ABERLLYN MINE

1

1

T

the state

1

1

1

4

(and the second

17 mm

1

ARCHAEOLOGICAL ASSESSMENT

G1194

REPORT NO. 133

VOL 1

Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

ABERLLYN MINE

ARCHAEOLOGICAL ASSESSMENT

Prepared for Snowdonia National Park Authority

By P.T.Muckle

with historical Summary by R.W.Vernon

October 26th 1994

Gwynedd Archaeological Trust Report No. 133

ABERLLYN MINE

ARCHAEOLOGICAL ASSESSMENT

CONTENTS

Page

VOL 1

| 1. | INTRODUCTION | 1 |
|-----|---|----|
| 2. | TERMS OF REFERENCE | 1 |
| 3. | METHODOLOGY | 2 |
| 4. | SOURCES | 2 |
| 5. | SITE LOCATION | 3 |
| 6. | GEOLOGY AND MINE WORKINGS | 5 |
| 7. | MINING HISTORY | 9 |
| 8. | SUMMARY OF MAJOR SURFACE FEATURES | 13 |
| 9. | ADITS AND SHAFTS - SITE LIST | 15 |
| 10. | SITES OF PARTICULAR INTEREST OR IMPORTANCE | 16 |
| 11. | SUMMARY LISTS OF SITE CONDITION | 16 |
| 12. | PRIORITIES FOR RECORDING AND CONSERVATION - SITE LIST | 29 |
| 13. | POTENTIAL CLEARANCE OF VEGETATION - SITE LIST | 31 |
| 14. | POTENTIAL EXCAVATION AND CLEARANCE - SITE LIST | 37 |
| 15. | SUMMARY OF RECOMMENDATIONS | 40 |
| 16. | METHODOLOGY FOR FURTHER WORK | 41 |

VOL 2

17. GAZETTEER OF ARCHAEOLOGICAL FEATURES

FIGURES

Fig 1 Location map showing lodes in the vicinity of Betws y Coed.

- Fig 2 Plan of Aberllyn Mine workings c.1885.
- Fig 3 Aberllyn Mine: Section of Eastern Workings. 1905.

Fig 4 Aberllyn Mine: Section of Western Workings and Mine Plan. 1905.

- Fig 5 Pen yr Allt Mine Plan c. 1902.
- Fig 6 Pen yr Allt: Section of Workings. c. 1902.
- Fig 7 Aberllyn Mine: c. 1885.
- Fig 8 Aberllyn Mill: c. 1904.
- Fig 9 Aberllyn Mill: Location of features 1994.

Fig 10 Aberllyn and Penyrallt Mines: Location of features 1994.

1.0 INTRODUCTION

In June 1994 the Gwynedd Archaeological Trust (GAT) was contracted by the Gwynedd County Council as Snowdonia National Park Authority (SNP) to undertake an assessment of the industrial archaeological interest of derelict lead and zinc mine in the Gwydyr Forest. The results of the survey are to be incorporated into the design of a reclamation scheme, the stated aims of which are to:-

Establish in detail the nature of the derelict land within the mine sites and advise on the best means of its treatment having regards to:

a) the need to make safe structures and mine workings which pose a threat to public health and safety;

b) reducing the risk of spoil tips polluting water courses with toxic material;

c) the need to protect and enhance the nature, landscape and industrial archaeological interest of the site and its surroundings;

d) the prospect for developing beneficial afteruse for the site, where possible utilising existing features.

2.0 TERMS OF REFERENCE

"The consultants appointed will be expected to prepare a factual report, to be incorporated in the main report of Site Investigations, which contains an assessment of the sites in terms of their regional and national importance for industrial archaeology, together with prescriptions as to the best means of conserving important features during reclamation works. It is expected that they will undertake the following tasks;

1. To assess the archaeological value of the sites giving particular attention to the presence of remains characteristic of the area and to remains of unusual importance.

2. To review existing literature regarding the Gwydyr Forest.

3. To identify, as far as possible from field evidence, mine plans and other primary and secondary sources, all shafts, adits and other features associated with the mines such as spoil tips, ore processing, milling, smelting and other surface works within the site boundaries, indicating their location by means of a plan at an appropriate scale. Other archaeological sites within the area should also be identified.

4. To assess the fragility of the sites and their susceptibility to disturbance.

5. To advise the lead consultants, during the design of the reclamation works, of those features of interest which may be damaged or destroyed by the works and to ensure that adequate provision is made to survey and record in detail those features. Wherever possible the sites' archaeological value should be protected and enhanced.

6. To maintain a "watching brief" whilst contractors are on site and to records any features which may be discovered during the course of works."

3.0 METHODOLOGY

The Documentary research and historical background to the site was undertaken by R.W. Vernon on behalf of the Trust. The ground survey and preparation of this report has been undertaken by members of the Trust. The assessment was divided into three stages;

3.1 Documentary and Archive Research

This was undertaken by R.W. Vernon, who is co-author of a number of books about the lead mines of the Gwydyr Forest, mostly using information gathered during previous research. A list of sources, historical summary and relevant maps are included in this report.

There were no sites recorded within the area on the Gwynedd Sites and Monuments Record.

3.2 Field Survey

A number of sites in the Gwydyr forest were visited with R.W.Vernon prior to the main field survey. During these familiarisation visits a record form was devised to deal with the varied site types encountered and their significance, condition and potential. The results of the surveys have been used to draw up lists of recommendations regarding priorities and potential for archaeological recording and conservation.

It was decided at the start of the survey to number each feature separately, as far as was practical, because of the wide variation in type, construction and condition. Around 140 records are included in the gazetteer, some of which contain several features of the same type. The sites were recorded onto record forms or directly into a database loaded onto a field computer. The sites were marked on a base map enlarged to 1:1250, although no new sites were accurately surveyed. The available plans of the mill were found to be too inaccurate to use for archaeological purposes and it was necessary to produce a new plan using tapes and offsets, although this is not necessarily definitive at this stage (Fig 9).

Features were photographed with black and white print film and colour slides, weather and site conditions permitting.

3.3 Report and Recommendations

The information from stages (1) and (2) was assimilated to produce a series of lists relating to condition, priorities for recording and conservation, potential vegetation clearance and potential excavation. There is a summary of important or interesting sites and recommendations at the end of the report. The report also contains a detailed gazetteer of sites and features (Vol 2).

4.0 SOURCES

4.1 Maps

a) Ordnance Survey (OS) 25" to the mile (1:2500), 1888 and 1913 editions.

b) Mine plan showing the proposed layout of the Brunner Mond mill and Spelter plant (Brunner Mond) c.1897.

c) Plan of the Aberllyn Mine by John Roberts, 1885. Scale: 10 Fathoms to an Inch. Caernarfon Record Office

d) Plan and Section of Aberllyn Mine by C.M.Kneebones (1905). Caernarfon Record Office

e) Plan and Section of Pen yr Allt Mine by C.M.Kneebones (1902). Caernarfon Record Office

2

4.2 Unpublished Sources

4.2.1 Company Records (Public Record Office, Kew, London)

Aberllyn Ltd. BT31/24558/154558 Aberllyn Zinc Mines Ltd. BT31/23744/147831 Aberllyn Mining Company Ltd. BT31/2435/12339 European Contract Syndicate BT31/32084/113603 Griffin Silver Lead Mining Co.Ltd. BT31/2459/12546 Gwydyr Amalgamated Mining Co. Ltd BT31/2764/15063 South De Eresby Mountain Lead Mining Co.Ltd. BT31/2398/11971

4.2.2 Gwydyr Estate Records

Caernarfon Record Office Ancaster Estate Papers (private) Grimsthorpe Castle, Lincolnshire

4.3 Published Sources

Bennett, J. and Vernon, R.W. 1992. Mines of the Gwydyr Forest Part 4. Aberllyn Mine, Betws-y-Coed and Adjacent Setts.

HMSO (Environmental Consultancy University of Sheffield and Richards Moorehead & Laing Ltd.) 1994. The Reclamation and Management of Metalliferous Mining Sites.

5.0 SITE LOCATION

The Aberllyn and the adjacent Penyrallt Lead Mines lie on the western side of the Aberllyn Gorge about one kilometre north of Betws y Coed just off the B5106 (centred on SH795578). The Gorge lies just below Llyn y Parc which was the main source of water for the mines. The Aberllyn workings are concentrated specifically in the area of the Gorge whilst the Penyrallt workings lie a little further south and extend westwards to Penyrallt Farm (Fig 1). The site encompasses the boundary of the Aberllyn Site of Special Scientific Interest (SSSI).

The Aberllyn Mill is a massive stone-built structure with 9 levels, built as steps into the lower slopes of the valley side. The mill measures 80m from top to bottom (east to west), 50m from side to side and has an overall fall in height of 30m. It is presently obscured by a fairly young forestry plantation, although it was visible in the 1970's. The structure itself is comparatively open, although there are mature trees on some levels threatening the structure, and saplings on all levels.

The entire area is presently under forestry plantation, and this coupled with the very steep gradients makes moving around the site awkward at best and dangerous at worst. Identifying and locating sites is difficult under such conditions, whilst photography and survey are often impossible.



Fig 1 Location Map showing Lodes in the Vicinity of Betws y Coed

6.0 GEOLOGY AND MINE WORKINGS

6.1 Aberllyn Mine

Extensive workings have occur on two main lodes, the Hard and Soft, on a NNW-SSE trend which roughly follows the alignment of the Aberllyn Gorge. A further lode, the Intermediate, on a similar trend has been worked intermittently. The lodes occur in a sequence of Ordovician shales and volcanic rocks that outcrop extensively in the Gwydyr Forest (Fig 1).

The earliest mine workings are probably those in the vicinity of Aberllyn Cottage which lies between Llyn-y-Parc and the Aberllyn Gorge and were probably confined to shallow stoping on the back of the Hard Lode.

By 1878, three levels had been driven in a northerly direction from the Gorge, and these are shown as No's 1,2, and 3 on an Abandonment Plan dated 1885. A further level, the Valley Crosscut, is also shown on the 1885 Plan at a location at the southern end of the Gorge, driven with the intention to identify the Lodes at depth (Fig 2)



Fig 2 Plan of Aberllyn Mine Workings c.1885

The most recent plan of the workings dating from 1905 shows just how extensively the mine was worked early this century for zinc. By that date six levels had been driven into the lode, the longest being the No.4 which followed the Hard Lode beneath Llyn-y-Parc. At this time levels 1 to 5 were purely for access and ventilation as the ore was trammed out of the mine via the lowest level, the No. 6 to a large mill located at the southern end of the Gorge. A ventilation shaft was also sunk from the surface and was located between Aberllyn Cottage and the Forestry Road. The workings on the plan are referred to as the Western and Eastern workings on the Hard and Soft Lodes respectively (Figs 3 and 4).

An examination of the workings indicates that no new levels were driven from the surface at Aberllyn after 1905, and it seems likely that the operations carried out between 1905 and 1920 were confined to stoping and underground exploratory work.



Fig 3 Aberllyn Mine: Section of Eastern Workings. 1905.



Fig 4 Aberllyn Mine: Section of Western Workings and Mine Plan. 1905.

6.2 Penyrallt Mine

The Penyrallt Mine workings are confined to two lodes. The Penyrallt Lode runs roughly east -west from the bottom of Aberllyn Gorge to Penyrallt Cottage. A further lode, the Griffin, runs NNW-SSE and terminates at the Penyrallt Lode. In addition several minor lodes exist, but none have been worked extensively.

The Penyrallt Mine was originally part of the Griffin Mine which had its No. 1 or main adit between the railway and the Main Road. This Adit was driven on the Griffin Lode, but impoverishment of the Lode forced operations to be concentrated on the Penyrallt Lode. Two levels were driven westward on the Penyrallt Lode, the uppermost being the No.3. The extent of these workings are shown on the 1885 Abandonment Plan.

When Penyrallt was re-opened this century, further levels where driven on the Penyrallt Lode above the Griffin Mine No.3 Level. An air shaft was also sunk from a location immediately to the east of Penyrallt farm down to the top level. To confuse matters, the new top level was called the No.1 and the old Griffin No.3 became the Penyrallt Mine No.4 and the Griffin No.2 became the Penyrallt No.5. Eventually a new haulage crosscut was driven to intersect the No.4 level to ease tramming of ore to the Aberllyn Mill (Figs 5 and 6)



Fig 5 Pen yr Allt Mine Plan. c. 1902.



Fig 6 Pen yr Allt: Section of Workings. c. 1902.

7.0 MINING HISTORY

7.1 Aberllyn

The first mention of a mine at Aberllyn is in 1838 when Messrs. Gregory and Co. employed up to 15 men to clear the old works. This operation ceased in 1841 but it is presumed that the area of their interest was in the vicinity of Aberllyn Cottage. They raised lead and zinc ores with some pyrites. In addition some black earth was mined which was probably the weak shales associated with the Soft Lode.

Between 1841 and 1878, the mine was operated by several small partnerships never consisting of more than six men. However by the end of this period three-levels had been driven.

Charles Brougham Parry acquired the Aberllyn lease in June 1877 but he had sold it by November of that year to the Aberllyn Mining Company. This company was formally floated during June 1878, and as usual during this period of high lead prices on the metal markets, optimism was high. A dressing floor consisting of a crusher, jigs and a circular buddle driven by a waterwheel was built close to the mouth of the No.3 level, and an incline constructed to take the dressed ore from the ore dressing plant to the foot of the Aberllyn Gorge. By 1879 ore was being washed, and in the following year, the Valley Cross-Cut was commenced at the foot of the Gorge (Fig 7).



Fig 7 Aberllyn Mine c. 1885.

During 1881, Aberllyn was combined with two other local mines, Clementina and D' Eresby Consols, and the new company, Gwydyr Amalgamated Mines Ltd, was registered in March 1881. Despite being the mine with the most potential for investment, the company could not compete with falling lead prices and the company was wound up in February 1883. The following October, Messrs Dew and Son auctioned off the Aberllyn Dressing plant that consisted of:-

Two waterwheels, 30ft x 4ft and 12ft x 2ft. 14 inch Blakes Patent Stone Crusher. Two sets of large Automatic Jiggers. One set of small Automatic Jiggers.

In addition One 5ft Incline Drum with 70 fathoms of 1 inch winding rope, 240 fathoms of tram road, 4 trams, and a smithy were also auctioned off.

Between 1883 and 1894 the mine was leased on several occasions, but no significant work was carried out.

However in November 1894 the Aberllyn lease was assigned to John Brunner of Brunner Mond Ltd and was the advent of the most extensive mining and production during the history of Aberllyn and the adjacent Penyrallt Mine. Initially Brunner Mond carried out an exhaustive sampling and testing programmes of the lodes. They were primarily after the zinc blende which was the predominant ore at the two mines, the better quality of ores at Aberllyn often being up to 50% Zinc. The better ores at Penyrallt Mine however, only got up to 15% Zinc. Milling test were also carried out on the sampled ore by Messrs George Green of Aberystwyth and from all these results Brunner Mond decided to construct a gravity separation mill capable of producing 160 tons of concentrates per month.

Considerable work was carried out both on the surface and underground. The Mill was up and running by the end of 1899, and new tramming levels and tramways connected both mines to the mill. At the peak of operations in 1899 -1900, the mine employed up to 309 people and achieved in 1900 its greatest output of 669 tons of ore.

A plan of the proposed layout of the Brunner Mond Mill together with the Repair Shops at Penyrallt exists. The Mill details confirm more or less to the Mill as constructed, although the actual layout of dressing machinery is slightly different. Immediately to the south of the mill, the location of a proposed Calciner or Spelter is also shown, although this is much fainter. No other reference has been found relating to this structure, but it is known it was constructed. The brick base of a chimney can still be seen as well as the area where a condensing flue was constructed. References up to 1903 refer to Aberllyn ore being sent away to Swansea Spelters. This feature may either have been used for calcining the ore, (though its location for this is unusual) or possibly was a Spelter. It is uncertain whether it actually operated (Fig 8).



Fig 8 Aberllyn Mill: c. 1904.

By 1904 results were disappointing, and operations ceased. Brunner Mond surrendered the lease in 1905 and were given 12 months to clear the site.

Up to 1917 activity at Aberllyn was restricted to occasional operations by small groups of miners. In 1917, Aberllyn Zinc Mines Ltd was registered to take over the lease. Employing over 30 men, the Company constructed a gravity separation plant on the mill site consisting of a rock breaker, several pairs of Cornish Rolls, Hartz Jigs and Wilfley Tables, and was capable of treating three tons of ore per hour. The plant was powered by two pelton wheels and a turbine, supplied with water from Llyn-y-Parc. This was probably only an exercise to show that good ore existed in the mine, and by 1919, Aberllyn had been acquired by a further Company, Aberllyn Ltd.

Aberllyn Ltd., estimated the mine to have a value of £284,888 and the reserves of usable ore in the mine to be 350,000 tons. The Company installed in the mill a flotation separation plant, which by this time was becoming an acceptable and economical ore processing technique. However teething problems frequently arose with the plant at Aberllyn and partly due to inexperience and the complex nature of the Aberllyn ore it never achieved its full potential. The company was also operating on government subsidies provided after the Great War to re-establish British Industry. The cessation of the subsidies in 1920 heralded the closure of Aberllyn, and by 1921, the Aberllyn plant was sold to release assets to invest in foreign mines.

Despite interest being shown in the mine in 1922 by the European Contract Syndicate Ltd and in 1924 by the Derbyshire Mining and Exploration Company Ltd., Aberllyn never re-opened.

7.2 Penyrallt Mine

The area occupied by the Penyrallt Mine in the last century was formerly worked by the Cwmlanerch and Griffin Mines. It was not until the mine developments reached the vicinity of Penyrallt Farm that the mine became known as the Penyrallt Mine.

The earliest reference from 1821 mentions that timber was being purchased for Cwmlanerch Mine. A subsequent reference in 1830 mentions that Owen is the proprietor, employing two men and only raising seven and one half hundredweight of lead ore.

During the 1840s several partnerships were working here but with negligible success. The Messrs. Preston, Lee partnerships who acquired the lease in 1867 were more successful, and by 1869 were employing 18 men under the supervision of a Mine Captain.

A Mr. Ramsden took over in June 1870 and is on record as driving towards the Penyrallt Lode. It is possible that reference to this particular Lode would suggest that Ramsdens operations were located on the back of the Lode towards Penyrallt Farm.

In 1877, proposals were mooted to float the Cwmlanerch Silver Lead Mining Company, but when actually registered one year later, it had become the Griffin Silver Lead Mining Company. The lease the company acquired allowed them to work for mineral on the 57 acres of Cwmlanerch, Griffin and Penyrallt. It would appear however that part of the area now occupied by the Penyrallt Mine had become part of the Aberllyn Lease. Whilst the Griffin Company carried out much of their work on the adit level adjacent to the railway, they did drive four levels on the Penyrallt lode which later became the lowest levels of the Penyrallt Mine. In addition they sank Owens Shaft on the Penyrallt Lode.

When the Griffin Company was formally dissolved in 1887, the mine was dormant until the lease was taken up by Brunner Mond in 1900 and became part of the Brunner Mond operations described under Aberllyn above.

8.0 SUMMARY OF THE MAJOR SURFACE FEATURES (Fig 10 - large plan)

Water for the Brunner Mond Mill was taken from Parc Lake via a pipe line to the Mill turbines. Remains relating to this include a sluice valve (111) and debris screen in the Llyn-y-Parc dam, as well as occasion pieces of pipe and a further valve in the field in front of Aberllyn Cottage (110).

Several buildings remain at the head of Aberllyn Gorge and represent a smithy (102) and store (104).

Behind and adjacent to Aberllyn Cottage lie a several open stopes and shafts which probably represent the earliest workings on the site (outside the present study area).

Descending the Gorge various levels can be seen on the western side (107, 108, 91, 87) and eastern side (92, 88, 84). The area of the No.3 is of particular interest, as there are the remains of a wooden ore chute (85). This may have been associated with the 1877 operations, and would have been used for sliding ore down from the upper levels to the dressing plant located outside the No.3 level. No firm features that relate to the dressing plant are obvious, but their foundations may be revealed by excavation.

The Portal of the No. 6 main tramming level is an obvious feature (75). It is well constructed from both stone and brick. The line of the tramway (73) leading to the Brunner Mond Mill (01 - 62) can then be followed, noting walling at various point along the way.

The Portal of the Valley Cross-Cut cannot be seen having been tipped over with tailings from the Mill (138).

At the top of the Mill are the remains of a large ore bin into which the ore was tipped. Several deep square shafts close by were probably associated with the turbines that powered the mill. The various floors of the mill are obvious features (Fig 9). The large concrete circular depressions on the lower floors once housed circular buddles. In places the floors of the mill exhibit modifications associated with the mining operations that took place in 1920. The two lower floors may have been constructed during the time that oil flotation plant was in use. Very fine spoil adjacent to them could only have resulted from such a process. On the north side of the mill over the stream lie the remains of a series of settling tanks.

Immediately south of the mill lie the Penyrallt workings. The shaft (129) adjacent to Penyrallt Farm has been filled with rubbish, but descending the hillside a series of adits and open stopes are evident (125 - 128).

Adjacent to the remains of the Repair Shop (63 - 64), an elongate building south of, and roughly at the same level as the top of the Mill, can be seen the main tramming adit (62). This is of similar dimensions and construction to the Aberlyn No.6 Level.

On the south side of the Repair Shop lies the collapsed portal of the Old Griffin No.3 Level (65).

Below the Repair Shop lie the remains of the Mine Managers House, which was demolished about 10 years ago for safety reasons (67).

Adjacent to the track below the Mill can be seen the brick base of the Spelter chimney (132). It is understood that it was demolished in the 1920s. The flat area behind the chimney is where the condensing flue was located (134). Further down the track some walling may be the remnants of the Spelter foundations (135).

It is believed that the original turbines may still exist at Cwmlanerch Farm, having become buried by a flash flood that swept down Aberllyn Gorge.



Fig 9 Aberllyn Mill: Location of features 1994

9.0 ADITS AND SHAFTS

Adits are horizontal or inclined tunnels leading from the surface to the mine workings underground. Adits provided access, drainage, ventilation and tramming levels along which ore was removed (see section on mine workings). The portals of the tramming adits are carefully constructed with brick arches and mortared stonework and are generally in good condition. The possibility of tram rails surviving under layers of debris must be bourne in mind when planning remedial works around adits. Adits cut directly into the rock face with no surrounding stonework appear stable. The remaining adits are in various states of collapse and all must be seen as potentially dangerous. In many cases these adits have a collapsed drystone passage or entrance leading up to the mouth.

9.1 List of Adits

- 046 ?ADIT PORTAL WITH TIMBER LINTEL
- 062 ADIT PORTAL (BRUNNER MOND HAULAGE LEVEL)
- 065 ADIT (ROCK CUT) Old Griffin No 3 Level
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 071 SHAFT (INFILLED)
- 075 ADIT PORTAL (Aberllyn No 6 level)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 087 ADIT PORTAL (DRYSTONE)
- 088 ADIT PORTAL
- 091 ADIT PORTAL (COLLAPSED)
- 106 ADIT PORTAL (COLLAPSED)
- 107 ADIT (OPEN)
- 108 ?ADIT/?ORE BIN
- 112 SHAFT (OPEN)
- 114 ADIT (COLLAPSED)
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 118 ADIT (ROCK-CUT, OPEN) Penyrallt No 3 (1902)
- 119 ADIT/SHALLOW TRIAL
- 121 ?ORE BIN/?COLLAPSED ADIT

- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)
- 127 ADIT/TRIAL (ROCK-CUT) Penyrallt No 2C (1902)
- 128 ADIT/STOPE
- 129 SHAFT (OPEN) Penyrallt shaft
- 130 ?ADIT/TRIAL
- 131 ADIT PORTAL Penyrallt No 5 level (1902)
- 138 ADIT (SITE OF) Valley Cross-cut

10.0 SITES OF PARTICULAR INTEREST OR IMPORTANCE

The Aberllyn site can be considered as a single unit on a national or regional scale. The remains are generally well-preserved and demonstrate a entire range of mining features from the adits where ore was brought to surface, along tram ways to the crushing and processing at the mill. The Mill itself has some parallells with the Hafna Mill although the association the spelter plant is unique in the Gwydyr forest.

Individual features of interest include nos 107, 108, 94, 92, 91, 88-90, 84, 85, 81, 75-80, 73, 115, 01-62, 63, 64, 65, 117, 131, 132-134, 136-137.

11.0 SUMMARY LISTS OF SITE CONDITION - ALL SITES

The condition of a feature describes a number of related physical states, of which one or more can apply to an individual feature. The condition of a site reflects processes that have affected the site in the past (e.g. collapse, demolished) and the likely survival of features in the future (buried, infilled, disturbed). The condition of a feature can also help to identify priorities for further recording. The term has been sub-divided into a number of fields, including; materials, no collapse, some collapse, much collapse, buried, partly buried, infilled, partly infilled, disturbed, demolished.

11.1 Site Condition by number of records

- 1. MATERIALS/TIMBERS (39 records)
- 2. NO COLLAPSE (33 records)
- 3. SOME COLLAPSE (59 records)
- 4. MUCH COLLAPSE (18 records)
- 5. BURIED (12 records)
- 6. PARTLY BURIED (43 records)
- 7. INFILLED (13 records)
- 8. PARTLY INFILLED (24 records)
- 9. DISTURBED (19 records)
- 10. PARTLY DEMOLISHED/DEMOLISHED (11/13 records)

11.2 Materials

The type of materials used in construction affects the long-term survival of the structure/s, for instance whilst a drystone revetment is chemically stable, concrete/render will eventually rot, as will timber and iron/metal. Features with a mixture of material types are potentially most at risk because conservation measures for materials differs, for example wood is best preserved in a continually waterlogged environment whilst iron is best preserved in a very dry environment. Iron oxides can also react with wood to speed up the degenerative processes. The presence of *in situ* timber is taken as an indication of good site survival. Timbers can also help put the flesh on the bones of old mine workings and aid presentation. It is important to retain a representative selection of timbers, which can be treated in the short term with an insecticide/fungicide such as Boracol 20. The cost of removing timbers for conservation before replacing them is prohibitive in the context of the reclamation scheme. A policy on treatment of individual features needs to be established on-site. In many cases the best option may be to replace the timbers.

11.2.1 Options

- (1) Do nothing
- (2) Treat with preservative only
- (3) Repair
- (4) Replace
- (5) check condition

11.2.2 Sites with Timber as a component

- 001 MASONRY FOUNDATIONS (option 1)
- 006 REVETMENT/SUB-FLOOR (option 5)
- 008 CONCRETE-LINED STRAIGHT CHUTE (option 4)
- 009 CONCRETE-LINED CURVED CHUTE (option 4)
- 014 BRICK-LINED CHANNEL
- 015 BRICK/CONCRETE BUDDLE PIT (option 4)
- 017 BRICK-LINED CHANNEL (option 4)
- 021 SLOTS/TIMBERS (option 2/4)
- 024 BRICK/CONCRETE BUDDLE PIT
- 025 BRICK-LINED CHANNEL (* good example option 3/4)
- 026 CONCRETE FLOOR (option 1/2)
- 027 BRICK/CONCRETE BUDDLE PIT 028 BRICK/CONCRETE-LINED CHANNEL (option 3/4)
- 034 SLOT FOR WATER CHUTE/LAUNDER (option 2)
- 035 TWO CONCRETE CHUTES AND BEAM SOCKETS (option 2)
- 036 CONCRETE CHUTE/BEAM SOCKETS (option 2)
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS (option 2)

- 046 ?ADIT PORTAL WITH TIMBER LINTEL (option 4 ?grill)
- 058 ORE BIN/?CRUSHER MOUNTS WITH TIMBER CHUTE (option 4)
- 059 ORE CHUTE/SLIDE (option 3/4)
- 060 PRIMARY ORE BIN (option 2)
- 074 TRAMWAY/TIMBERS (AREA ABOVE ORE BIN) (option 2)
- 075 ADIT PORTAL (Aberllyn No 6 level) (option 1)
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE) (option 2/3)
- 085 DRYSTONE BASE WITH TIMBER CHUTE (option 3/4)
- 088 ADIT PORTAL (option 1 or 4)
- 090a TRAMWAY FROM ADIT 88 (option 1)
- 092 ADIT?/STONE STRUCTURE (option 1/2)
- 093 ?BRIDGE/TIMBERS ACROSS STREAM (option 1/2)
- 094 TIMBER RAILS/?PART OF BRIDGE (option 1)
- 099 REVETMENT (option 5)
- 103 DAM (option 2/3)
- 107 ADIT (OPEN) (option 1)
- 111 DAM/SLUICE VALVE (option 1)
- 115 INCLINE/PATH CONNECTING UPPER TRAMWAY TO MILL (option 2/3)
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902) (option 1/2)
- 120 TIMBER SUPPORTS (option 1/2)
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902) (option 1)
- 134 TRAMMING LEVELS/TERRACES (option 1/2)

11.3 No Collapse (33 features)

This indicates a well-preserved site or a site with the occasional loose stone. Sites in this category are generally stable and reasonably solid. There may be some limited conservation measures such as re-pointing necessary. Other works could include the removal of trees. Drystone features are to be re-built without using mortar.

11.3.1 Site List

- 002 BRICK MACHINE MOUNTS
- 003 BRICK PILLAR
- 004 CONCRETE BASE
- 006 REVETMENT/SUB-FLOOR
- 011 UPPER REVETMENT TO SUB-FLOOR
- 015 BRICK/CONCRETE BUDDLE PIT
- 016 BRICK/CONCRETE BUDDLE PIT
- 018 BRICK PARTITIONS/MOUNTS
- 024 BRICK/CONCRETE BUDDLE PIT
- 030 CONCRETE MACHINE MOUNTS
- 032 STONE/CONCRETE BLOCK
- 033 STONE REVETMENT TO N OF MILL
- 035 TWO CONCRETE CHUTES AND BEAM SOCKETS
- 039 CONCRETE MACHINE MOUNTS/TIMBER UPRIGHTS
- 041 THREE CONCRETE JIG BASES
- 043 BRICK/CONCRETE CHANNEL
- 049 LARGE CHUTE (AND SOCKETS)
- 050 IRON GIRDER
- 051 BRICK-ARCHED CULVERTS
- 052 LARGE RECTANGULAR PIT/BIN
- 053 LARGE RECTANGULAR PIT/BIN
- 055 TURBINE PIT
- 056 ORE CHUTE
- 058 ORE BIN/?CRUSHER MOUNTS WITH TIMBER CHUTE

- 059 ORE CHUTE/SLIDE
- 062 ADIT PORTAL (BRUNNER MOND HAULAGE LEVEL)
- 065 ADIT (ROCK CUT) Old Griffin No 3 Level
- 087 ADIT PORTAL (DRYSTONE)
- 088 ADIT PORTAL
- 111 DAM/SLUICE VALVE
- 118 ADIT (ROCK-CUT, OPEN) Penyrallt No 3 (1902)
- 119 ADIT/SHALLOW TRIAL
- 133 TRAMWAY/TRAMMING LEVEL

11.4 Some Collapse (59 features)

This indicates a site that has suffered some collapse although not enough to render the structure in immediate danger of total collapse. Usually the collapses consist of one or two courses of stonework from the top of walls. It may be necessary to replace and consolidate some stonework to prevent further collapse.

11.4.1 Site List

- 001 MASONRY FOUNDATIONS
- 009 CONCRETE-LINED CURVED CHUTE
- 010 SLOTS (TOP OF WALL)
- 017 BRICK-LINED CHANNEL
- 019 NORTH WALL OF FLOOR
- 020 SLOTS TO LOWER FLOOR
- 021 SLOTS/TIMBERS
- 022 STONE-LINED CHUTE
- 023 STONE-LINED CHUTE
- 026 CONCRETE FLOOR
- 028 BRICK/CONCRETE-LINED CHANNEL
- 031 N WALL OF LEVEL 5
- 034 SLOT FOR WATER CHUTE/LAUNDER
- 036 CONCRETE CHUTE/BEAM SOCKETS

- 037 S WALL OF LEVEL 4
- 045 WALL AT N END OF FLOOR
- 047 DRYSTONE REVETMENT
- 048 LARGE CHUTE (AND SOCKETS)
- 054 FIVE BRICK MACHINE MOUNTS
- 056 ORE CHUTE
- 063 REPAIR SHOP (WALLS)
- 064 REPAIR SHOP (FOUNDATIONS)
- 069 ADIT (COLLAPSED)
- 070 TRAMWAY/?LEAT
- 072 REVETMENT/YARD AT S END OF TRAMWAY 73
- 073 TRAMWAY (FROM No 6 ADIT)
- 074 TRAMWAY/TIMBERS (AREA ABOVE ORE BIN)
- 075 ADIT PORTAL (Aberllyn No 6 level)
- 076 STONE-FACED RAMP/INCLINE
- 078 REVETMENT/STRUCTURE
- 079 ORE BIN
- 080 LENGTH OF DRYSTONE WALL
- 081 DRYSTONE STRUCTURE
- 083 TRAMWAY (UPPER)
- 085 DRYSTONE BASE WITH TIMBER CHUTE
- 089 REVETMENT (PARTLY COLLAPSED)
- 091 ADIT PORTAL (COLLAPSED)
- 092 ADIT?/STONE STRUCTURE
- 094 TIMBER RAILS/?PART OF BRIDGE
- 095 REVETMENT
- 096 REVETMENT
- 099 REVETMENT
- 100 REVETMENT

- 101 SPOIL TIP
- 102 BUILDING SMITHY/STORE
- 103 DAM
- 104 BUILDING OFFICE/STORE
- 105 REVETMENT
- 107 ADIT (OPEN)
- 112 SHAFT (OPEN)
- 115 INCLINE/PATH CONNECTING UPPER TRAMWAY TO MILL
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 117 TRAM/BARROW WAY (REVETTED)
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)
- 131 ADIT PORTAL Penyrallt No 5 level (1902)
- 132 CHIMNEY BASE
- 134 TRAMMING LEVELS/TERRACES
- 135 STONE FACED RAMP

11.5 Much Collapse (18 features)

This indicates features that are almost entirely collapsed (see also demolished) or that have been substantially buried by collapse. The category also includes features that have small amounts of significant collapse that could lead directly to further collapse. Response to a much collapsed feature could include clearing and replacing stonework to prevent further collapse, or complete re-building in rare cases. The stability of the site is important when considering further action, as a site may have completely collapsed and therefore be stable.

11.5.1 Site List

- 005 WALL FOUNDATION/DRAIN
- 009 CONCRETE-LINED CURVED CHUTE
- 017 BRICK-LINED CHANNEL
- 025 BRICK-LINED CHANNEL
- 046 ?ADIT PORTAL WITH TIMBER LINTEL
- 060 PRIMARY ORE BIN

- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 090 SPOIL TIP (FROM ADIT 88)
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 106 ADIT PORTAL (COLLAPSED)
- 108 ?ADIT/?ORE BIN
- 109 SPOIL TIP
- 121 ?ORE BIN/?COLLAPSED ADIT
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 130 ?ADIT/TRIAL

11.6 Buried (12 features)

This indicates features that are mostly or entirely buried, usually by collapse or spoil, with few features visible on the surface. Buried features are likely to be well-preserved in comparison with exposed features, especially comparatively delicate features such as wooden launders. Artefacts such as miners boots, leather items and tin cans have occasionally been found on other mine sites in the Gwydyr Forest, for example the Hafna smelter house.

The normal response for buried features is to leave them buried unless there is an argued case for excavation, for example to reveal important features which would aid interpretation or provide a more comprehensive display for presentation to the public.

11.6.1 Site List

- 029 BRICK/CONCRETE BUDDLE PIT (PART OF)
- 038 MOUND/?COLLAPSED STRUCTURE
- 061 DEMOLISHED/BURIED STRUCTURE
- 066 RUBBLE/COLLAPSE (SITE OF BUILDING)
- 067 MINE OFFICE (SITE OF)
- 082 IRON PIPE/S
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 090a TRAMWAY FROM ADIT 88

106 ADIT PORTAL (COLLAPSED)

120 TIMBER SUPPORTS

124 ?LINE OF INCLINE FROM 123

130 ?ADIT/TRIAL

11.7 Partly Buried (43 features)

Partly buried sites include those where features are partially exposed, and typically include building floors, dressing floors, yards and tramways. In many cases there may be a stronger argument for clearance and recording than on wholly buried sites because features are likely to be under threat from differential weathering or destruction. Sites also include those buried under relatively thin deposits of processing waste, which could be easily cleared to reveal features.

11.7.1 Site List

- 001 MASONRY FOUNDATIONS
- 006 REVETMENT/SUB-FLOOR
- 026 CONCRETE FLOOR
- 027 BRICK/CONCRETE BUDDLE PIT
- 031 N WALL OF LEVEL 5
- 033 STONE REVETMENT TO N OF MILL
- 037 S WALL OF LEVEL 4
- 040 TWO CONCRETE JIG BASES
- 042 BRICK/CONCRETE CHANNEL SYSTEM
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS
- 046 ?ADIT PORTAL WITH TIMBER LINTEL
- 048 LARGE CHUTE (AND SOCKETS)
- 052 LARGE RECTANGULAR PIT/BIN
- 054 FIVE BRICK MACHINE MOUNTS
- 058 ORE BIN/?CRUSHER MOUNTS WITH TIMBER CHUTE
- 060 PRIMARY ORE BIN
- 063 REPAIR SHOP (WALLS)
- 072 REVETMENT/YARD AT S END OF TRAMWAY 73

- 073 TRAMWAY (FROM No 6 ADIT)
- 074 TRAMWAY/TIMBERS (AREA ABOVE ORE BIN)
- 075 ADIT PORTAL (Aberllyn No 6 level)
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 080 LENGTH OF DRYSTONE WALL
- 085 DRYSTONE BASE WITH TIMBER CHUTE
- 092 ADIT?/STONE STRUCTURE
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 097 TRACK/TRAMWAY
- 098 TRACKWAY?
- 099 REVETMENT
- 101 SPOIL TIP
- 102 BUILDING SMITHY/STORE
- 104 BUILDING OFFICE/STORE
- 110 IRON SLUICE VALVE
- 113 OPEN STOPE/?QUARRY
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 121 ?ORE BIN/?COLLAPSED ADIT
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)
- 131 ADIT PORTAL Penyrallt No 5 level (1902)
- 132 CHIMNEY BASE
- 133 TRAMWAY/TRAMMING LEVEL
- 134 TRAMMING LEVELS/TERRACES

11.8 Infilled (13 records)

Infilled sites differ from buried sites in that they are generally negative features such as shafts, adits or wheel pits that have been deliberately backfilled or collapsed. As negative features of frequently uncertain stability and depth they present a range of problems from health and safety requirements to practical problems with recording before and during any remedial works. It is

likely that less information is recoverable compared to buried sites.

11.8.1 Site List

- 007 ?BLOCKED OPENING/LINTEL
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 071 SHAFT (INFILLED)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 087 ADIT PORTAL (DRYSTONE)
- 091 ADIT PORTAL (COLLAPSED)
- 106 ADIT PORTAL (COLLAPSED)
- 108 ?ADIT/?ORE BIN
- 114 ADIT (COLLAPSED)
- 127 ADIT/TRIAL (ROCK-CUT) Penyrallt No 2C (1902)
- 130 ?ADIT/TRIAL
- 136 SETTLING TANKS

11.9 Partly Infilled (24 features)

Partly infilled sites such as wheel pits present better opportunities for clearance work, especially if the sites are to be presented to the public. Some of the infilled sites have Sea Campion growing on the infilling material, which renders them unsuitable for clearance (see list of SSSI plants).

11.9.1 Site List

- 013 BRICK/CONCRETE BUDDLE PIT
- 014 BRICK-LINED CHANNEL
- 016 BRICK/CONCRETE BUDDLE PIT
- 017 BRICK-LINED CHANNEL
- 022 STONE-LINED CHUTE
- 024 BRICK/CONCRETE BUDDLE PIT
- 025 BRICK-LINED CHANNEL
- 028 BRICK/CONCRETE-LINED CHANNEL

- 034 SLOT FOR WATER CHUTE/LAUNDER
- 035 TWO CONCRETE CHUTES AND BEAM SOCKETS
- 043 BRICK/CONCRETE CHANNEL
- 053 LARGE RECTANGULAR PIT/BIN

059 ORE CHUTE/SLIDE

- 065 ADIT (ROCK CUT) Old Griffin No 3 Level
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 070 TRAMWAY/?LEAT
- 078 REVETMENT/STRUCTURE
- 079 ORE BIN
- 088 ADIT PORTAL
- 107 ADIT (OPEN)
- 115 INCLINE/PATH CONNECTING UPPER TRAMWAY TO MILL
- 129 SHAFT (OPEN) Penyrallt shaft
- 136 SETTLING TANKS

11.10 Disturbed (19 features)

This relates mainly to sites under direct threat from tree growth.

11.10.1 Site List

- 008 CONCRETE-LINED STRAIGHT CHUTE
- 009 CONCRETE-LINED CURVED CHUTE
- 014 BRICK-LINED CHANNEL
- 017 BRICK-LINED CHANNEL
- 025 BRICK-LINED CHANNEL
- 028 BRICK/CONCRETE-LINED CHANNEL
- 029 BRICK/CONCRETE BUDDLE PIT (PART OF)
- 057 WALL SOCKETS

- 060 PRIMARY ORE BIN
- 063 REPAIR SHOP (WALLS)
- 073 TRAMWAY (FROM No 6 ADIT)
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 083 TRAMWAY (UPPER)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 086 ?INCLINE/TRAMWAY FOUNDATIONS ON PATH
- 090 SPOIL TIP (FROM ADIT 88)
- 094 TIMBER RAILS/?PART OF BRIDGE
- 111 DAM/SLUICE VALVE
- 117 TRAM/BARROW WAY (REVETTED)

11.11 Partly Demolished (11 features) and Demolished (3 features)

Some sites have been demolished in the last few decades for safety reasons, for example the mine office 067 (demolished) and the office/store 104 (partly demolished). Others were probably partly demolished when the mine closed down, either deliberately or incidentally during the removal of machinery etc. The reasons for and method of demolition will affect the survival and condition of features under the demolition layer. Many of the sites can be considered along the same lines as partly buried and buried sites.

11.11.1 Partly Demolished - Site List

- 005 WALL FOUNDATION/DRAIN
- 019 NORTH WALL OF FLOOR
- 057 WALL SOCKETS
- 063 REPAIR SHOP (WALLS)
- 064 REPAIR SHOP (FOUNDATIONS)
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 102 BUILDING SMITHY/STORE
- 104 BUILDING OFFICE/STORE
- 132 CHIMNEY BASE
- 135 STONE FACED RAMP

137 SETTLING TANK

11.11.2 Demolished - Site List

- 038 MOUND/?COLLAPSED STRUCTURE
- 066 RUBBLE/COLLAPSE (SITE OF BUILDING)
- 067 MINE OFFICE (SITE OF)

12.0 PRIORITIES FOR RECORDING AND CONSERVATION

- 1. UNSTABLE SITES (32 records)
- 2. VERY FRAGILE SITES (15 records)

12.1 Unstable Features (32)

The stability of a site as defined here is a judgment based on a visual inspection of the site as to whether it appears likely to collapse or alter its physical form in the next decade or so. Included in the list are sites with collapsing walls, adits and shafts, delicately balanced or rotting timbers and unvegetated spoil tips. The sites are high priorities for recording and remedial works, including consolidation and re-construction. Some of the sites are highly dangerous and pose particular problems for investigation and recording.

12.1.1 Site List

- 009 CONCRETE-LINED CURVED CHUTE
- 017 BRICK-LINED CHANNEL
- 025 BRICK-LINED CHANNEL
- 034 SLOT FOR WATER CHUTE/LAUNDER
- 046 ?ADIT PORTAL WITH TIMBER LINTEL
- 047 DRYSTONE REVETMENT
- 054 FIVE BRICK MACHINE MOUNTS
- 060 PRIMARY ORE BIN
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 071 SHAFT (INFILLED)

- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 081 DRYSTONE STRUCTURE
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 085 DRYSTONE BASE WITH TIMBER CHUTE
- 089 REVETMENT (PARTLY COLLAPSED)
- 090 SPOIL TIP (FROM ADIT 88)
- 094 TIMBER RAILS/?PART OF BRIDGE
- 099 REVETMENT
- 101 SPOIL TIP
- 105 REVETMENT
- 106 ADIT PORTAL (COLLAPSED)
- 107 ADIT (OPEN)
- 108 ?ADIT/?ORE BIN
- 109 SPOIL TIP
- 112 SHAFT (OPEN)
- 114 ADIT (COLLAPSED)
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 122 SPOIL TIP
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)
- 131 ADIT PORTAL Penyrallt No 5 level (1902)

12.2 Very Fragile (15)

Fragility in the sense used here relates to the susceptibility of the sites to disturbance and the potential for irretrievably losing information. Therefore it is not just the physical delicacy of the sites that is being assessed but also their archaeological value. Most archaeological sites are fragile by nature and it is only the 'very fragile' features that are listed here.

These sites are also high priorities for recording although remedial works are not always necessary or possible.

Sites which are on the list as 'unstable' are not repeated.

12.2.1 Site List

- 014 BRICK-LINED CHANNEL
- 020 SLOTS TO LOWER FLOOR
- 021 SLOTS/TIMBERS
- 024 BRICK/CONCRETE BUDDLE PIT
- 027 BRICK/CONCRETE BUDDLE PIT
- 028 BRICK/CONCRETE-LINED CHANNEL
- 035 TWO CONCRETE CHUTES AND BEAM SOCKETS
- 057 WALL SOCKETS
- 088 ADIT PORTAL
- 091 ADIT PORTAL (COLLAPSED)
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 120 TIMBER SUPPORTS
- 121 ?ORE BIN/?COLLAPSED ADIT
- 129 SHAFT (OPEN) Penyrallt shaft
- 136 SETTLING TANKS

13.0 POTENTIAL CLEARANCE OF VEGETATION - SITE LIST

- 13.3 SAPLINGS/TREES (56)
- 13.4 MATURE TREES (24)
- 13.5 DEAD OR FALLEN TREES (16)
- 13.6 LOW UNDERGROWTH (21)
- 13.7 SSSI PLANTS NOT TO CLEAR (7)

13.1 Affects of Vegetation

The type and density of vegetation on or around features has two main affects:

13.1.1 Obscuring features (undergrowth, ivy, saplings)

Features are often hidden in undergrowth such as bracken, brambles and heather, making them difficult to initially identify and impossible to survey or photograph. In many cases the problem is lessened in the winter months. Ivy can completely cover walls and revetments, often hiding significant details connected with operation or phasing. There are also practical difficulties with elevation drawing and photography.

All sites with low undergrowth or dense sapling growth have the potential of producing more information simply by being cleared. The sites would also become more presentable to the public. There may be a problem maintaining any clearances in the long term. The exact areas and species to be cleared would need to be identified both on plan and on the ground.

13.1.2 Destruction of features (saplings, trees, fallen trees)

Tree growth is the main cause of destruction of archaeological features on site. A number of features have been identified that are being directly affected by trees.

The main affects are;

1) Dislodging of stones and disturbance of features through expanding root growth.

2) Collapsing of walls by falling branches and trunks.

3) Destruction of sub-surface archaeology by up-ended tree roots.

The problem of tree growth can be easily appreciated on the mill site, particularly above the chute 09 or in channel 025.

13.2 Recommendations

To ensure the future preservation of archaeological features on the Aberllyn Mine, it is recommended that all sites with saplings, mature trees and fallen trees be cleared and maintained.

Saplings have been included in the recommendations for clearance because of the high number of occurances (compared with mature trees) and the potential future destruction.

The exact areas and species to be cleared would need to be identified both on plan and on the ground with relevant parties.

It is recommended that spoil tips are left vegetated where possible to aid stabilisation and they do not appear in the lists.

Features being actively eroded by root growth need to be recorded before clearance as they will inevitably be partly destroyed during removal. Features under direct threat are noted below.

Sites with both saplings and mature trees appear on both lists. Sites with undergrowth are only listed if they do not appear on the sapling or mature tree list.

13.3 Sites with Potential for Clearance of Saplings/Young Trees(56)

- 002 BRICK MACHINE MOUNTS
- 014 BRICK-LINED CHANNEL
- 016 BRICK/CONCRETE BUDDLE PIT
- 025 BRICK-LINED CHANNEL

- 036 CONCRETE CHUTE/BEAM SOCKETS
- 040 TWO CONCRETE JIG BASES
- 041 THREE CONCRETE JIG BASES
- 042 BRICK/CONCRETE CHANNEL SYSTEM
- 043 BRICK/CONCRETE CHANNEL
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS
- 045 WALL AT N END OF FLOOR
- 052 LARGE RECTANGULAR PIT/BIN
- 053 LARGE RECTANGULAR PIT/BIN
- 055 TURBINE PIT
- 056 ORE CHUTE
- 058 ORE BIN/?CRUSHER MOUNTS WITH TIMBER CHUTE
- 059 ORE CHUTE/SLIDE
- 060 PRIMARY ORE BIN
- 061 DEMOLISHED/BURIED STRUCTURE
- 063 REPAIR SHOP (WALLS)
- 064 REPAIR SHOP (FOUNDATIONS)
- 066 RUBBLE/COLLAPSE (SITE OF BUILDING)
- 069 ADIT (COLLAPSED)
- 070 TRAMWAY/?LEAT
- 071 SHAFT (INFILLED)
- 072 REVETMENT/YARD AT S END OF TRAMWAY 73
- 073 TRAMWAY (FROM No 6 ADIT)
- 074 TRAMWAY/TIMBERS (AREA ABOVE ORE BIN)
- 075 ADIT PORTAL (Aberllyn No 6 level)
- 076 STONE-FACED RAMP/INCLINE
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 078 REVETMENT/STRUCTURE
- 081 DRYSTONE STRUCTURE

- 083 TRAMWAY (UPPER)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 087 ADIT PORTAL (DRYSTONE)
- 092 ADIT?/STONE STRUCTURE
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 094 TIMBER RAILS/?PART OF BRIDGE
- 095 REVETMENT
- 096 REVETMENT
- 098 TRACKWAY?
- 099 REVETMENT
- 102 BUILDING SMITHY/STORE
- 113 OPEN STOPE/?QUARRY
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 117 TRAM/BARROW WAY (REVETTED)
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 130 ?ADIT/TRIAL
- 131 ADIT PORTAL Penyrallt No 5 level (1902)
- 133 TRAMWAY/TRAMMING LEVEL
- 134 TRAMMING LEVELS/TERRACES
- 135 STONE FACED RAMP
- 136 SETTLING TANKS
- 137 SETTLING TANK
- 13.4 Sites with Potential for Clearance of Mature Trees (24)
- 006 REVETMENT/SUB-FLOOR
- 009 CONCRETE-LINED CURVED CHUTE (directly affected)
- 017 BRICK-LINED CHANNEL (directly affected)
- 025 BRICK-LINED CHANNEL (directly affected)

- 052 LARGE RECTANGULAR PIT/BIN
- 053 LARGE RECTANGULAR PIT/BIN
- 056 ORE CHUTE
- 058 ORE BIN/?CRUSHER MOUNTS WITH TIMBER CHUTE (directly affected)
- 059 ORE CHUTE/SLIDE (directly affected)
- 060 PRIMARY ORE BIN
- 063 REPAIR SHOP (WALLS) (directly affected)
- 071 SHAFT (INFILLED)
- 072 REVETMENT/YARD AT S END OF TRAMWAY 73
- 074 TRAMWAY/TIMBERS (AREA ABOVE ORE BIN) (directly affected)
- 091 ADIT PORTAL (COLLAPSED)
- 094 TIMBER RAILS/?PART OF BRIDGE (directly affected)
- 096 REVETMENT
- 098 TRACKWAY?
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 132 CHIMNEY BASE (directly affected)
- 133 TRAMWAY/TRAMMING LEVEL
- 134 TRAMMING LEVELS/TERRACES
- 136 SETTLING TANKS (directly affected)
- 13.5 Sites with Potential For Clearance of Dead or Fallen Trees (16)
- 037 S WALL OF LEVEL 4
- 052 LARGE RECTANGULAR PIT/BIN
- 054 FIVE BRICK MACHINE MOUNTS
- 063 REPAIR SHOP (WALLS)
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 072 REVETMENT/YARD AT S END OF TRAMWAY 73
- 073 TRAMWAY (FROM No 6 ADIT)

- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 079 ORE BIN
- 087 ADIT PORTAL (DRYSTONE)
- 088 ADIT PORTAL
- 115 INCLINE/PATH CONNECTING UPPER TRAMWAY TO MILL
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 131 ADIT PORTAL Penyrallt No 5 level (1902)

13.6 Sites with Potential for Clearance of Low Undergrowth (21)

Sites listed under saplings or mature trees are not repeated.

- 003 BRICK PILLAR
- 034 SLOT FOR WATER CHUTE/LAUNDER
- 038 MOUND/?COLLAPSED STRUCTURE
- 061 DEMOLISHED/BURIED STRUCTURE
- 066 RUBBLE/COLLAPSE (SITE OF BUILDING)
- 083 TRAMWAY (UPPER)
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 087 ADIT PORTAL (DRYSTONE)
- 088 ADIT PORTAL
- 095 REVETMENT
- 096 REVETMENT
- 099 REVETMENT
- 102 BUILDING SMITHY/STORE
- 104 BUILDING OFFICE/STORE
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 123 ROCK CUT ADIT/OPEN STOPE (Penyrallt No 2 (1902)
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)

127 ADIT/TRIAL (ROCK-CUT) - Penyrallt No 2C (1902)

131 ADIT PORTAL - Penyrallt No 5 level (1902)

13.7 Sites with SSSI Plants (7)

The mill building and the gorge area both have SSSI plants growing on or near archaeological features. The following is a provisional list of sites with Sea Campion.

- 031 N WALL OF LEVEL 5
- 035 TWO CONCRETE CHUTES AND BEAM SOCKETS
- 040 TWO CONCRETE JIG BASES
- 042 BRICK/CONCRETE CHANNEL SYSTEM
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS
- 090 SPOIL TIP (FROM ADIT 88)
- 092 ADIT?/STONE STRUCTURE

14.0 POTENTIAL EXCAVATION AND CLEARANCE - SITE LIST

- 1. COLLAPSE/RUBBLE (26)
- 2. MIXED MATERIAL (28)
- 3. COARSE SPOIL (5)
- 4. FINE SPOIL (3)

14.1 Sites with Potential for Clearance of Collapse/Rubble (26)

The following is a list of sites that have been identified as being possible candidates for partial excavation. Excavation in this sense means clearing rubble and spoil to reveal the latest phase of construction. The sites would then be recorded and conserved for display. In some cases features would be re-buried.

14.1.1 Site List

- 001 MASONRY FOUNDATIONS
- 025 BRICK-LINED CHANNEL
- 027 BRICK/CONCRETE BUDDLE PIT
- 031 N WALL OF LEVEL 5
- 075 ADIT PORTAL (Aberllyn No 6 level)
- 076 STONE-FACED RAMP/INCLINE
- 078 REVETMENT/STRUCTURE

- 079 ORE BIN
- 080 LENGTH OF DRYSTONE WALL
- 084 ?ADIT (COLLAPSED)/?LOADING BAY
- 089 REVETMENT (PARTLY COLLAPSED)
- 090a TRAMWAY FROM ADIT 88
- 091 ADIT PORTAL (COLLAPSED)
- 093 ?BRIDGE/TIMBERS ACROSS STREAM
- 102 BUILDING SMITHY/STORE
- 104 BUILDING OFFICE/STORE
- 106 ADIT PORTAL (COLLAPSED)
- 107 ADIT (OPEN)
- 108 ?ADIT/?ORE BIN
- 114 ADIT (COLLAPSED)
- 115 INCLINE/PATH CONNECTING UPPER TRAMWAY TO MILL
- 121 ?ORE BIN/?COLLAPSED ADIT
- 124 ?LINE OF INCLINE FROM 123
- 125 ADIT (OVERGROWN) AND SPOIL TIPS Penyrallt No 1 (1902)
- 126 ADIT (COLLAPSED) Penyrallt No 2b (1902)
- 127 ADIT/TRIAL (ROCK-CUT) Penyrallt No 2C (1902)

14.2 Sites with Potential for Clearance of Mixed Material (28)

14.2.1 Site List

- 002 BRICK MACHINE MOUNTS
- 010 SLOTS (TOP OF WALL)
- 021 SLOTS/TIMBERS
- 024 BRICK/CONCRETE BUDDLE PIT
- 026 CONCRETE FLOOR
- 028 BRICK/CONCRETE-LINED CHANNEL

- 029 BRICK/CONCRETE BUDDLE PIT (PART OF)
- 038 MOUND/?COLLAPSED STRUCTURE
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS
- 052 LARGE RECTANGULAR PIT/BIN
- 060 PRIMARY ORE BIN
- 061 DEMOLISHED/BURIED STRUCTURE
- 063 REPAIR SHOP (WALLS)
- 066 RUBBLE/COLLAPSE (SITE OF BUILDING)
- 067 MINE OFFICE (SITE OF)
- 068 ADIT/?CULVERT (COLLAPSED)
- 069 ADIT (COLLAPSED)
- 077 PLANK FLOORING AND SUPPORTS (ORE CHUTE)
- 083 TRAMWAY (UPPER)
- 085 DRYSTONE BASE WITH TIMBER CHUTE
- 088 ADIT PORTAL
- 094 TIMBER RAILS/?PART OF BRIDGE
- 110 IRON SLUICE VALVE
- 116 ADIT (ROCK-CUT, OPEN) Penyrallt No 3a (1902)
- 120 TIMBER SUPPORTS
- 129 SHAFT (OPEN) Penyrallt shaft
- 131 ADIT PORTAL Penyrallt No 5 level (1902)
- 132 CHIMNEY BASE
- 14.3 Sites with Potential for Clearance of Coarse Spoil (5)

14.3.1 Site List

- 090a TRAMWAY FROM ADIT 88
- 120 TIMBER SUPPORTS
- 121 ?ORE BIN/?COLLAPSED ADIT

124 ?LINE OF INCLINE FROM 123

130 ?ADIT/TRIAL

14.4 Sites With Potential For Clearance of Fine Spoil (3)

Features with a covering of fine spoil can present health and safety problems and excavation can only proceed with information on levels of toxicity and relevant safety precautions.

14.4.1 Site List

- 013 BRICK/CONCRETE BUDDLE PIT
- 026 CONCRETE FLOOR
- 044 CONCRETE FLOOR/MOUNTS/TIMBERS

15.0 SUMMARY OF RECOMMENDATIONS

The detailed site survey recorded around 140 archaeological features within the site boundary, all of which are connected with mining activity dating from the nineteenth and early twentieth centuries.

The bulk of the surface remains are from the period between 1894 and 1900 when the mine was owned by Brunner Mond. There are traces of features from the earlier phases.

The archaeological recommendations for individual features have been presented as a series of lists, forming 4 stages of work;

- 1. Vegetation clearance
- 2. Excavation or clearance of collapse
- 3. Detailed recording
- 4. Conservation/consolidation

Further recommendations may be put forward during the detailed design of the project, and further modifications will be inevitable as the scheme progresses.

16.0 METHODOLOGY FOR FUTURE WORK

1. A detailed survey is needed of the site at a working scale of 1:500 before recording work can proceed further. A certain amount of tree clearance will be needed before survey can proceed. All clearance is to be carried out under supervision.

2. Areas of very fragile features to be identified on the ground with high visibility tape.

3. All structures to be recorded by drawings, written description and photographs before works. Drawings to include plans, elevations, profiles and contour plans. A guide plan for contractors to be produced for re-building of features.

4. All replaced stones to be drilled with a 10mm drill bit to a depth of 10mm. Only stones around the edge and base of the repair need to be identified. This is in line with Cadw procedure.

5. A full schedule of remedial works is needed in order to plan clearance and recording.

6. General procedure for on-site work:

a. Site visit/liaison with ecologists, engineers, contractors to discuss work and to mark features on plan and on the ground.

b. Remove vegetation

c. Record (photograph, plan, describe)

d. Assess remains/advise contractor

- e. Clearance/excavation (followed by recording, artefact removal)
- f. either: i. conservation (for display)

ii. re-burial

7. A watching brief is to be maintained on all shafts and adits and other sites during investigation and remedial works.

