Quarry, Cwm Lascarn	SO2816204567	Trackway
EA099.03	Rectangular feature, Old Quarry, Cwm Lascarn	SO2809904517	Feature
EA099.04	Stone-lined feature Cwm Lasgarn	SO2820204581	Feature
EA099.05	Level portal/culvert, Cwm Lasgarn	SO2816704521	Level?
EA099.06	Linear Quarry, Cwm Lasgarn	SO2784904481	Quarry
EA099.07	Rectangular Quarry, Cwm Lasgarn	SO2771004413	Quarry

Table 74. NMR Registers within EA099

Nprn	Name	NGR	Type
407507	ABERSYCHAN LIMESTONE RAILWAY	SO2811504520	RAILWAY

Table 75. HER Registers within EA099

Prn	Name	NGR	Type
07224g	SITE NAME NOT KNOWN	SO2822704669	Quarry
07225g	SITE NAME NOT KNOWN	SO2810404521	Building

Table 76. Cadw Registers adjacent to EA099

SAM No/LB No	Name	NGR	Type	Status
GM597	Abersychan Limestone Railway	SO274042	Railway	SAM

Lasgarn Wood: Cwrt-yr-eos Quarry: EA110 (see figure 31)**Extractive landscape: Cwrt-yr-eos Quarry: EA110****EA110 Archaeological significance: B-C**

This area comprises a series of at least 10 quarries with a minor outlier to the north along the route of the Abersychan Limestone Railway (Nprn 407507; SAM GM597) at Cwrt-yr-eos; these quarries include 7 large linear and curvilinear quarry cuttings cut into the hillside on the upslope side of the Railway. Above the main quarry cuttings, there appears to be a series of secondary scoops cut into the higher slope, these are now largely obscured by dense forestry plantation. The tips, largely on the downslope side of the Limestone Railway, are generally short and stubby in profile. The upper surface of these tips are generally raised above the level of the adjacent Limestone Railway indicating overbridges or elevated barrow runs/tipping lines formerly allowed access from the quarries to the tips. The plan of the Abersychan estate of the British Iron Co., surveyed in 1825-6 by R.C. Taylor names a Limestone Quarry located within a narrow parcel of land ('Llasgarn') identified as belonging to the British Iron Company; this quarry, located at the head of the Tal-y-wain incline (which later gave access to the Abersychan Limestone Railway), can be associated with the quarries EA110.10 and EA110.11, identified during fieldwork. The quarries to the east (EA110.01 to EA110.09) appear to represent expansion of limestone extraction into an area owned and occupied by Capel Hanbury Leigh, Esq; this is supported by the Tithe Map and schedule of Trevithin of 1843. It is, however, considered likely that these later quarries also directly supplied the British Iron Company.

The northern-most of the main group of quarries at Cwrt-yr-eos is a deep quarry (EA0110.01 and 07227g; partly scheduled under GM597) located at SO2746803842. This quarry is the only quarry of the group depicted on the 1st OS map (1880), and later editions, where it is labelled as an "Old Quarry". An embanked access (?) track leads south off the line of the Limestone Railway to the northern edge of another deep sub-rectangular quarry (EA0110.03) immediately west of the track.

The general area is under dense forestry, despite recent felling operations, the area remains largely inaccessible due to bracken and dense bramble undergrowth. The majority of the remains

appear to survive in average condition; a limited amount of damage from forestry operations was visible. The significance value of the quarry workings in this area is enhanced by association with the now scheduled Abersychan Limestone Railway (GM597), the scheduled area of which clips the edge of several of the workings.

Table 77. Subsidiary point and polygon features within EA110

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA110.01	Old Quarry, Cwrt-yr-eos	SO2746803842	Quarry
EA110.02	Quarry Scoop, Cwrt-yr-eos	SO2744103965	Quarry
EA110.03	Workings, Cwrt-yr-eos	SO2741303808	Quarry
EA110.04	Quarry scoop, Cwrt-yr-eos	SO2736703782	Quarry
EA110.05	Quarry, Cwrt-yr-eos	SO2734103671	Quarry
EA110.06	Curvilinear quarry scoop, Cwrt-yr-eos	SO2733103647	Quarry
EA110.07	Quarry scoop, Cwrt-yr-eos	SO2732603599	Quarry
EA110.08	Quarry Scoop, Cwrt-yr-eos	SO2732603533	Quarry
EA110.09	Quarrying, Cwrt-yr-eos	SO2732303480	Quarry
EA110.10	Rectangular Quarry, Cwrt-yr-eos	SO2731703413	Quarry
EA110.11	Linear quarry scoop, Cwrt-yr-eos	SO2731503366	Quarry

Table 78. HER Registers within EA110

Prn	Name	NGR	Type
07227g	SITE NAME NOT KNOWN	SO2746703838	Quarry

Table 79. Cadw Registers adjacent to EA110

SAM No/LB No	Name	NGR	Type	Status
GM597	Abersychan Limestone Railway	SO274042	Railway	SAM

British Ironworks Extractive Area: EA112 (see figure 32)

Extractive landscape: Pant-glas Slip: EA112.02

EA112.02 Archaeological significance: A/B

An area of workings to the southeast of Cwmybyrgwm Colliery (now Scheduled Ancient Monument MM163), depicted and labelled "Pant-glas Slip" (EA112.02) on the 1st edition OS map (1880). The Tithe map of 1843 indicates the area in fact formed part of the holdings of the Pentwyn and Golynos Iron Co., rather than part of the lands held by the nearby British Ironworks.

The area contains extensive areas of boulder field and scree slopes, which have been exploited. Near the steep bare slopes of the Cwmybyrgwm Colliery tips, at the north of the Pant-glas slip area are a series of workings at different levels. A lower area with a WNW-ESE aligned linear quarry cutting ending in a large quarry basin with internal debris and linear tips extending along the eastern edge of the access cutting. There are a series of small quarry scoops in a very heavily bracken-covered area in the vicinity of the large linear quarry cutting. The entrance to linear quarry is revetted at SO2552003050 (4.8m accuracy). Above to the west of the lower quarry, with steep slope/slide between is a second higher placed quarry scoop cut into the steep mountain side, with piles of associated waste stone to the north. A large boulder gully or chute was identified to the north of the latter, with a further high level quarry or area of scree above. The workings in the area appear to relate to stone extraction for building purposes. Some of areas of scree may in fact be quarry waste or even stone stockpiles.

The southern area of Pant-glas slip contains at least three primitive linear quarry cuttings; these features are relatively narrow and stepped into the slope, typical features include revetted entrances/side walls. The easternmost of these quarries, at SO2549303066 (4.7m accuracy), is perhaps the best example. At the south of the area is a linear quarry, at SO2555503011 (4.8m accuracy), with tipping downslope to the east of the entrance located at the brake of slope and rough revetting, 0.6m high, on both sides of the entrance cutting; this quarry contains a number of large cracked boulders *in situ* and associated small conical waste heaps – this may be evidence of stone/boulder splitting possibly using fire-setting. At the far south of the area is a steep stream gully; just north of the gully two shooting stations were located overlooking a small pond to the east.

EA112.48 Quarry Workers' Hut, Pant-glas Slip Archaeological significance: A/B

A rectangular hut at SO2547803088, main axis westnorthwest-eastsoutheast, with small square annexe at the east end of its south wall, depicted on the 1st edition OS map (1880), located immediately adjacent to and west of a trackway spur leading to an area of quarry workings to the south. The remains comprise a hut, c.12.5m by c.5m., represented by a rectangular depression defined by substantial banks with traces of stone facing. The annexe at the southeast survives as an area of debris and tumble, and may represent an annexe. The main building measures c.2.75m wide internally, while the main bank at the east end is spread with a triangular profile, c.1m high, and c.4m wide at the base. The side banks are 1m wide, scarped into the slope below the track on the west side. There is no visible entrance. There is also a small spoil heap to the east.

This site which was considered to be a possible quarry workers' hut has the appearance of an upland 'Hafod type' dwelling, however, cartographic evidence indicates the site could be that of

a former cottage/homestead shown on the Trevithin Tithe map of 1843, recorded as ‘Homestead’ owned and occupied by the Pentwyn and Golynos Iron Co (No. 1249 in the apportionment). The 1st edition OS and the Tithe map show two structures at the location, the larger to the west and a smaller to the east. The Tithe map depicts a N-S track running between the two structures, and shows the immediately associated irregular field system; by the survey of the 1st edition OS the latter has been lost to extractive activity in the vicinity of the structures/huts, though survives in a fragmentary state further east.

Table 80. Subsidiary point and polyline features within EA112.02

Feature Number (see gazetteer for further details)	Name	NGR	Type
EA112.48	Quarry Workers’ Hut, Pant-glas Slip	SO2547803088	Hut
EA112.91	Pond, Pant-glas Slip	SO2543903135	Pond
EA112.17	Trackway network, Pant-glas Slip	SO2542003176	Trackway
EA112.02	Quarry, Pant-glas Slip	SO2521303135	Quarry

Table 81. NMR Registers adjacent to EA112.02

Nprn	Name	NGR	Type
85072	CWMBYRGWM COLLIERY, ABERSYCHAN;CWM-BYRGWM COLLIERY	SO25130332	COAL MINE
85073	CWMBYRGWM COLLIERY: CHIMNEY	SO24970336	CHIMNEY
85074	CWMBYRGWM COLLIERY: SHAFT	SO25050339	MINE SHAFT
85075	CWMBYRGWM COLLIERY: WATER BALANCE	SO25210326	MINE SHAFT

Table 82. HER Registers adjacent to EA112.02

Prn	Name	NGR	Type
02156g	CWMBYRGWM COLLIERY	SO25210326	Colliery
03187g	SITE NAME NOT KNOWN	SO24980335	Chimney

Table 83. Cadw Registers adjacent to EA112.02

SAM No/LB No	Name	NGR	Type	Status
MM163	Cwmbrygwm Colliery	SO252033	Coal Mine	SAM

6.2 *Water Management Features Visited During Year 6 Fieldwork*

The Hirwaun Cynon Valley Water Management Systems (See figures 33a-36)

Of the 85 water management features associated with IW024 Hirwaun, IW025 Llwydcoed, IW026 Gadlys, and IW027 Abernant ironworks, identified from a rapid survey of the first edition OS maps carried out during Year 5, a total of 18 were reservoirs or ‘ponds’, the remainder leats and feeders, with the exception of two water pipes linking to the Aberdare Canal, the Aberdare Canal itself, and eight watercourses, utilised and possibly enhanced for the supply of water to the ironworks and associated workings.

Historically, the water management system of the area depended largely on the watercourses of the Cynon River and its tributaries. In addition the large reservoirs of Hirwaun Pond and New Pond, located immediately to the west of Hirwaun and fed by Nant-yr-Ochain, and other smaller reservoirs to the north of the works, together with other watercourses and leats, supplied IW024 Hirwaun ironworks. South of Hirwaun and at Gamlyn weirs channeled water from the Afon Cynon via feeders controlled by sluices and to the works at Llwydcoed, IW025, with sparse use of holding reservoirs.

The Ironworks of Abernant (IW027) was supplied via a series of small reservoirs to the east of the core area, fed by leats and the watercourse of Nant-y-wenallt, which linked into an extensive area of drainage on the south-west facing slopes of Mynydd Aberdare; the latter have been dealt with in this report as part of the relevant extractive area. Part of the system was Forge Pond, which supplied the adjacent Abernant Forge and Mills. The water course/leat to the southeast, which supplied the reservoir, was fed from a small system (surviving), which supplied the nearby Wyrfa (Werfa) Colliery. The same water course/leat was tapped by two water pipes linked to the Aberdare Canal; this appears to have formed part of an integrated water management system. The site of the old Abernant Forge is currently under housing, whilst the site of the associated reservoir is buried and partly taken by school playing fields and part of Aberdare Golf Club.

The Ironworks of Gadlys, IW026, appears to have been fed directly via weirs from the Cynon and Dare Rivers, though a system of leats and small reservoirs formerly extended over Aberdare Common, and possibly up the Dare Valley. This area of complex drainage appears to be part of a more extensive drainage area extending down the western side of the valley from Nant-y-Cnapau near Hirwaun in the north to Gadlys in the south. This area appears to relate primarily to colliery sites, though could at least in part form an integrated ironworks and colliery supply system. For this reason the main extent of this area has been indicated and awaits further detailed investigation, as necessary. That part of the area adjacent to Gadlys Ironworks has seen extensive remodelling during the 20th century, and little appears to have survived of the associated water management features on the ground. The system may possibly have included the now altered ‘fish ponds’ of Aberdare Park.

Examination of aerial photographs and modern mapping indicated that the connection of the system to the ironwork core areas might survive largely intact, at least for IW024, IW025, and IW026. Few of the former reservoirs now survive, however this system appears to have largely depended on the Afon Cynon for direct supply, with water storage capacity almost exclusively provided by the large reservoirs of Hirwaun and New Pond; the site of these has been largely buried by waste from nearby Tower Colliery. The reservoirs at Blaen-nant appear to have had a dual purpose of supplying both the water management system associated with Abernant

Ironworks, and also the needs of local extraction (eg. Blaen-nant Balance Pit and Werfa Colliery). Elsewhere the few small reservoirs that survive, such as on Mynydd Cefn-y-gyngon and at Fothergill's Patches, are considered to be associated with coal and iron ore workings, rather than ironworks supply.

During Year 6, elements of four sub-systems associated with the above ironworks were visited; the sub-systems associated with IW024 Hirwaun, IW025 Llwydcoed, IW026 Gadlys are dealt with further in this section, those associated with Abernant, ie the reservoirs at Blaen-nant are dealt with under the relevant extractive landscape section in the report to avoid repetition.

Hirwaun water management sub-system (see figure 34)

Archaeological significance: A-C

The main surviving feature within the Hirwaun sub-system is a major feeder channel (IWW016), which runs between SN9540106120 and SN9579406548. This feature, the main feeder for the Hirwaun Ironworks, survives as a partially dry leat within a strip of mature woodland, its course is preserved as a boundary on modern maps, and is first shown on a map of 1760, 'an exact plan of Hirwaun Furnace,' and later detailed on the 1st edition OS map and shown taking water from weir (IWW034) on River Cynon at SN9538406548, at its southern extent it fed into a reservoir (IWW017), located immediately north of Hirwaun Ironworks site and now infilled.. The leat, c.2.75m in width and an overall depth of c0.7m, is formed on the downhill (south) side by a flat-topped earth and stone embankment, between 1.5m and 2m wide, and varying between 0.5-2m in height, in places substantial and constructed of loose rounded boulders. There is a short break in the feature at SN9569706215, and another break further west. Near the feeder channels southern end at SN9577606226 is a revetted overflow/spillway (IWW933), which allowed water to flow into the northwest side of the natural stream channel IWW018. The stone-built outlet, detailed on the 1st edition OS map as a sub-rectangular feature on the southeast side of IWW016, is 3.15m wide and c0.5m deep, and of random rubble construction with lime mortar bonding. It is considered likely that this feature is of 18th century date and contemporary with the feeder. The associated weir (IWW034) and sluice (IWW036), depicted on 1st edition OS map just north of a fording point on River Cynon, were not accessible, due to the high river water conditions experienced during the survey.

The other major features in the area are the reservoirs of Hirwaun Pond (IWW001), at SN9477606056, and New Pond (IWW004), centred on SN9489205799, located just west of Hirwaun. A map of Hirwaun Common (Tredegar Estate) dating from 1858, shows Hirwaun Pond largely as depicted on the 1st Ed OS maps of 1877/1885; a slightly irregularly shaped reservoir with a short embankment at its eastern and southern sides, its northern side is bordered by the railway embankment of the combined lines of the Aberdare Rhondda Railway, and the GWR (Vale of Neath Section). Within the reservoir are three small islands, the easternmost of which had a small rectangular structure (shooting hide?) at its southeast tip. The 1st edition OS map also depicts New Pond (IWW004), which lies immediately south and adjacent to Hirwaun Pond, centred on SN9489205799, an almost rectangular reservoir, enclosed on three sides by a substantial embankment (to the north, east and south), shown to have an internal face of sloping masonry. Today the reservoirs have been largely infilled by waste material from Tower Colliery; the eastern embankment of Hirwaun Pond and the eastern and southern embankments of New Pond survive on the eastern edge of the tipped area, now in an overgrown state. A number of leats associated with Hirwaun Pond (IWW002, IWW005, IWW935) were identified from the historic mapping, none were found to survive in their original form. Likewise the

majority of the sluices (IWW007, IWW035) and leats associated with New Pond, identified from historic mapping, no longer survive in the vicinity of the reservoir in their original, with the possible exception of IWW935. It was not possible to access the area of the outflows of the reservoirs at the time of the survey.

In addition to the main features, a number of minor leats/streams draining the workings on Hirwaun Common were identified and visited, most were found to survive in poor condition, these have been dealt with as part of the extractive landscape areas, and details are provided in the gazetteer.

Table 80. Visited features in Hirwaun sub-system

Numbers (see gazetteer for further details)	Name	Type	NGR
IWW001	Hirwaun Pond	Reservoir	SN9477606056
IWW002	Feeder leat Hirwaun Pond	Leat	SN9413706068
IWW004	New Pond Hirwaun	Reservoir	SN9489205799
IWW005	Leat for Hirwaun Pond	Leat	SN9393705647
IWW006	Nant y Cnapiau	Stream	SN9410404608
IWW007	Leat and Sluice for New Pond	Sluice	SN9470405425
IWW008	New Pond Leat	Leat	SN9491405630
IWW011	Feeder leat for New Pond	Leat	SN9419905737
IWW016	Feeder, North of Hirwaun Ironworks	Leat	SN9556906278
IWW018	Canalised stream, North of Hirwaun Ironworks	Stream /Leat	SN9561206153
IWW034	Weir, Hirwaun Ironworks Feeder	Weir	SN9538406548
IWW035	Sluice at New Pond, Hirwaun	Sluice	SN9491405692
IWW036	Sluice, Hirwaun Ironworks Feeder	Sluice	SN9539906544
IWW926	Leat draining workings, Hirwaun Common	Leat	SN9438004478
IWW927	Leat draining Gorllwyn Level	Leat	SN9434504547
IWW928	Stream/leat draining hillside of Hirwaun Common	Leat	SN9391204652
IWW929	Leat, Tower Craig Level	Leat	SN9358004687
IWW930	Stream, Tower Craig Level	Stream	SN9359304556
IWW931	Leat, Tower Craig Level	Leat	SN9352304473
IWW932	Leat draining workings, Hirwaun Common	Leat	SN9345904693
IWW933	Revetted overflow/spillway, Hirwaun Ironworks Feeder	Leat	SN9577606226
IWW935	Outflow leat of reservoir IWW001	Leat	SN9503705916

Llwydcoed (Aberdare) water management sub-system (see figure 35)

Archaeological significance: A/B

The main surviving feature within the Llwydcoed sub-system are the impressive remains of the main Feeder Channel for Llwydcoed Ironworks (IWW046), which runs east-west approximately parallel to the course of the Afon Cynon between SN9723904490 and SN9932305178, and originally fed a small pond and sluice just northeast of the Llwydcoed (Aberdare) blast furnaces. The feature, depicted on the 2nd OS Surveyors' drawings of 1814, is named on the 1st edition OS map as 'the feeder', and is likely to date to c. 1800, the founding date of the associated ironworks. It survives as a largely dry channel, c3.5m wide maximum, slightly cut into the slope, though this varies. There is a substantial flat topped embankment on the downslope (south) side c2m wide at the top and spread to c3m. The remnants of tumbled revetting on the exterior side of this bank, consisting of three courses of rough boulder stone, standing to c0.75m high, were noted, just west of the mineral line, near Lon Las, Llwydcoed. The top of the bank has a level metalled surface, and may have had the dual function of packhorse/tramroad as well as embankment. Both the leat and bank become more heavily vegetated towards the western end, mature trees indicate the early origins of the feature. A further surviving section of the leat is traceable for approximately 150m to the southeast of sluice IWW048 as it approaches the ironworks site.

A number of features, again identified as associated with the main feeder on the 1st edition OS map, were noted to survive; these include the weir and sluice (IWW031) at SN9724505164 between the inlet and overflow channels is revetted on the north side, with four courses of drystone water worn boulders, standing to c0.5m high. The probable site of the sluice is just downstream of the outlet channel, controlling the flow of water into the feeder. The masonry abutments, 3.55m in height, of an aqueduct (IWW032) depicted on 1st edition OS map carrying feeder channel IWW046 across Nant Hir at SN9805905069 on its route to Llwydcoed Ironworks were recorded; this structure has been altered (with block) to carry a footbridge.

A number of sluices depicted on the 1st edition OS map (1886/1890), were found to survive in association with feeder IWW046: these include a sluice (IWW048) to the northeast side the channel at SN9895704872, this appears to have provided an overflow to a stone-built arched culvert, c1.5m wide and a minimum 1m in height, which lead to a natural stream to the east of Llwydcoed farm. The sluice chamber narrows at the entrance to the culvert, which is constructed of roughly dressed stone blocks and has a length of rusted metal pipe on the southwest side of the interior, though this is partly obscured by debris, and vegetation. Further west on the south side of the feeder leat at SN9857804883, a sluice IWW925, allowed water to flow south towards leat IWW049, perhaps acting as an overflow. The upper stones of a segmental headed arched culvert (between 1.75 and 2m wide max) belonging to the sluice is just visible set into the embankment of the feeder channel bank.

A leat, IWW058 (SN9840104855 - SN9858304904), depicted on 1st edition OS map connecting the upper Llwydcoed feeder (IWW046) to the lower Llwydcoed feeder (IWW049) survives as a minor heavily eroded feature, within a generally damp/'flooded' area of woodland. Aerial photographs show the lower of the Llwydcoed feeders (SN9838404507-SN9922704924) from the River Cynon, also survives, retaining its channel and embankment. At the time of the survey the lower feeder, including its weir (IWW085) at SN9837904918, visible on aerial photographs, the adjacent sluice (IWW084), at SN9838604923, and the site of the aqueduct (IWW086) at SN9883804736 within the grounds of a modern villa style property, was largely inaccessible; the

remains visible east of the minor road to Glan-yr-Afon, and the adjacent railway line were considered to be less well-preserved than those associated with the upper feeder, though further visits would be required to fully evaluate exactly what survives.

Table 81. Visited features within the Llwydcoed (Aberdare) sub-system

Numbers (see gazetteer for further details)	Name	Type	NGR
IWW031	Weir and sluice, Upper Feeder, Llwydcoed Ironworks	Weir	SN9724505164
IWW032	Aqueduct, Upper Feeder, Llwydcoed Ironworks	Aqueduct	SN9805905069
IWW046	Upper Feeder Channel, Llwydcoed Ironworks	Feeder	SN9723904490
IWW048	Sluice, Upper Feeder, Llwydcoed	Sluice	SN9895704872
IWW049	Lower Feeder Channel, Llwydcoed Ironworks	Feeder	SN9838404507
IWW058	Leat, Llwydcoed Ironworks	Leat	SN9840104855
IWW084	Sluice, Lower Feeder, Llwydcoed Ironworks	Sluice	SN9838604923
IWW085	Weir, Lower Feeder, Llwydcoed Ironworks	Weir	SN9837904918
IWW086	Aqueduct, site of, Lower Feeder, Llwydcoed Ironworks	Aqueduct	SN9883804736
IWW925	Sluice, Upper Feeder, Llwydcoed Ironworks	Sluice	SN9857804883

Gadlys water management sub-system (see figure 36)

Archaeological significance: D/U

The Feeder Channel (IWW057) for Gadlys Ironworks depicted on the 1st edition OS map (1868) running between SN9973403105 and SO0000303614, then described as 'Gadly's Feeder', lies within an area partly obscured by dense vegetation. The feature appears to have been infilled, its site replaced by a recent footpath, for most of its length, its associated weir (IWW090) at SN9973503620, disturbed and removed by road bridge construction, during the latter part of the 20th century. A small portion of the former Outlet Leat (IWW059) associated with Gadlys also detailed on the 1st edition OS map, and which formerly extended between SO0020402790 and SO0039502917 survives at its northwest end, the feature is now largely in an infilled/buried state, its route lost to encroachment and subsumed under the extended back gardens to the rear of Gloucester Street, Maes-y-dre.

Table 82. Visited features within the Gadlys sub-system

Numbers (see gazetteer for further details)	Name	Type	NGR
IWW057	Feeder Channel for Gadlys Ironworks	Feeder	SN9973403105
IWW059	Outlet Leat, Gadlys Ironworks	Leat	SO0020402790
IWW090	Weir, Gadlys Feeder, Gadlys Ironworks	Weir	SN9973503620

Eastern Valley (Cwm Sychan and Cwm Ffrwd)

The water management system associated with Varteg, Golynos, the British, and Pentwyn appears to have been of relatively small-scale draining the Cwm Sychan and Cwm Ffrwd tributary valleys and exploiting the natural drainage along the southeastern flanks of Mynydd Varteg fach and Waun-wen, via weirs and a number of small reservoirs, most of which appear to have been formed by damming the fast flowing mountain streams (ie natural tributary water courses) of the area. A small area of drainage to the south of the core ironworks area of the British Ironworks is considered more likely to relate to the adjacent Cwmbyrgwm Colliery, rather than the nearby adjacent British Ironworks.

Of the 46 interests¹⁶ identified for this system during Year 3 of the project, 20 (or so) are either reservoirs or ponds, of these only two appear to survive intact, with a further 11 reservoirs/ponds, which potentially survives. Of the 15 stretches of leat two have been identified as surviving, with six other potentially surviving. The Year 6 study identified a further group of leats at Pant Glas with 4 additional small ponds, two of which survive, one in a modified form.

The year 3 study based on desktop studies alone (through comparing modern mapping and aerial photographic material with the original resource) indicated that the surviving water management system in this area appeared to be largely fragmented, with connections to the core areas largely lost. It should be noted that permission to access the area of the British Ironworks was not granted at the time of the current survey and for this reason no further detailed work was undertaken on the water management system of the Eastern Valley, beyond recording a few minor features encountered within visited extraction areas. Given time and weather constraints and due to its the extremely remote position in Cwmsychan, it was not possible to visit the main surviving water management feature associated with the British Ironworks, reservoir IWW570 (SO2424204117), with its impressive surviving stone-built dam and overflow.

¹⁶ Note: this total includes features other than leats, ponds and reservoirs, ie 2 streams.

7 Conclusions and Recommendations

The extraction sub-areas, extraction features, and water management features were assessed for condition and archaeological significance, and recommendations made. The details of the condition of the 622 extraction areas and individually recorded features or groups of features visited during year 6 were assessed with 20 extractive areas and sites found to be intact and well-preserved (ie condition A), 6 areas well-preserved, though obscured by vegetation, or accessibility (ie condition A/U) with a further 98 considered to be relatively well-preserved (condition A/B) for their type and class, with 6 areas/features showing a range of condition from A-D. Some 83 sites/areas were recorded as being in good condition (ie condition value B) with a further 41 at B/C and B-C, 10 at B/D and B-D (ie features/areas displaying a range of condition between moderately intact and substantially damaged), three at B/E and B-E (ie relatively well-preserved though partly in an altered state), and 48 at B/U. The remainder of the visited interests, apart from 148 interests of unknown surviving potential (through being obscured by vegetation, snow, later tipping, misplaced, or in areas inaccessible to the field visit) were assessed as being in a damaged, substantially damaged or altered state, or combinations thereof. Of the 622 interests noted in the year 6 study area, 130 features/areas, that is 20.9% of the resource, was considered to be at least in part well-preserved for their type and class, with 185 features/areas, ie 29.74% surviving in good condition, at least in part.

Of the 36 water management features visited and assessed in the western area 6 (16.67% of the assessed resource) were assessed as being relatively intact and well-preserved (condition A/B), and 14 (ie 38.89%) assessed as being moderately intact and in good condition (condition value B), with one at B/U, and another B/D. The remainder of the visited water management features, apart from 6 of unknown surviving potential, not examined due to problems of access, and or visibility, were assessed as being in a damaged, substantially damaged or altered state.

Table 83. Summary of assessment of archaeological significance: extractive features/areas

Archaeological Significance value	Number of extractive areas/features
A or A?	7
A/B or A?/B	50
A/U or A?/U	2
A/D or A-D	4
B	23
B/C	76
B/U	15
B/D or B-D	3
C	96
C/D, D/C or C-D	42
C/U	30
D	68
U/D or D/U	58
U	146
Non-archaeological features	2

The archaeological significance of extraction areas and features and the water management sub-systems was assessed on the basis of condition and the other criteria set out in section 4.2, above.

Archaeological significance is summarised in tables 83 and 84. Some 63 features/areas, ie 10.13% of the resource examined, were considered to be potentially of national significance, whilst 117 features/areas, ie.18.81% of the resource were considered to be of regional significance, the remainder being of local, minor or unestablished significance.

Full details can be found in the individual entries contained in Appendix 1 and II. The review of significance of water management features was undertaken across the sub-systems as a whole, as group value was an overriding consideration, the value of the whole ‘sub-system’ being of more value than the sum of the individual elements within.

Table 84. Summary of assessment of archaeological significance: water management sub-systems¹⁷

Archaeological significance value	Number of water management sub-systems and features
A?/B or A/B	7
B	3
B/C	1
B/U	3
C	8
D	3
D/U	5
U	6

The most significant extractive areas and features, and water management ‘sub-systems’ are summarised in tables 85 and 86, below:

Table 85. Significant extractive areas and features (sorted by significance values A-B)

Extractive Area/Feature No.	Name	Significance value
EA032A	Penderyn-foel	A
EA032B	Penderyn-foel	A
EA032D	Penderyn-foel	A
EA099.03	Rectangular feature, Old Quarry, Cwm Lascarn	A
EA099.06	Linear Quarry, Cwm Lascarn	A
EA099.07	Rectangular Quarry, Cwm Lascarn	A
308305	Penderyn Quarries: Moel Penderyn Quarry	A
EA001F	Bryn Defaid and Llwydcoed: Fothergill's Patches (east), Carn-y-frwydr	A/B
EA003	Blaennant (Ffynnon Lassa)	A/B
EA005A	Hirwaun Common, East: Mynydd Cefn-y-gyngon	A/B
EA010.24	Level Fach	A/B
EA010C	Gadlys Extractive Area: Level Fach	A/B
EA011	Blaengwawr Quarry	A/B
EA027A	Hirwaun Common, West: Twyn Canwyllyr	A/B

¹⁷ Western area only.

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EA082.04	Craig-ddu Quarry	A/B
EA082.25	Colliery Row, Varteg-hill Colliery	A/B
EA082.30	Patchworkings and tips, Varteg Hill	A/B
EA099.05	Level portal/culvert, Cwm Lasgarn	A/B
EA110.02	Quarry Scoop, Cwrt-yr-eos	A/B
EA110.03	Workings, Cwrt-yr-eos	A/B
EA110.04	Quarry scoop, Cwrt-yr-eos	A/B
EA112.02	Quarry, Pant-glas Slip	A/B
EA112.48	Quarry Workers' Hut, Pant-glas Slip	A/B
EA093.124	Varteg Incline	A/B-D
EA001C	Bryn Defaid and Llwydcoed: Fothergill's Patches (west), Bryn-defaid Patch and Tir-yr-argae	A/D
34812	Graig-Rhiw-Ddu Incline	A/U
01797m	Crawshay's Tower, Hirwaun Common	A?/B
226638	Crawshays Tower, Hirwaun	A?/B
262431	Mountain Pit Boiler House	A?/B
262598	Blaen-Nant Quarry IV	A?/B
85104	Bryn Defaid Colliery Engine House (Fothergill's Patches)	A?/B
88073	Penderyn Tramroad	A?/B
91588	Tower Graig Level, Hirwaun	A?/B
EA001.69	Engine House complex at incline top, Mountain Pit	A?/B
EA001.82	Tramroad bridge, Fothergill's Patches	A?/B
EA001.83	Tramroad bridge, Fothergill's Patches	A?/B
EA003.11	Level portal, quarry SE of Blaen-nant, Twyn Blaen-nant	A?/B
EA003.18	Quarry, SE of Blaen-nant, Twyn Blaen-nant	A?/B
EA005.03	Air Shaft, Hirwaun Common	A?/B
EA005.18	Air Shaft, Hirwaun Common	A?/B
EA005.29	Incline, Hirwaun Common	A?/B
EA005.39	Possible Engine House, Hirwaun Common	A?/B
EA010.10	Platform House, Pen-rhiw-llech, W of Merthyrdare Colliery	A?/B
EA011.01	Drum, Blaengwawr Upper Incline, Blaengwawr Quarry	A?/B
EA011.02	Rectangular Feature, Blaengwawr Quarry	A?/B
EA011.09	Tramroad, Blaengwawr Quarry	A?/B
EA026.01	Old Level, Craig Coed, Nant Melin	A?/B
EA027.26	Tower Craig Level Incline I, Hirwaun Common	A?/B
EA027.27	Culvert, Hirwaun Common	A?/B
EA032.04	Brake engine complex at head of incline	A?/B
EA032.05	Incline, Penderyn-foel	A?/B
EA032.06	Brakeman's shelter	A?/B
EA032.07	Kiln, Penderyn-foel	A?/B
EA032.14	Brake Engine Emplacement, associated with Level at Tor-y-foel	A?/B
EA032.15	Level at Tor-y-foel	A?/B
EA032.17	Incline, Penderyn-foel	A?/B
EA032.18	Brake Engine Emplacement	A?/B
EA032.21	2-Cell Structure, Area D Penderyn-foel	A?/B

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EA032.28	Tramroad, Penderyn-foel	A?/B
EA093.71	Upper Five Houses	A?/B
EA026.02	Drum at Old Level, Craig Coed, Nant Melin	A?/U
EA010A	Gadlys Extractive Area: Merthyrdare Colliery	A-D
EA026	Bwllfa and Nant Melin Collieries: Craig Nantmelyn	A-D
262376	Bryn-Defaid Engine Shaft	B
262381	Bryn-Defaid Engine Reservoir	B
262419	Carn-y-Frwydr, Ironstone Tramway I	B
262420	Carn-y-Frwydr, Ironstone Tramway II	B
262447	Bryn-Defaid Levelled Tips II	B
262448	Bryn-Defaid Levelled Tips III	B
262460	Carn-y-Frwydr, Ironstone Workings	B
EA001.07	Engine House, Bryn Defaid Patch	B
EA001.72	Quarry face, Fothergill's Patches	B
EA001.80	Tramroad system, Fothergill's Patches	B
EA001B	Bryn Defaid and Llwydcoed: Croesdy Patch and Ysgbubor-wen	B
EA001H	Bryn Defaid and Llwydcoed: Mountain Pit	B
EA005.32	Incline, Hirwaun Common	B
EA005.54	Sunken Trackway over Rhiw Ymenyn, Hirwaun Common	B
EA006.18	Revetted coal chute and abutment, Tunnel Pit	B
EA011.11	Sunken zig-zag path to quarry workings	B
EA032.01	Rectangular feature, Penderyn-foel	B
EA032.16	Shelter or powder magazine, Penderyn-foel	B
EA082.28	Engine House, Varteg-hill Colliery	B
EA082.36	Upper trackway, Varteg Hill	B
EA093.03	Quarry, Waun-Hoskin	B
EA099.01	Old Quarry, Cwm Lascarn	B
EA110.01	Old Quarry, Cwrt-yr-eos	B
03232m	274 Knobby Drift Ironstone Pit, Johnson Park	B/C
260023	Bryn Defaid Coal Mine	B/C
262368	Bryn-y-Gwyddel, Level IV	B/C
262370	Bryn-y-Gwyddel, Level IV Tramway	B/C
262371	Bryn-y-Gwyddel, Coal & Ironstone Tips Area I	B/C
262372	Bryn-y-Gwyddel, Coal & Ironstone Tips Area II	B/C
262378	Bryn-Defaid Spoil Tips II	B/C
262385	Bryn-Defaid Patch I	B/C
262386	Bryn-Defaid Patch II	B/C
262418	Carn-y-Frwydr, Levels	B/C
262422	Carn-y-Frwydr Ironstone Tramway IV	B/C
262462	Bryn-Defaid Spoil Tip	B/C
262463	Bryn-Defaid Tips	B/C
262590	Blaenant Tips Tramway	B/C
262597	Blaen-Nant Reservoir II	B/C
262599	Blaen-Nant Quarry Tramway	B/C
308306	Penderyn Quarries: Moel Penderyn North Quarry	B/C

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EA001.02	Levels, Fothergill's Patches, Waun-y-gwair	B/C
EA001.08	Trackside feature, Bryn Defaid Patch	B/C
EA001.59	Small hut, Fothergill's Patches, Carn-y-frwydr	B/C
EA001.63	Holding tank, Mountain Pit?	B/C
EA001.74	Quarry, Fothergill's Patches	B/C
EA001.81	Track (Tramroad spur), Fothergill's Patches	B/C
EA001D	Bryn Defaid and Llwydcoed: Tre-Gibbon (north)	B/C
EA001E	Bryn Defaid and Llwydcoed: Tre-Gibbon (south)	B/C
EA003.05	Reservoir, S of Ffynnon Lassa, Twyn Blaen-nant	B/C
EA003.08	Drystone structure, quarry SE of Blaen-nant, Twyn Blaen-nant	B/C
EA003.12	Track, quarry SE of Blaen-nant, Twyn Blaen-nant	B/C
EA003.13	Reservoir, Blaen-nant, Twyn Blaen-nant	B/C
EA003.15	Tramroad to quarry SE of Blaen-nant, Twyn Blaen-nant	B/C
EA005.04	Coal level, Hirwaun Common	B/C
EA005.08	Drift Mine, Hirwaun Common	B/C
EA005.12	Coal Level, Hirwaun Common	B/C
EA005.27	Internal Tramroad System, Craig Colliery & Brickworks, Hirwaun Common	B/C
EA005.35	Stone revetting, Hirwaun Common	B/C
EA005.43	Large quarry scoop and leat, Hirwaun Common	B/C
EA005.44	Quarry, S of Bryn-gwyn Level, Hirwaun Common, east end	B/C
EA005.46	Quarry scoop, S of Bryn-gwyn Level, Hirwaun Common	B/C
EA005.49	Structure, Hirwaun Common	B/C
EA005.57	Linear Scour and Quarry Scoop, Mynydd Cefn-y-Gyngon, Hirwaun Common	B/C
EA010.19	Small quarry and tip, Pen-rhiw-llech, W of Merthyrdare Colliery	B/C
EA010.23	Header pond, Level Fach	B/C
EA010.26	Track to Quarry, Pen-rhiw-llech, W of Merthyrdare Colliery	B/C
EA026.10	Brick Building, S of Craig Coed, Nant Melin	B/C
EA026.14	Tramroad to Level, Craig Coed, Nant Melin	B/C
EA027.15	Trial Level, Hirwaun Common	B/C
EA027.17	Trial Level, Hirwaun Common	B/C
EA027.19	Quarry and tips, Hirwaun Common	B/C
EA027.22	Long quarry workings, Hirwaun Common	B/C
EA027.23	Boundary bank, Hirwaun Common	B/C
EA027.32	Quarry, SE of Tower Craig Level	B/C
EA027C	Hirwaun Common, West: Knobby Drift	B/C
EA029	Llwydcoed Quarries: Old Ironstone Level	B/C
EA032.08	Parallel linear stone dumps	B/C
EA032.09	Tramroad bridge abutment, Penderyn-foel	B/C
EA032.19	Tramroad branch, Penderyn-foel	B/C
EA032.20	Structure, Area D Penderyn-foel	B/C
EA032.29	Tramroad associated with level at Tor-y-foel	B/C
EA032C	Penderyn-foel	B/C
EA032E	Penderyn-foel	B/C

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EA035.02	Old Quarry, SE of Pontbren Llwyd	B/C
EA082.01	Varteg-hill Colliery	B/C
EA082.29	Header Pond, Varteg-hill Colliery	B/C
EA082.32	Sub-rectangular shelter, Craig-ddu Quarry	B/C
EA082.34	Structure, Craig-ddu Quarry	B/C
EA093.05	Varteg-hill Colliery	B/C
EA093.127	Building, Varteg-hill Colliery	B/C
EA093.39	Trackway serving quarry, Waun-Hoskin	B/C
EA093.55	Small rectangular feature, labelled shaft on 1st ed OS, Varteg Hill Colliery	B/C
EA110.05	Quarry, Cwrt-yr-eos	B/C
EA110.06	Curvilinear quarry scoop, Cwrt-yr-eos	B/C
EA110.07	Quarry scoop, Cwrt-yr-eos	B/C
EA110.08	Quarry Scoop, Cwrt-yr-eos	B/C
EA110.09	Quarrying, Cwrt-yr-eos	B/C
EA110.10	Rectangular Quarry, Cwrt-yr-eos	B/C
EA110.11	Linear quarry scoop, Cwrt-yr-eos	B/C
EA005.65	Aberdare Rhondda Railway, Hirwaun Common	B/D
262332	Mountain Pit Engine Shaft	B/U
EA001.61	Platform structure in level cutting, Fothergill's Patches, Carn-y-frwydr	B/U
EA001.65	Shaft, Mountain Pit	B/U
EA001.68	Twin buildings, Mountain Pit	B/U
EA006C	Cwmbach Extractive Area: Tunnel Pit	B/U
EA008	Lletty Shenkin Extractive Area: Lletty Shenkin Quarry	B/U
EA010.20	Incline & tramroad system, Craig Rhiw Ddu Quarry	B/U
EA010.25	Blaengwawr & Level Fach combined incline & tramroad system	B/U
EA011.03	Rectangular Feature, Old Quarry at Blaengwawr	B/U
EA027.34	Old Ironstone Workings, E of Tower Craig Level	B/U
EA027.35	Old Ironstone Workings, NW of Gorllwyn Level	B/U
EA032.10	Rectangular Structure	B/U
EA032.26	Hut Structure, Penderyn-foel	B/U
EA032.27	Possible incline extension, Penderyn-foel	B/U
EA082.37	Quarry Workers' Hut, Varteg Hill	B/U
EA005.09	Craig Colliery and Brick Works, Hirwaun Common	B-D
EA027.30	Tower Craig Level Incline II, Hirwaun Common	B-D

Table 86. Significant water management sub-systems (sorted by significance values A-B)

Water management sub-system	Archaeological significance (value A-B)
Hirwaun	A-C
Llwydcoed (Aberdare)	A?/B

The above results indicate that the most significant survival of extraction features and areas (ie those scoring A or A? in combination) are to be found within the extractive landscapes of

Penderyn-foel (particularly EA032A, EA032B, and EA032D), and the extractive landscape area on Hirwaun Common, West: Twyn Canwylyr (EA027A), and East: Mynydd Cefn-y-gyngon (EA005A), and the well-preserved quarries at Blaengwawr (EA011), with additional discrete features of significance within the Bryn Defaid and Llwydcoed: Fothergill's Patches (east), Carn-y-frwydr (EA001F), Blaennant (EA003), Bwllfa and Nant Melin Collieries: Craig Nantmelyn (EA026), the Gadlys Extractive Areas: Merthyrdare Colliery (EA010A), and Level Fach (EA010C), and at Bryn Defaid and Llwydcoed: Fothergill's Patches (west), Bryn-defaid Patch and Tir-yr-argae (EA001C). Further individual features of significance were identified at Mountain Pit (EA001H) and at Craig-Rhiw-Ddu (EA010B).

Whilst water management features were recorded as part of the extractive areas, most were found to be either poorly preserved or of minor significance in their own right. The most of significant surviving water management sub-systems visited, relate directly to iron works water management; at both Hirwaun and Llwydcoed a number of water management features were found to survive in a largely unaltered form from that depicted on 1st edition OS and earlier maps. These included the main feeder channels (and associated features) for Hirwaun and Llwydcoed, dating to the late 18th and early 19th centuries respectively.

The recommendations made vary from further detailed archaeological record/topographic survey to conservation/management and recommendations relating to the possibilities of public presentation. The recommendations can be found within individual entries contained in the appendices. Of the best-preserved extractive areas investigated, those located within the following six extractive landscapes were considered prime potential candidates for community projects: EA032A, EA032B, EA032D, EA027A, EA005A, EA011, EA099, EA110, and EA112 though the best surviving of the other areas, such as Blaennant EA003 and Level Fach (EA010C), and the remains of workers' housing within EA082 and EA093 might equally be considered, for some level of community project involving conservation, presentation. These are detailed in Table 87, below.

Table 87. Potential candidates for follow-up community projects

Year 4 Area Number	Year 4/6 Sub-Area Number	Area Name
EA032	EA032A	Penderyn-foel
EA032	EA032B	Penderyn-foel
EA032	EA032D	Penderyn-foel
EA0027	EA027A	Hirwaun Common, West: Twyn Canwylyr
EA005	EA005A	Hirwaun Common, East: Mynydd Cefn-y-gyngon
EA011	EA011	Blaengwawr Quarry

Only three of the extractive and water management areas/features visited for the purpose of the current year's fieldwork are currently protected by statutory protection (ie scheduling or listing) at least in part; these are EA112 (EA112.02) adjacent to SAM MM163 Cwmybyrgwm Colliery and EA099 and EA110, covered in part by the scheduled area SAM GM597 Abersychan Limestone Railway. As part of the current year's project the most significant of the extractive areas and features, along with significant water management sub-systems will be considered for further protection. This will form the subject of a separate report.

Bibliography

The work reported here has been informed by underlying literature as cited below. However, the nature of this study and the method of reporting is one that in only a few instances requires direct citation. Furthermore, this bibliography does not include works cited in the summary abstracts from the regional Historic Environment Record or the National Monuments Record; these can be found by consulting the full entry of the relevant record.

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National Library of Wales:

Seven sketch plans and sections formerly enclosed in M1/748-818 now transferred to the Department of Pictures and Maps formerly part of the papers relating to coal mines on the Glam. estate, 1823-43, including **Hirwaun**, Dowlais, Rhigos, Ysgwydd-gwyn, Cilhaul, Gwaun Miskin, Gwaun y Staint, Coed-cae-mawr, Hendre fawr, Werfa, and Aberdare (**NLW Bute 3: M1/748-818**).

Plans attached to D82/4: lease and release from John Wilkins and others and Alice, Dowager Viscountess Windsor, of the **Hirwaun** furnace ground, mine yard and premises (7 a.), p. Penderyn, 1760 (**NLW Bute 4: D82/3-4**)

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Plans engrossed on **NLW Bute 4: D180/12, & D180/14**: lease of minerals under Tyr William Cant Pwynt, Blaenant-y-Wenalt, Cwm Cynon, Gwrid Bach, Gwrid Uchaf, Pentre Bach, Tyr Gwrid Ishaf, Tyr-y-Gwrid Cenol, Graig Gilfach, Pant y Gerddinen and Cwmbach Farms (1,330 a.), and the surface of part of the same (1,068 a.), 1876 (D180/12); conveyance of the site (1 a.) of the Blaengwaur Tramroad from the Blaengwaur Colliery to the Aberdare Canal, 1892 (D180/14)

Plans of the Gadlys Estate and Mines, etc., in the parish of Aberdare, co. Glamorgan, including section of seams, plan of workings on the Seven Feet Seam and the Gellideg Seam, and a plan of workings in the Five Feet Seam. [?late 19th cent.] (NLW Lucas Collection: 3465).

Plan of mountain land belonging to Tir Morgan Watkin and leased to the Aberdare Iron Co. by the late Samuel Glover, esq., in the parish of Aberdare. 1838, July 30 (NLW Maybury 1: 43)

Plan of lands in Aberdare designated as *Ynis pwll du, The Wood, old orchard and garden, Caer odyn* and *Cae dan y ty* showing the boundaries of the Gadlis farm and indicating the cinders deposited by the Gadlis Iron Co. n.d. (NLW Maybury 1: 44)

Particulars of sale of a freehold farm and leasehold coal mines, farms and iron works called the Aberdare and Abernant ironworks and the extensive stock-in-trade thereto belonging in the parish of Aberdare, pursuant to a decree of Chancery made in the cause between Henry Scale and Mary Scale, plaintiffs, and Rowland Fothergill and others, defendants; contains a map and description of the properties. 1846, June 11 (NLW Maybury 1: 46).

Map of the freehold and leasehold property belonging to the Aberdare Iron Company in the parish of Aberdare. 1846 (NLW Maybury 1: 6412)

Map of Hirwaun Common in the County and Manor of Brecon 1858 Tredegar (2 of 3)

Rough Plan of Sundry Encroachments on Hirwaun Common Tredegar (1 of 3)

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Bute Estate Maps, 1824 Surveyor David Stewart GRO D/D BE/1

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Aerial Photographic Resource Getmapping Digital Data (2000) scale 1:10000

Appendix I Geological Details of Year 6 Areas

Area Number	Area Name	Type (main only)	Geological Details ¹⁸	Additional Notes
EA001A	Bryn Defaid and Llwydcoed	Quarries, patchworking, levels, drift mine, balance pit, tips	Lower and Middle Coal Measures: Lower Pennant Measures: made ground	Cinder tip associated with Aberdare (Llwydcoed) Ironworks
EA001B			Lower and Middle Coal Measures: Lower Pennant Measures: Gellideg Coal Crop	Ironstone & coal patch workings, incl. Croesdy Patch, with Levels (ironstone and coal) and Pits, incl. Ysguborwen Pit
EA001C			Lower and Middle Coal Measures: Lower Pennant Measures: Disturbed ground with Gellideg Coal Crop (Curving alignment SSW-NNE). N of area cut by the Werfa Fault (NNW-SSE) and Twyn Ddisgwylfa Fault (NW-SE); between faults, from W to E, are 5-ft, 4-ft, Lower 6-ft Coal Crops; all aligned SW-NE	An extensive area taking in Bryn Defaid Patch (coal & ironstone) to the N, Tir-yr-Argae Balance Pit (ironstone & coal) to the S. The area contains numerous quarries and levels, and associated tips
EA001D			Lower and Middle Coal Measures: Lower Pennant Measures: no further information	Small sub-rectangular quarry (ironstone & coal) associated with workings further S (EA001E)
EA001E			Lower and Middle Coal Measures: Lower Pennant Measures: made ground	A group of quarries (ironstone & coal) and associated tips
EA001F			Lower and Middle Coal Measures: Lower Pennant Measures: Gellideg Coal Crop (E-W at S edge of area)	An area of quarries and levels (ironstone/ironstone & coal) on the E edge of Fothergill's patches
EA001G			Lower and Middle Coal Measures: Lower Pennant Measures: made ground NE of Twyn Ddisgwylfa Fault. Lower 6-ft and 2-ft-9 Coal crops; a short fault (surface) runs SSW-NNE between the latter. At the W boundary of the area a band of sandstone curves N to E	Small quarry (ironstone) S of Gelli-isaf farm
EA001H	Mountain Pit	Pit/shaft, Air-shaft	Lower and Middle Coal Measures: Lower Pennant Measures: Geological surface fault marked level to S (the Werfa	Mountain Pit (coal)

¹⁸ After British Geological Survey, 1979 Merthyr Tydfil & Pontypridd, Solid with Drift Sheets 231 & 248, and Abergavenny, Solid with Drift Sheet 232

Southeast Wales Industrial Ironworks Landscapes

Area Number	Area Name	Type (main only)	Geological Details ¹⁸	Additional Notes
	Pit	Airshaft, engine house, site of tips, incline head	Geological surface fault marked landslip to S (the Werfa Fault), and to the NW the Twyn Ddisgwylfa Fault, both aligned NW-SE	
EA003	Blaennant Balance Pit and Quarries (Ffynnon Lassa)	Balance pit, Quarries, level, tips	Lower and Middle Coal Measures: Lower Pennant Measures: the Lower and Upper Cwmgorse Marine Bands lie to the E. Geological surface fault marked landslip to S (the Werfa Fault), underground fault in Bute Vein proved slightly to S, both aligned NW-SE	Blaennant Balance Pit and incline (outside area) area contains a number of small levels and quarries (ironstone)
EA004	Cwm Nant-yr-Hwch Quarry, Pen-y-waen	Quarry, mine, patchworking, tips	Glacial Boulder Clays over Coal Measures: Lower and Middle Coal Measures: Lower Pennant Measures: 6-ft Coal crop to the S; the Gadlys Fault to the E	Early ironstone patch working and site of an Old Mine
EA005	Hirwaun Common	Quarries, levels, drift mines, tips	Lower and Middle Coal Measures: Lower Pennant Measures: 9-ft and 2-ft-9 and Gorllwyn Coal crops, and the Lower and Upper Cwmgorse Marine Bands. Geological surface fault aligned NNW-SSE, and underground fault in 2-ft-9 Seam aligned NW-SE proved slightly to E, N facing sandstone crags along S boundary of the area. Detached area to N – no information	Craig Colliery & Brickworks; drift/level (coal) workings and quarries, and numerous airshafts on Mynydd Cefn-y-Gyngon
EA006	Cwmbach Extractive Area	Pit/shafts. Quarries, tips	Lower and Middle Coal Measures: Lower Pennant Measures: Black Band & Upper Cwmgorse Marine Band. The Werfa Fault (NW-SE) passes diagonally between the two areas	Three small detached areas of workings: Tunnel Pit (coal); Gnoll Quarry; and workings on Craig-y-Gilfach (quarries and a shaft)
EA008	Lletty Shenkin Extractive Area	Quarries, level, tips	Lower and Middle Coal Measures: Lower Pennant Measures: No 2 Rhondda Coal Crop, above Black Band & Upper Cwmgorse Marine Band, above the Hafod Coal Crop. Geological surface fault aligned NW-SE, and proved underground fault in Bute Vein on almost same position and alignment	Quarries and a level at Lletty Shenkin

Southeast Wales Industrial Ironworks Landscapes

Area Number	Area Name	Type (main only)	Geological Details ¹⁸	Additional Notes
EA010A	Merthyrdare Colliery	Colliery, levels, quarry, tips	Lower and Middle Coal Measures: Lower Pennant Measures: Gorllwyn Coal crop, the Lower Cwmgorse Marine Band on Graig Tir Cae & Upper Cwmgorse Marine Band. Sandstone crags to the W	The Merthyr Dare Colliery (site of), minor level workings and a small quarry scoop
EA010B	Craig Colliery and Craig Rhiw-ddu Quarry	Colliery, quarry, tips	Lower and Middle Coal Measures: Lower Pennant Measures: the Lower Cwmgorse Marine Band on Graig Tir Cae & Upper Cwmgorse Marine Band; the former cut by the Gadlys Fault (NNW-SSE). Sandstone crags to the S	The Craig Colliery and Craig Rhiw-ddu Quarry
EA010C	Level Fach	Level, tips	Lower and Middle Coal Measures: Lower Pennant Measures: the Lower Cwmgorse Marine Band on Graig Tir Cae at Gadlys Fault (NNW-SSE), also takes in Gorllwyn Coal crop (under tip)	Level Fach (coal)
EA011	Blaengwawr Quarry	Quarry, tips	Lower and Middle Coal Measures: Lower Pennant Measures: sandstone above the No2 Rhondda Coal crop	Two sandstone quarries on Graig Rhiwmynach, above Blaengwawr: Quarry to S marked Quarry (stone).
EA026	Craig Nantmelyn	Levels, quarry, tips	Lower and Middle Coal Measures: Lower Pennant Measures: the Gorllwyn Coal crop, the Lower Cwmgorse Marine Band on Graig Tir Cae & Upper Cwmgorse Marine Band. Geological surface fault aligned NNW-SSE, (and slightly to E a proved underground fault (NW-SE) which crosses the 2-ft-9 Seam). S facing sandstone crags along N boundary of area	Levels (coal); to the S, outside the area are the cleared Bwllfa and Nantmelin Collieries, now part of the Dare Valley Country Park.
EA027(a-c)	Western Hirwaun Common (formerly Rhigos Extractive Area)	Drift mine, levels, trial levels, colliery, quarry faces, tips	Lower and Middle Coal Measures: Lower Pennant Measures: the Gorllwyn Coal crop, the Gorllwyn Rider, the Lower Cwmgorse Marine Band on Graig Tir Cae, the Upper Cwmgorse Marine Band & the No 2 Rhondda Horizon. The area, which largely lies between the No1 Hirwaun fault (proved underground) and the No3 Hirwaun faults, is crossed by No2 Hirwaun fault, aligned NW-SE at the surface. A band of grit contours the slopes of Llethr-las, whilst the S boundary of the area is formed by sandstone crags on Twyn Canwylyr. Old level in detached N area appears to have been on the	Tower Craig Level (coal), Gorllwyn Level, other levels (coal), early scoured quarry workings (old ironstone quarries?); trial workings and levels, airshafts, and sandstone quarries at Chwar Canwyllbren

Southeast Wales Industrial Ironworks Landscapes

Area Number	Area Name	Type (main only)	Geological Details ¹⁸	Additional Notes
			Gnapiog crop	
EA028	Hughes's Patch	Patchworkings, level, tips	Lower and Middle Coal Measures: Lower Pennant Measures: an area of made ground. On Gnapiog crop, Hirwaun No 2 Fault (NNW-SSE) crosses W of area	Old quarry/patch workings, site of old level (ironstone),
EA029	Llwydcoed Quarries, Level S of	Level, tips	Lower and Middle Coal Measures: Lower Pennant Measures: Level (trial) W of Twyn Disgwylfa Fault	Old Level (ironstone)
EA030	Pontbren Llwyd Quarry (West)	Quarry, tips	Namurian Millstone Grit Series: Basal Grit	Stone quarry
EA032A	Penderyn-foel	Quarries, level, tips	Carboniferous Limestone Series: Cil-yr-ychan Limestone and Llandyfan Limestone - Oolite and Honeycombed Sandstone. To the N & S Basal Grit of the Namurian Millstone Grit Series. The Dinas Fault (WSW-ENE) runs through area just S of EA032B	'Lime Works', limestone quarry, Silica Level
EA032B	Penderyn-foel	Quarries, tips		Large E-W aligned limestone quarry
EA032C	Penderyn-foel	Quarry, tips		Small quarry scoop
EA032D	Penderyn-foel	Quarry, tips		Limestone quarries
EA032E	Penderyn-foel	Quarry, tips		Limestone quarries
EA035	Pontbren Llwyd Quarries (East)	Quarries, tips	Namurian Millstone Grit Series: Basal Grit	Two small tramroad side quarries
EA082	Varteg-hill Colliery & Craig-ddu Quarry	Colliery, shafts, quarries, tips, levels, coke-	Carboniferous Coal Measures, to the N and W, Pennant Grit, and within the area of Varteg-hill Colliery (West) the Lower Coal Series: Red Ash, Tillery, or Brithdir Coal and quartz conglomerate. Coal crops include the Elled Coal, Big Vein (or	Two quarries (ironstone?), various levels, and the Varteg-hill Colliery (West)

Southeast Wales Industrial Ironworks Landscapes

Area Number	Area Name	Type (main only)	Geological Details ¹⁸	Additional Notes
		ovens, crane	Upper 4ft) Coal, Black Vein (or Rhaslas) Coal and Old Coal	
EA093A EA093B	Varteg Hill Extractive Area	Colliery, shafts, Mine kilns, quarries, level, tips	Carboniferous Coal Measures within the area of Varteg-hill Colliery (East) the Lower Coal Series; Coal crops include the Elled Coal, the Three Quarter Coal, (possibly also the Big Vein (or Upper 4ft) Coal, Black Vein (or Rhaslas) Coal) and Old Coal. Millstone grit located at the NE edge of area (see quarry EA093.03 at E edge of EA093B).	Collieries including Varteg-hill Colliery (East): shaft (ironstone), Bracy's Pit: shafts (coal), levels (coal), various old levels (not specified), areas of patch workings, quarries
EA099	Lasgarn Wood: Nant-y-mailor Quarry	Quarries, level?, tips	Carboniferous Limestone Lower Avonian	Old quarry, (tunnels/level portal?)
EA110	Lasgarn Wood: Cwrt-yr-eos Quarry	Quarries, tips	Carboniferous Limestone Lower Avonian	Old quarry (1 st edition OS map), series of linear quarry cuts (not shown on 1 st edition OS map)
EA112	British Ironworks Extractive Area: Pant-glas Slip	Quarries, tips	Carboniferous Coal Measures, to the N and W, Pennant Grit, and within the area of Cwmybyrgwm Colliery and Pant-glas Slip - the Lower Coal Series: Red Ash, Tillery, or Brithdir Coal (marked uncertain). Greenland Fault runs N-S along W boundary of the area. A plan of 1825-6 also shows the Black Pins just south of the area (RC Tayalor's Plan of the Abersychan Estate of the British Iron Co., surveyed 1825-6.) At Cwmybyrgwm documentary evidence indicates the Tillery Coal crop was exploited. The Elled Coal, Big Vein (or Upper 4ft) Coal, Black Vein (or Rhaslas) Coal and Old Coal coal crops area also located in the area.	Adjacent Cwmybyrgwm Colliery (2 shafts and old level), area of quarry workings, including large WNW-ESE aligned quarry cutting.

Appendix II Plates

Bryn Defaid and Llwydcoed: Aberdare Ironworks Cinder Tip

EA001A



Plate 1. View of slag heap EA001A, view to north

Bryn Defaid and Llwydcoed: Croesdy Patch and Ysgbuborwen
EA01B



Plate 2. Remains of Shop Row, industrial terrace and yards, view to north



Plate 3. Site of level EA001.29 and adjacent rectangular feature, EA001.30, view to south-south-east

Bryn Defaid and Llwydcoed: Fothergill's Patches (west), Bryn-defaid Patch and Tir-yr-argae
EA001C



Plate 4. Engine House NPRN 85104, view to the south-east



Plate 5. Large quarry embayment EA001C, view to the north-west

Bryn Defaid and Llwydcoed: Fothergill's Patches (west), Bryn-defaid Patch and Tir-yr-argae
EA001C



Plate 6. Quarry face in large embayment, EA001C, view to the north

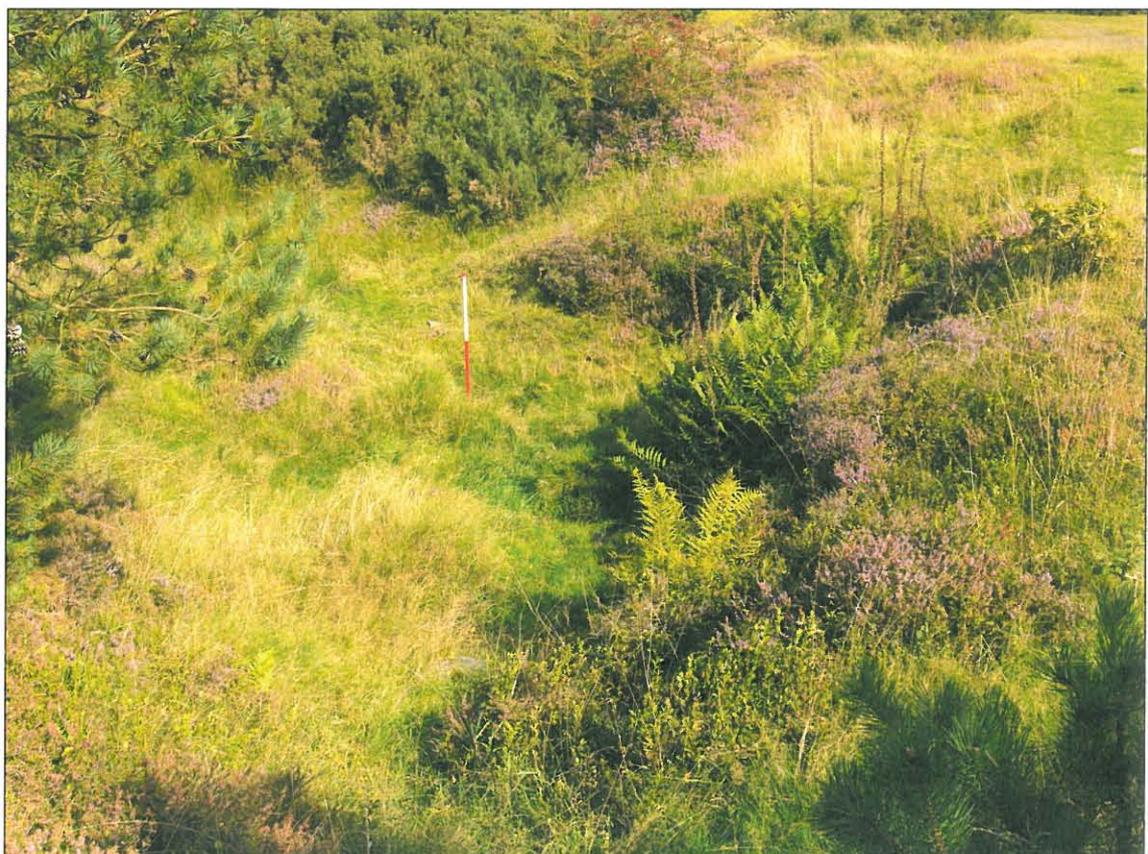


Plate 7. Engine house EA001.07, view to the north-east

Bryn Defaid and Llwydcoed: Tre-Gibbon (south)

EA001E



Plate 8. Tramroad EA001.79, area EA001E, view to the north

Bryn Defaid and Llwydcoed: Fothergill's Patches (east), Carn-y-frwydr
EA001F



Plate 9. Bridge abutment over tramroad NPRN 262419, view to the north



Plate 10. Tips and possible scour, EA001F3, view to the west

Bryn Defaid and Llwydcoed: Fothergill's Patches (east), Carn-y-frwydr
EA001F



Plate 11. Level entrance EA001.02 in quarry face EA001F, view to the south-east

Bryn Defaid and Llwydcoed: Mountain Pit
EA001H



Plate 12. Engine House EA001.69, view to the north-west



Plate 13. Incline EA001.77 approaching Mountain Pit EA001H, view to the north-west

Bryn Defaid and Llwydcoed: Mountain Pit
EA001H



Plate 14. Engine House EA001.69 and associated sunken area, view to the south

Blaennant (Ffynnon Lassa)

EA003



Plate 15. Tramroad NPRN 262599 approaching Quarry NPRN 262598, view to south-south-east



Plate 16. Interior of quarry NPRN 262598, view to the south-west

Blaennant (Ffynnon Lassa)

EA003



Plate 17. Level entrance EA003.11, view to the east

Cwm Nant-yr-Hwch Quarry, Pen-y-waen
EA004



Plate 18. Gamlyn tramroad and abutments EA004.02, view to the north



Plate 19. Terraces for workers' cottages EA004.03, view to the east

Hirwaun Common, East: Mynydd Cefn-y-gyngon
EA005A



Plate 20. Quarry EA005.33 and incline EA005.32, view to the south



Plate 21. Structure EA005.39, view to the west

Hirwaun Common, East: Mynydd Cefn-y-gyngon
EA005A



Plate 22. Major scour or gully, EA005, view to the north



Plate 23. Approach to collapsed Drift mine entrance EA005.08 and eastern machinery mount, Craig Colliery, EA005.09, view to the east

Hirwaun Common, East: area west of Waungron
EA005B



Plate 24. Tramroad Formation EA005.65, view to the east

Cwmbach Extractive Area: Tunnel Pit
EA006C



Plate 25. Masonry revetment, Tunnel Pit tramroad, EA006, view to the north-west

Lletty Shenkin Extractive Area: Lletty Shenkin
EA008



Plate 26. Main Lletty Shenkin Quarry EA008, view to the south-south-east



Plate 27. Remains of Lletty Shenkin Cottages EA008.02, view to the south-south-east

Gadlys Extractive Area: Merthyrdare Colliery
EA010A

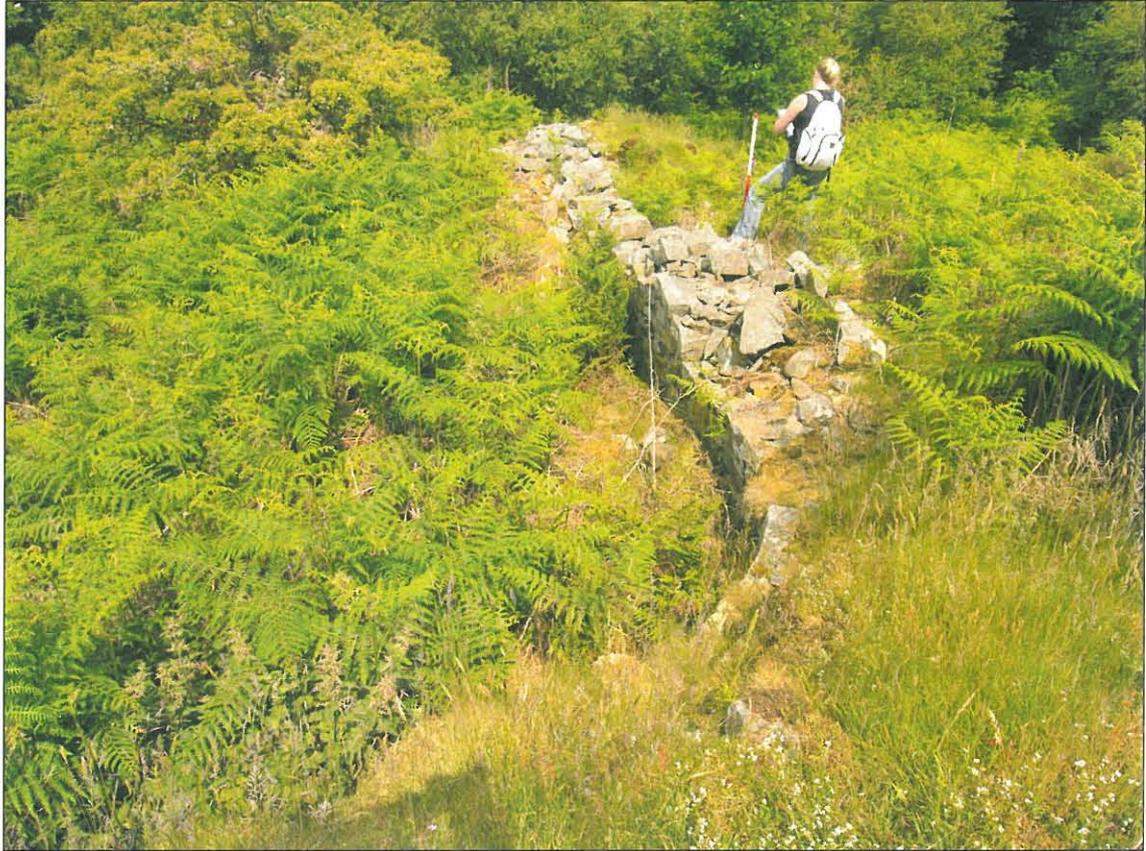


Plate 28. Structure EA010.10, curved corner, view to the east



Plate 29. Quarry EA010.19, view to the north-west

Gadlys Extractive Area: Craig Colliery and Craig Rhiw-ddu Quarry
EA010B



Plate 30. Tips in EA010B near the base of incline EA010.18, view to the north



Plate 31. The site of Craig Colliery, NPRN 80623, view to the south-west

Gadlys Extractive Area: Level Fach
EA010C



Plate 32. Arched entrance to Level Fach EA010.24, view to the south



Plate 33. Concrete structure EA010.22, view to the west

Gadlys Extractive Area: Level Fach
EA010C



Plate 34. Revetted incline EA010.25 and approach to Level Fach EA010.24, including spring for arch over level approach, view to the north-east

Blaengwawr Quarry
EA011



Plate 35. Blaengwawr Quarry South EA011, showing embankment of possible tramming line on right, view to the north-east



Plate 36. Drum House EA011.01, view to the south

Blaengwawr Quarry
EA011



Plate 37. Rectangular building EA011.02, view to the west

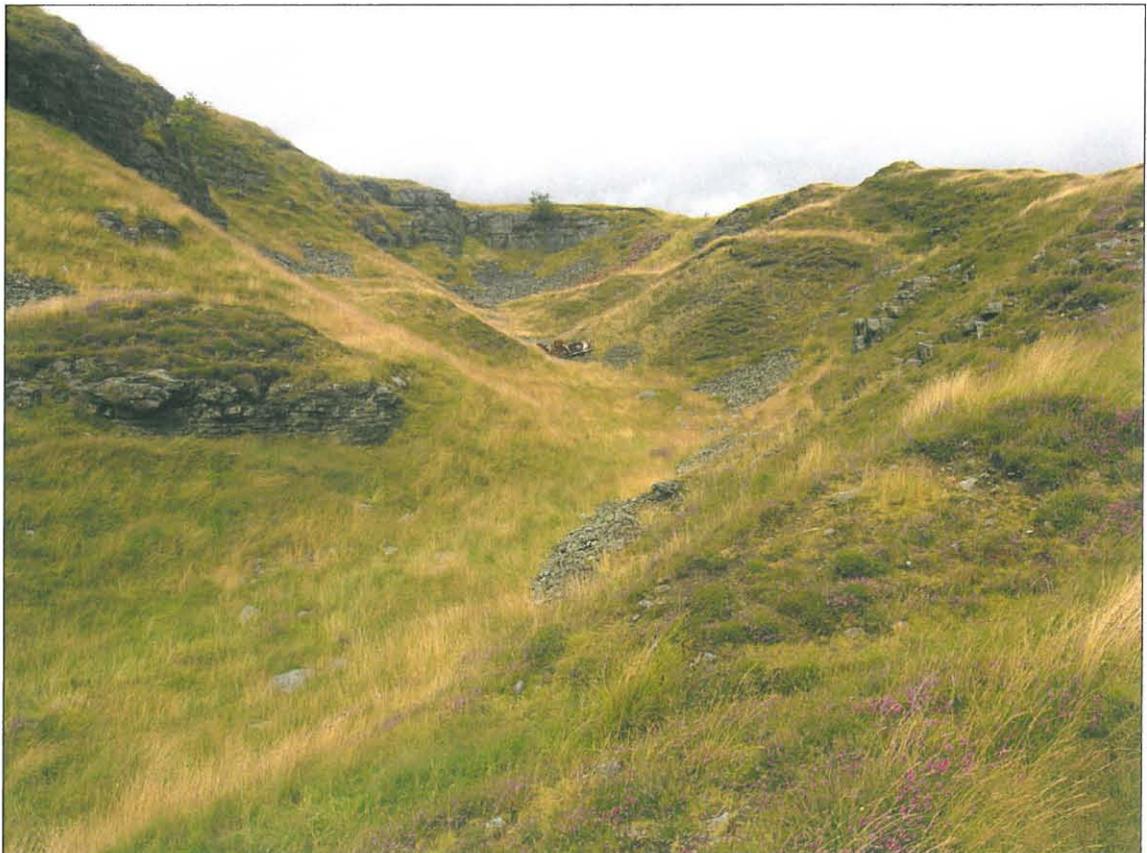


Plate 38. Blaengwawr Quarry North EA011.03, view to the north-west



Plate 39. Level entrance EA026.01, view to the north



Plate 40. Interior of shaft structure EA026.13, view to the west

Hirwaun Common, West: Twyn Canwyllyr
EA027A



Plate 41. Quarry face and scour EA027.19, view to the south

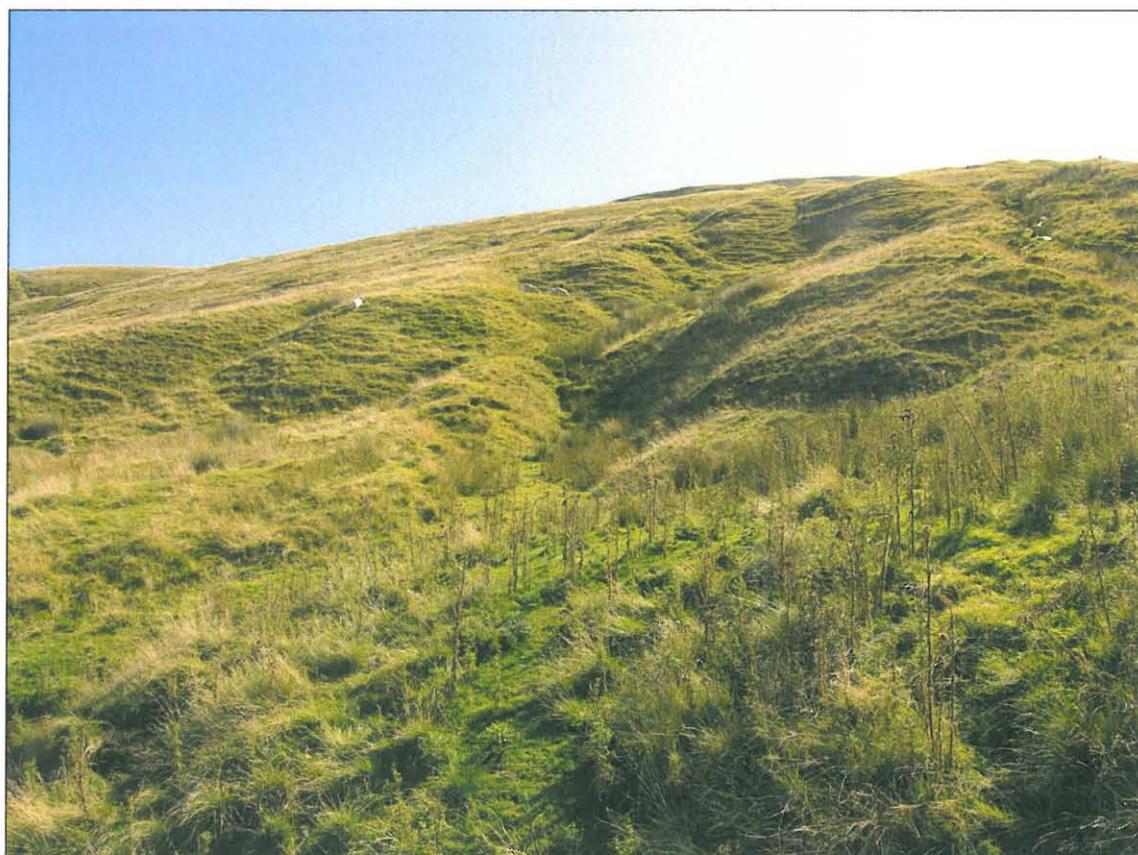


Plate 42. Scoured area of hillside, view to the east

Hirwaun Common, West: Twyn Canwyllyr
EA027A



Plate 43. Tower Graig Level complex, NPRN 91588, view to the north-east



Plate 44. Crawshay's Tower PRN 01797m, view to the north-west

Hirwaun Common, West: area north of Bute Pit
EA027B



Plate 45. Area of tramroad cuttings, EA027.03-05, view to the south

Hirwaun Common, West: Knobby Drift
EA027C



Plate 46. Site of Knobby Drift mine, EA027.02, view to the south



Plate 47. Tramroad formation and tips at Knobby Drift, EA027.02, view to the west

Llwydcoed Quarries: Old Ironstone Level
EA029



Plate 48. Level entrance EA029, view to the north

Pontbren Llwyd Quarry
EA030



Plate 49. Quarry EA030, view to the south

Penderyn-foel
EA032A



Plate 50. South embayment EA032A, view to the north-east



Plate 51. Linear tips to south of quarry, EA032A, view to the east

Penderyn-foel
EA032A



Plate 52. Quarry face EA032A, south embayment EA032A, view to west

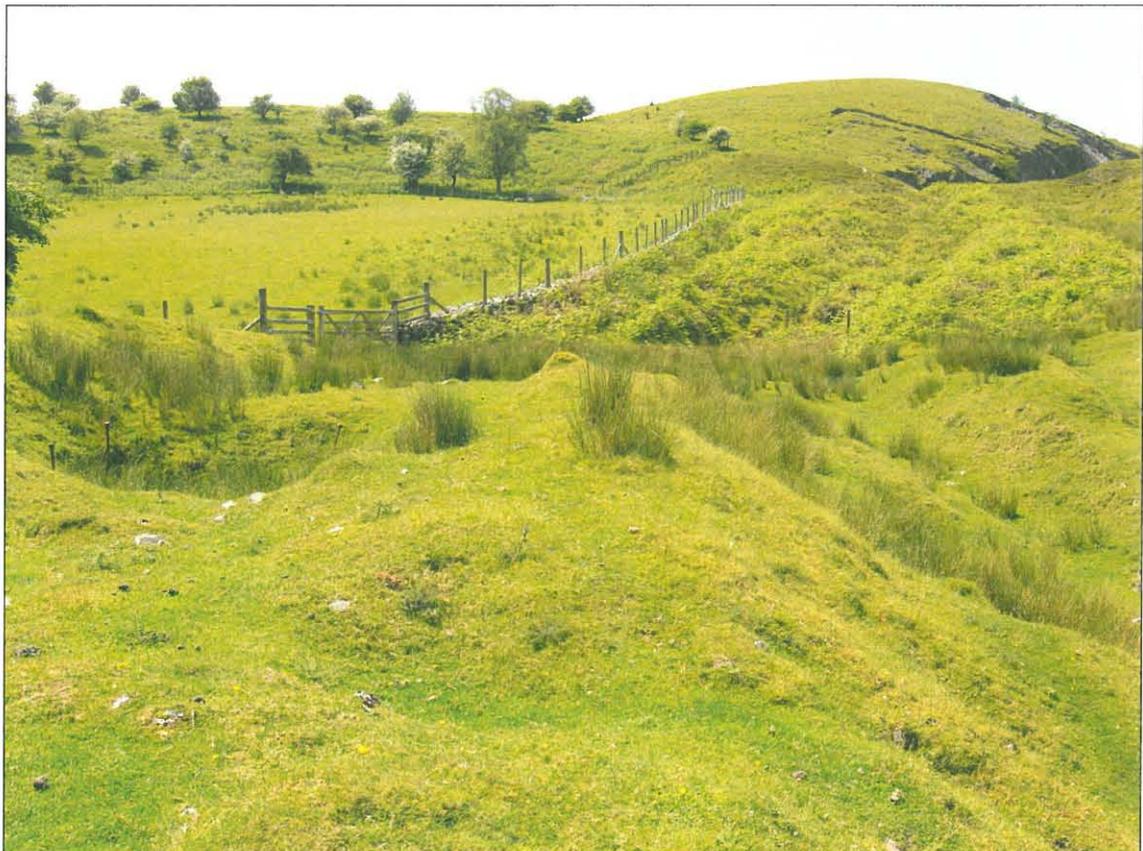


Plate 53. Brake engine emplacement EA032.14 towards level EA032.15, view to the west

Penderyn-foel
EA032B



Plate 54. Level EA032.15 and cutting, view to the west



Plate 55. Quarry cutting EA032B, view to the east

Penderyn-foel
EA032B



Plate 56. North side of quarry EA032B showing stepped platforms, view to the north



Plate 57. Quarry face, EA032B, view to the south

Penderyn-foel
EA032B



Plate 58. Kiln EA032.07, view to the south-east



Plate. 59 Brake engine emplacement EA032.04, view to the north-east

Penderyn-foel
EA032C



Plate 60. Quarry embayment EA032C, view to the west-south-west



Plate 61. Vaulted structure EA032.16, view to the north

Penderyn-foel
EA032D



Plate 62. Area EA032D, view to the east



Plate 63. Mouth of large quarry embayment EA032D, view to the west

Penderyn-foel
EA032D



Plate 64. Brake engine emplacement EA032.18, view to the north-east



Plate 65. Revetted field boundary or incline, in area EA032D, view to the north-west

Penderyn-foel
EA032E



Plate 66. North slope of area EA032E, view to the east

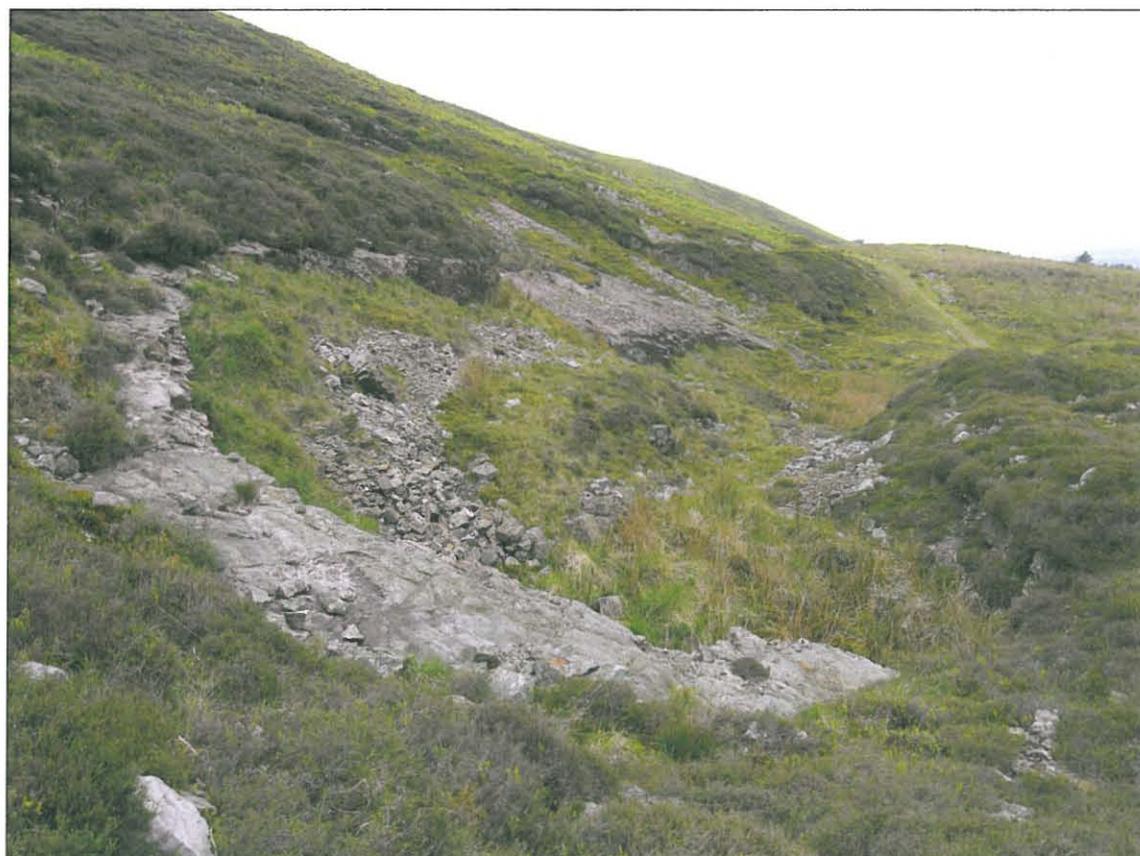


Plate 67. Quarry embayment EA032E, view to the west

Old Quarries, east of Pontbren Llwyd
EA035



Plate 68. Quarry face cut into slope, EA035, view to the north

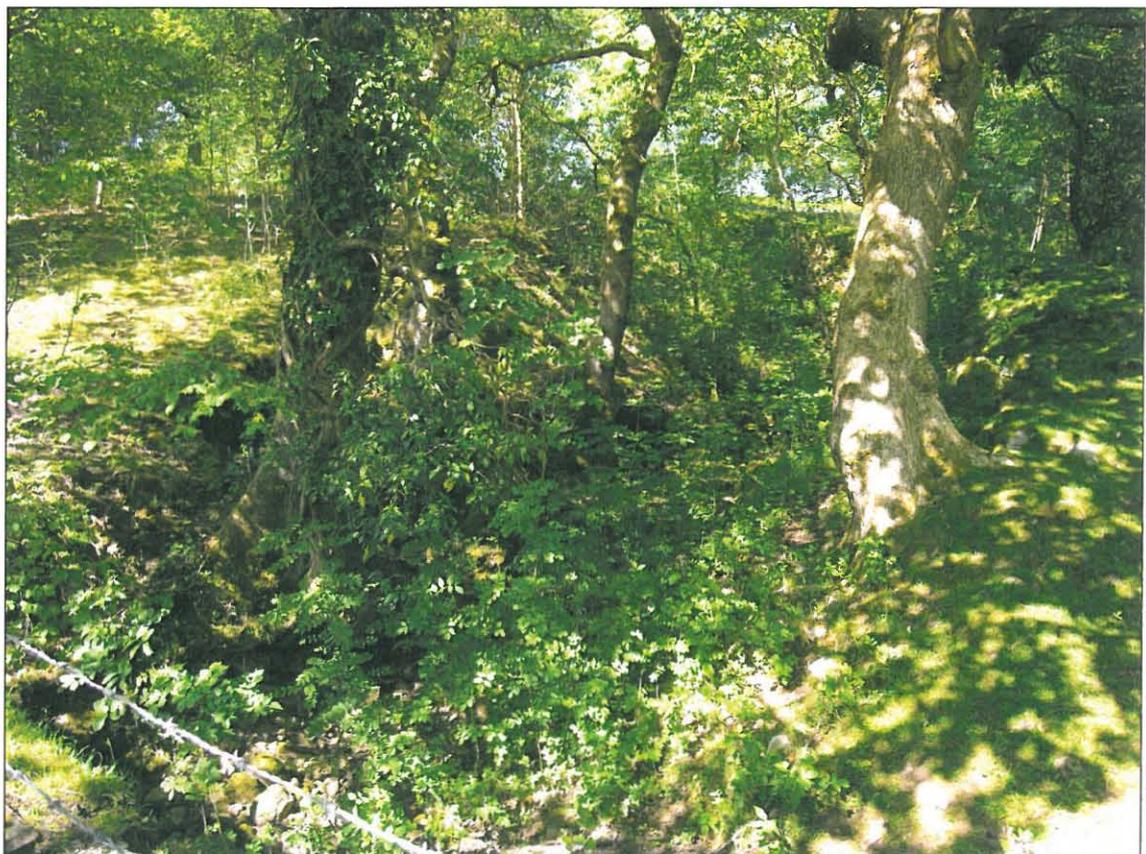


Plate 69. Quarry face around stream EA035, view to the east north-east

Varteg-hill Colliery and Craig-Ddu Quarry
EA082



Plate 70. Concrete Structure EA082.10 (coke ovens shown on 1st edition), view to the east

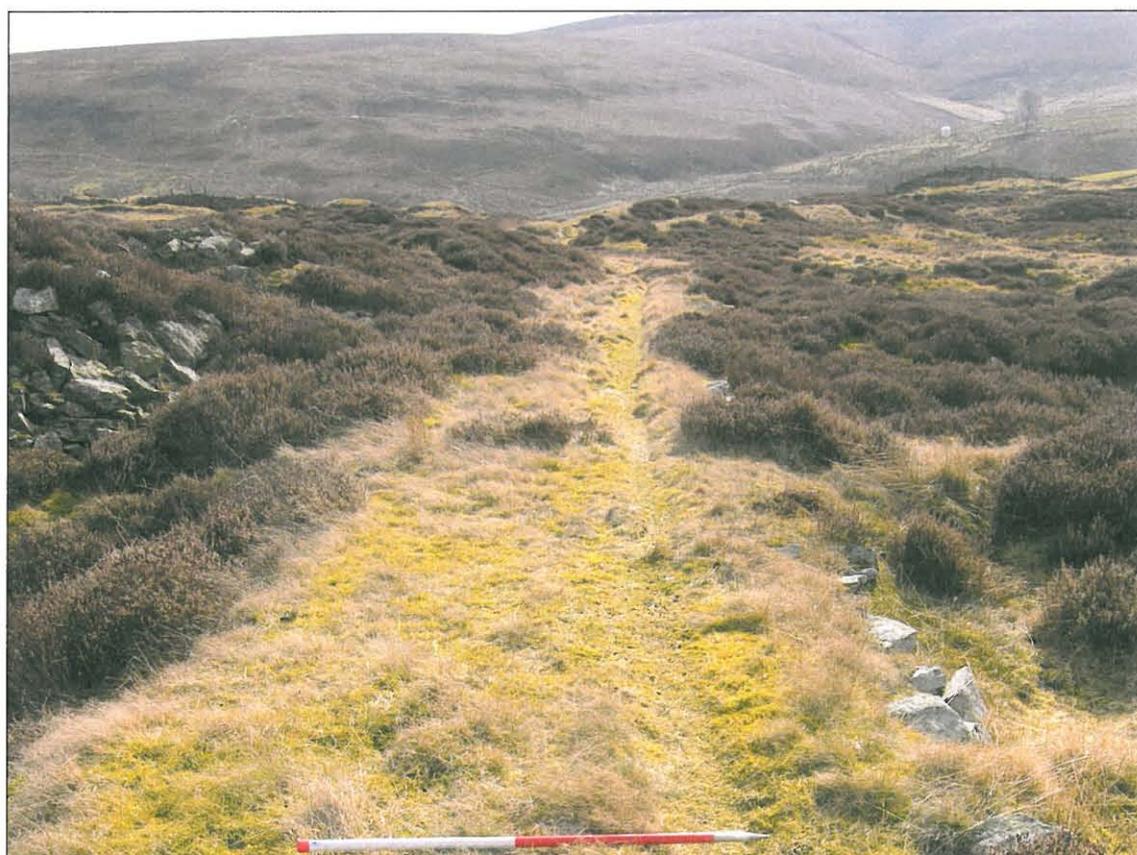


Plate 71. Embanked Tramroad or Trackway EA082.04, view to the south

Varteg-hill Colliery and Craig-Ddu Quarry
EA082



Plate 72. Engine House EA082.28, view to west-north-west

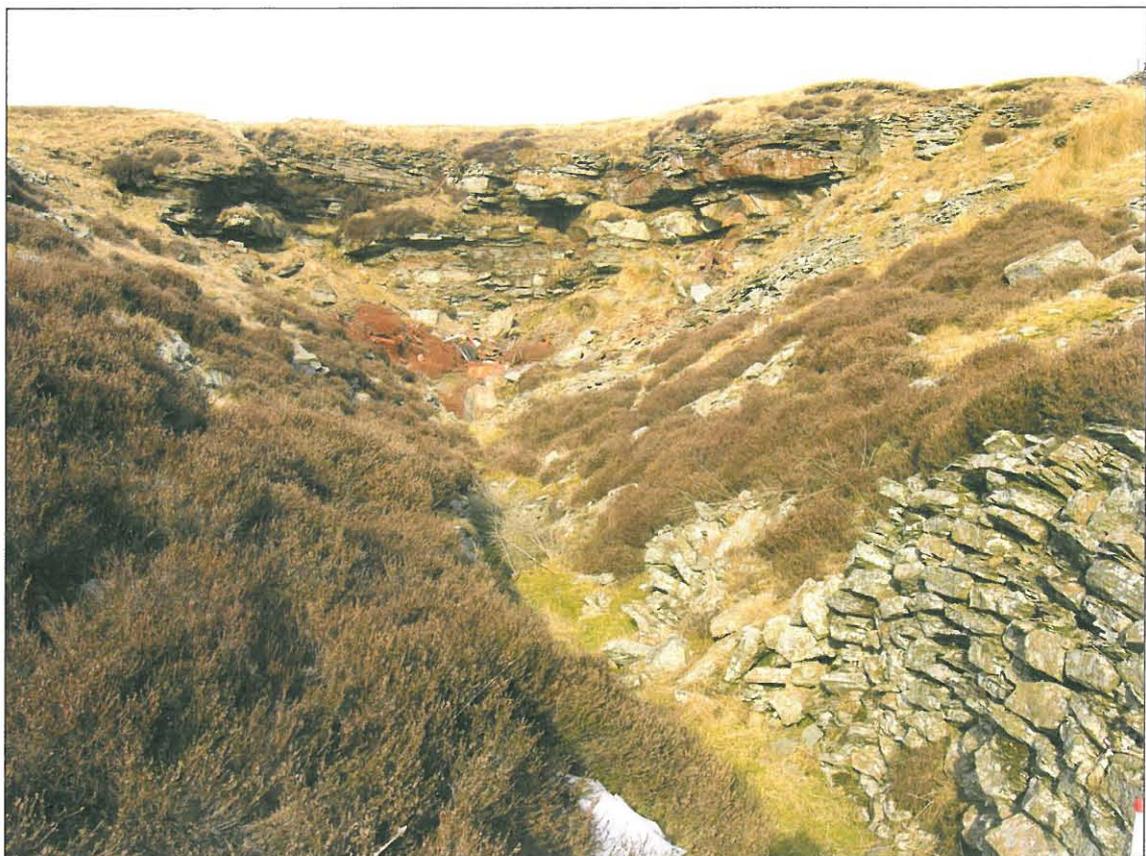


Plate 73. Head of linear quarry EA082.04, view to north

Varteg-hill Colliery and Craig-Ddu Quarry
EA082



Plate 74. Header Pond EA082.29, view to south-south-east



Plate 75. Quarry Tramroad or Trackway EA082.36, view to east-north-east

Varteg-hill Colliery and Craig-Ddu Quarry
EA082



Plate 76. Remains of Cottages, Collier's Row, EA082.25, view to west



Plate 77. Shooting butt shelter EA082.31 within quarry workings EA082.30, view to north-west

Varteg-hill Colliery and Craig-Ddu Quarry
EA082



Plate 78. Stone revetting within quarry workings EA082.30, view to north-north-west



Plate 79. Structure or shelter EA082.34, view to east

Varteg-hill Colliery and Craig-Ddu Quarry
EAO82



Plate 80. Tips at quarry workings EA082.30. view to east

Varteg Hill Extractive Area: Varteg Waste
EA093A



Plate 81. Benches on main quarry face EA093.03, view to west



Plate 82. Main quarry embayment EA093.03, view to south-east

Varteg Hill Extractive Area: Varteg Waste
EA093A



Plate 83. Quarry faces and spoil EA093.03, view to south



Plate 84. Shelter EA093.35 at base of tip, view to east-south-east

Varteg Hill Extractive Area: Gallowsgreen and Waun-Hoskin
EA093B



Plate 85. Colliery Tips EA093.21 (on 3rd edition OS map), view to north-east



Plate 86. Concrete structure EA093.126, view to south-west

Varteg Hill Extractive Area: Gallowsgreen and Waun-Hoskin
EA093B



Plate 87. Paired shafts EA093.55, showing stone lining, view to north



Plate 88. Terraced platforms and yards of Upper Five Houses EA093.71, view to north-west

Varteg Hill Extractive Area: Gallowsgreen and Waun-Hoskin
EA093B



Plate 89. Tramroad EA093.37 and adjacent masonry feature EA093.134 on site of 'Mine kiln' (1st edition OS), view to east



Plate 90. Varteg Incline EA093.124, middle surviving section, view to east

Lasgarn Wood: Nant-y-mailor Quarry
EA099



Plate 91. Arched level or culvert entrance EA099.05, view to east



Plate 92. Tips within quarry EA099.01, view to west



Plate 93. Entrance to quarry scoop EA110.07, view to north-east



Plate 94. Workings EA110.03, downslope of tramroad, view to west

British Ironworks Extractive Area: Pant-glas Slip
EA112



Plate 95. Boulder chute or gully at Pant-glas Slip EA112.02, view to west



Plate 96. Boulders at Pant-glas Slip quarries EA112.02, British Ironworks beyond, view to east-south-east

British Ironworks Extractive Area: Pant-glas Slip
EA112



Plate 97. Curving embanked trackway EA112.17 to southern quarry area at Pant-glas Slip EA112.02, view to south



Plate 98. L-shaped dry-stone walled feature, part of EA112.48, view to east

British Ironworks Extractive Area: Pant-glas Slip
EA112



Plate 99. Platform Hut or Quarry Workers' shelter EA112.48 and adjacent trackway EA112.17, Cwmbyrgwm Colliery at upper left, view to north-north-east



Plate 100. Platform Hut or Quarry Workers' shelter EA112.48 and adjacent trackway EA112.17, view to north-east

British Ironworks Extractive Area: Pant-glas Slip
EA112



Plate 101. Reservoir near Pant-glas Slip EA112, British Ironworks in background, view to east



Plate 102. Split boulders, spoil tip and Fe post-seat (shooting position) EA112.92, view to north

British Ironworks Extractive Area: Pant-glas Slip
EA112



Plate 103. Upper quarry scoop Pant-glas Slip EA112.02, view to west



Plate 104. Workings above EA112.48, quarry scoops with revetted sides, view to west