Slate Industry of North Wales

Scheduling Recommendations: A pilot study

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Slate Industry of North Wales: World Heritage Site Nomination

Scheduling Recommendations: A Pilot Study

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SLATE INDUSTRY OF NORTH WALES - WORLD HERITAGE SITE NOMINATION.

SCHEDULING RECOMMENDATIONS – A PILOT STUDY (G2398)

1. INTRODUCTION

Gwynedd Council has produced a bid to have the slate industry of North Wales inscribed as a World Heritage Site. This document examines the potential for enhancing the management of the physical remains of the industry through scheduling. Current evidence suggests that the archaeological remains of the slate industry are under-represented on the schedule of ancient monuments. The criteria used to identify sites of national significance are examined in relation to slate quarrying remains, and their relationship with criteria used to establish Outstanding Universal Value is discussed. The criteria for scheduling are tested against an area of slate quarrying in Blaenau Ffestiniog. The criteria for scheduling slate quarry tips as ancient monuments have been examined by David Gwyn (2015), and the discussion and conclusions in that document should also be read in conjunction with this document. Reference is also made to the surveys undertaken by Gwynedd Archaeological Trust in the mid-1990's (GAT Reports 154 and 252).

2. CURRENT LEGISLATION AND GUIDELINES IN WALES

The protection of ancient monuments and archaeological remains of national importance in Wales is governed by the Ancient Monuments and Archaeological Areas Act 1979. The Act provides the legislative framework for the protection of ancient monuments, supported by guidance in Welsh Office Circular 60/96.

The circular includes The Secretary of State's criteria for scheduling ancient monuments (Annexe 3) as follows:

> 'The following criteria (which are not in any order of ranking) are used for assessing the national [i.e. Welsh] importance of an ancient monument and considering whether scheduling is appropriate. The criteria should not however be regarded as definitive; rather they are indicators which contribute to a wider judgement based on the individual circumstances of a case.
> **(i) Period**: All types of monuments that characterize a category or period should be considered for preservation.
> **(ii) Rarity**: There are some monument categories which in certain periods are so scarce that all surviving examples which still retain some archaeological potential should be preserved. In general, however, a selection must be made which portrays the typical and commonplace as well as the rare. This process should take account of all aspects of the distribution of a particular class of monument, both in a national and a regional context.
> **(iii) Documentation**: The significance of a monument may be enhanced by the existence of records of previous investigation or, in the case of more recent monuments, by the supporting evidence of contemporary written records.
> **(iv) Group value**: The value of a single monument (such as a field system) may be greatly enhanced by its association with related contemporary monuments (such as a settlement and cemetery) or with monuments of different periods. In some cases, it is preferable to protect the complete group of monuments, including associated and adjacent land, rather than to protect isolated monuments within the group.
> **(v) Survival/condition**: The survival of a monument's archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features.

(vi) Fragility/vulnerability: Highly important archaeological evidence from some field monuments can be destroyed by a single ploughing or unsympathetic treatment. Vulnerable monuments of this nature would particularly benefit from the statutory protection which scheduling confers. There are also existing standing structures of particular form or complexity whose value can again be severely reduced by neglect or careless treatment and which are similarly well suited by scheduled monument protection, even if these structures are already listed historic buildings.

(vii) Diversity: Some monuments may be selected for scheduling because they possess a combination of high quality features, others because of a single important attribute.

(viii) Potential: On occasion, the nature of the evidence cannot be specified precisely, but it may still be possible to document reasons anticipating its existence and importance and so to demonstrate the justification for scheduling. This is usually confined to sites rather than upstanding monuments.'

These criteria form the basis of scheduling recommendations although they are increasingly also used in the context of the wider judgment of the site.

3. LEGISLATION AND GUIDANCE IN ENGLAND

In England the assessment of the historic environment has been refined and widened with the *significance* of an asset or place being one of the main criteria used to determine the level of statutory protection of the site. Cadw adopted these principles and stated:

> English Heritage's *Conservation Principles, Policies and Guidance* (2008) described in detail the family of heritage values and provides an extended explanation on assessing heritage significance. Cadw sees no reason to differ from this set of heritage values (Cadw 2011 Conservation Principles 16).

A series of conservation principles are set out (in EH 2008). Principle 3 states:

> Understanding the significance of places is vital.
>
> 3.1 Any fixed part of the historic environment with a distinctive identity perceived by people can be considered a place.
>
> 3.2 The significance of a place embraces all the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it. These values tend to grow in strength and complexity over time, as understanding deepens and people's perceptions of a place evolve.
>
> 3.3 In order to identify the significance of a place, it is necessary first to understand its fabric, and how and why it has changed over time; and then to consider:
>
> • who values the place, and why they do so
> • how those values relate to its fabric
> • their relative importance
> • whether associated objects contribute to them
> • the contribution made by the setting and context of the place
> • how the place compares with others sharing similar values.
>
> 3.4 Understanding and articulating the values and significance of a place is necessary to inform decisions about its future. The degree of significance determines what, if any, protection, including statutory designation, is appropriate under law and policy

These policies and guidance serve to illustrate the move towards a more holistic approach to heritage assessment and management.

4. ASSESSMENT CRITERIA IN PRACTICE

The process of scheduling is undertaken by Cadw, who are the advisors on the historic environment to the Welsh Government. They are able to fund programmes of work with the aim of identifying sites which meet the criteria for scheduling, and over the past 20 years have followed a strategy for funding national thematic assessments, often undertaken by the Welsh Archaeological Trusts, which meet this aim.

Whilst there were minor variations in the assessment methodology depending on the monument type, assessments were typically undertaken in a consistent manner across the country and across site types. When large numbers of sites were to be assessed the scheduling criteria were scored, usually within a 1-3 range, and the sum used as an indication of the overall value of a site. This was used to produce a generalised assessment of the sites in the field. A secondary written assessment was produced by examining the relative importance of the criteria in relation to individual sites. Application of the criteria required careful consideration and judgement, and the need to balance all factors. A high score for rarity might be significant in one case, whilst a low score in another might be balanced by the excellent survival of a single feature.

In some cases additional criteria were applied in order to aid assessment of a particular site-type. The 1994-5 assessment of Gwynedd slate quarries, in addition to assessing individual features within each quarry, added *amenity value* and *visual amenity* as assessment criteria for each entire quarry. Inclusion of these criteria did not, however, lead to the scheduling of significantly larger areas.

The approach to scheduling in the 1990's, and until recently, has typically involved the scheduling of individual features, with the assumption that this would preserve the areas between. The scheduling that resulted from the 1990s Gwynedd Slate Quarries Project reflects this with individual features scheduled in small discrete areas at both Dinorwic and Dorothea, representing only a small percentage of the overall area of the quarries.

More recent scheduling initiatives involving, for example, Roman fort environs or early field systems, have emphasised the importance of the wider landscape, and scheduling areas have increased in size. An example of this in an industrial context is the recent scheduling of the Gorsedda Slate Quarry, adjacent settlement, exit tramway and mill, an area totalling 17.5 hectares.

This approach is particularly applicable to slate quarries, where features combine to form an integrated whole. Individual elements or features are less significant if the other features which once formed part of the related production process are removed. Group Value is therefore of particular relevance in this context.

5. UNESCO REQUIREMENTS AND THE SLATE INDUSTRY OF NORTH WALES

Operational Guidelines for the Implementation of the World Heritage Convention (WHC, 13/01 July 2013) Paragraph 98 states:

> 'Legislative and regulatory measures at national and local levels should assure the survival of the property and its protection against development and change that might negatively impact the Outstanding Universal Value, or the integrity and/or authenticity of the property. States Parties should also assure the full and effective implementation of such measures.'

It is understood that this means that an inscribed property should be afforded the highest level of statutory protection that the jurisdiction permits.

Scheduling is only one means of managing and protecting a site, and when considering appropriate site management it is necessary to examine all potential means of designation which could be of benefit. Welsh Government are required to compile lists of buildings of special architectural or historic interest, and these lists are used to help Local Authorities and Welsh Government make appropriate decisions for the management of the historic environment. Listed Buildings are graded in importance in three grades: I, II* and II. The criteria used to assess significance include architectural interest, historic interest, historical association and group value.

Other non-statutory heritage designations include registered Historic Landscapes of outstanding or special historic interest in Wales, which includes parks and gardens as a distinct category. Criteria for assessing the significance of these sites is similar to that used for Listed Buildings.

There are many other area designations which, though not always primarily aimed at managing the historic environment, can have a positive impact on their management. These include national parks, areas of outstanding natural beauty, conservation areas, sites of special scientific interest, special areas of conservation, and nature reserves.

This document is primarily concerned with the interrelationship of scheduling with World Heritage Site inscription, and does not look in detail at other designations. Scheduling can provide statutory protection to fulfil the objective set out in paragraph 98 of the Operational Guidelines (as quoted above).

5.1 Outstanding Universal Value in relation to cultural heritage

Whilst scheduling and World Heritage Site inscription are two separate processes each of which make use of different assessment criteria to justify their inclusion, there are inevitably similarities between the two sets of criteria. There are several relevant sections within the *Operational Guidelines for the Implementation of the World Heritage Convention* (WHC 13/01, 2013) that explain the concept of Outstanding Universal Value.

Paragraph 49 defines the concept of Outstanding Universal Value:

> Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole. The Committee defines the criteria for the inscription of properties on the World Heritage List.

Paragraph 77 lists the criteria used to assign Outstanding Universal Value:

> The Committee considers a property as having Outstanding Universal Value if the property meets one or more of the following criteria. Nominated properties shall therefore:
>
> (i) represent a masterpiece of human creative genius;

(ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town planning or landscape design;
(iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
(iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
(v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
(vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);

The *Operational Guidelines* also stresses the importance of authenticity and integrity:

82: Depending on the type of cultural heritage, and its cultural context, properties may be understood to meet the conditions of authenticity if their cultural values (as recognized in the nomination criteria proposed) are truthfully and credibly expressed through a variety of attributes including.

1. form and design
2. materials and substance
3. use and function
4. traditions, techniques and management systems
5. location and setting
6. language and other forms of intangible heritage
7. spirit and feeling
8. other internal/external factors

Annex 5 states that the above types of attributes might be considered as conveying or expressing Outstanding Universal Value:

Paragraphs 87 to 88 of the Operation Manual define and examine integrity:

87: All properties nominated for inscription on the World Heritage List shall satisfy the conditions of integrity.
88: Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity therefore requires assessing the extent to which the property:
a) includes all elements necessary to express its Outstanding Universal Value;
b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
c) suffers from adverse effects of development and/or neglect.

Attributes (para. 82) are the elements of a World Heritage Site which embody Outstanding Universal Value and which must therefore be managed appropriately to safeguard that value.

Para 89: For properties nominated under criteria (i) to (vi), the physical fabric of the property and/or its significant features should be in good condition, and the impact of deterioration processes controlled. A significant proportion of the elements necessary to express the totality of the value conveyed by the property should be included.
Relationships and dynamic functions present in cultural landscapes, historic towns or other living properties essential to their distinctive character should also be maintained. Properties nominated as cultural landscapes, should contain key interrelated, interdependent and visually integral elements.

5.2 The Outstanding Universal Value of the North Wales Slate Industry

The following is the draft statement of Outstanding Universal Value submitted by Gwynedd Council to the Department of Culture, Media and Sport (DCMS) in 2010.

To visit, or grow up within, the slate quarrying areas of North Wales is to encounter a remarkable and very striking landscape.

It illustrates the way in which a traditional minority culture adapted to modernity in the classic 'Industrial' period, thereby growing into the confident living culture of today. It did so by evolving technical solutions to geological and processing problems as well as by developing a unique set of craft skills, involving a profound understanding of the nature of the rock to be quarried and processed. These methods in some cases owed something to other industries but were mostly sui generis. These skills were passed on to other quarrying areas, most notably in France and the USA, by exchange of ideas and (in the case of the USA) by emigration.

Its products are found all over the world. The distinctive solution evolved by the industry to the problem of transporting slate from the quarry to navigable water is the locomotive-worked narrow gauge railway. This was identified by engineers world-wide as a model adaptable to their own countries from 1870 onwards. The social gulf between patrician proprietors and workers is seen in the Neo-Norman masterpiece Penrhyn Castle, home of the owner of the major quarry, in relict/preserved workers' vernacular housing, churches and chapels in quarry landscapes.

The Department for Culture Media & Sport considered that the north Wales slate industry meets UNESCO criteria (ii) and (v), as defined in *Operational Guidelines* para.77:

(ii) The north Wales slate industry landscape exhibits an important global interchange of human values in terms of extractive technology, building materials and transport technology and emigration. The influence of its extractive technology is felt in the quarries of the USA and France, and of its transport technology in narrow-gauge rail systems all over the world. The extensive use of the main product is evident world-wide.
(v) The north Wales slate industry landscape is an outstanding example of the adaptation of a traditional human settlement and land-use to modern industry without losing its distinctive character and language. This is representative of a strong minority culture, as well as of human interaction with the environment through quarrying and engineering. (Gwyn 2015, DCMS review of Slate Industry World Heritage Bid: Considerations for Gwynedd Council)

6. THE APPLICATION OF SCHEDULING CRITERIA TO SLATE QUARRIES

As discussed above previous programmes of work have identified the value of defining the application of scheduling criteria in relation to a specific site type or theme. The following section examines the application of the criteria to the scheduling of slate quarries. Consideration of a feature for scheduling will be based on an overall assessment of all the relevant criteria in relation the individual circumstances of each case.

Period
This criterion is of importance where a quarry contains features that are particularly early or characterise a particular period in the development of the slate industry or development of a particular technology or working practice. Most quarries are multi-period and those that preserve evidence of earlier workings and are not dominated by the latest period and the adoption of modern technology will have added interest.

Rarity
Rarity is identified from the number of surviving examples of a particular feature, or groups of features demonstrating a particular process. For example this might include features which demonstrate the use of a particular mechanised technology, though it is also important to recognise the low tech nature of the industry, and the skills of the quarrymen. Sites representative of the latter might leave very slight physical remains, but still be of particular significance because of their rarity. The chronological development of technologies is also a factor to be taken into account, including comparison with other industries and within the slate industry.

Documentation
The significance of a site may be enhanced by contemporary documentation such as historic plans, written descriptions, and records of the working of the quarry. Recent archaeological records such as surveys or excavations are also significant. These can add to our ability to understand and interpret the archaeological remains of quarries, and identify changing strategies and processes.

Group Value
This criterion is of particular importance when assessing slate quarries for scheduling purposes. Individual elements may be important but they have considerable added value when considered in the context of the overall processes being undertaken. Each part of the process leaves its own archaeological traces, and the integrity of the archaeology is largely dependent on being able to demonstrate this interrelationship. A slate quarry would therefore score highly if the relationship between its various elements have been retained and are understandable, or if the chronological development of a technological process is evident. The scope of the potential archaeology of the Slate industry is described in Gwyn 2015.

Features beyond the quarry boundaries such as transport routes, associated settlements and industries, and the landed estates of quarry owners also add greatly to group value.

Survival /Condition
Survival indicates how much survives of what is originally thought to have existed. This can apply at feature level or quarry/landscape level. However the very nature of quarrying meant rapid landscape change and regular construction and destruction of buildings. The survival of features that demonstrate the development of significant phases of a quarry and/or the relationship of the different processes are of particular importance. Evidence for technological innovation and change may also be of major significance.

Condition describes the physical state of the surviving features within a quarry. Assessment of condition needs take into account the rate of natural deterioration of structures. A proactive scheme of stabilisation and protection can aid the case for scheduling and systematic damage for reuse of materials or space would have a negative impact. In practice, once an area has ceased to be operational, natural decay is most common.

Fragility/Vulnerability
Fragility reflects the physical stability of a feature, whereas vulnerability is a reflection of the likelihood of unsympathetic change usually through human, as opposed to natural, intervention.

The relevance of both these criterion for scheduling will depend upon the potential management gains. A very fragile feature which requires remedial attention may benefit from being scheduled because it allows consolidation to be monitored. Sites which are vulnerable from future quarrying might be better protected by management agreements rather than scheduling, or by very selective scheduling of specific features.

Diversity
This criterion would apply if a quarry contained a particularly diverse range of features, either of site type or of chronological range.

Potential
Potential relates to the potential for the recovery of new information, either from physical remains or historic evidence. This could entail the use of archaeological investigative techniques or specialist archival research. It might also include potential for contributing to wider research, including enhancing our knowledge of the industry as a whole, from extraction to end use.

7. DISCUSSION

Application of the above will, with the benefit of professional judgement, allow identification of features and groups of features which meet the criteria for scheduling. Group Value will be particularly significant in identifying larger areas of related features which demonstrate either technological progress or the process-flow through the quarry, including the management of slate waste.

Underground workings are rarely included within the assessment process, despite their potential significance. The scheduling of underground features poses many difficulties which have yet to be resolved, and requires fuller discussion and treatment than can be allowed for here.

Whilst the tendency to limit scheduling to individual features is being re-examined in favour of larger areas, this can lead to difficulties of management, and in certain circumstances it might be better to examine alternative options, including management agreements, or the encouragement of sympathetic re-use. Similarly the sympathetic management of active quarries or those with existing mineral permissions will require a flexible approach, of which scheduling may only play a small role.

The protection given to a site by scheduling provides the necessary measures which the World Heritage Convention requires to assure the survival of inscribed sites. The latter are defined, in part, by physical remains considered to convey or express Outstanding Universal Value. They include:

1. form and design
2. materials and substance
3. use and function

4. traditions, techniques and management systems
5. location and setting.

Similarly Group Value is a reflection of the wholeness and intactness of the natural and/or cultural heritage and its attributes, as identified within the Operation Guidelines (paragraph 89), and specifically those 'relationships and dynamic functions present in cultural landscapes, historic towns or other living properties essential to their distinctive character'. This is further emphasised by the statement that 'properties nominated as cultural landscapes should contain key interrelated, interdependent and visually integral elements' (Operational Guidelines para. 89).

8. SCHEDULING RECOMMENDATIONS: A PILOT AREA - FFESTINIOG QUARRIES EAST: MAENOFFEREN AND DIFFWYS (CASSON)

The following is a pilot scheduling proposal and should initially be seen as a draft for discussion. A large area is proposed for scheduling following application of the criteria discussed in the previous section. A holistic approach is adopted, considering the quarrying landscape in its entirety as opposed to a series of isolated features.

An area of 115.8 hectares in the eastern part of the quarry complex to the north-east of Blaenau Ffestiniog is proposed for scheduling. This comprises areas of Maenofferen, Diffwys Casson, Fotty and Bowydd quarries along with leats, dams, and part of the Rhiwbach tramway in open moorland to the north and north-east of the quarries. The proposed scope of the scheduling is in two approximately equal adjoining areas cut by a band of modern workings (Fig. 1). Fig 2 shows the area recommended for scheduling in relation to the 4th edition 6" ordnance survey mapping (revised 1914). This provides an overview of the extent of the quarries prior to disturbance by modern workings.

Period

The area contains workings from a wide date range. Diffwys is the earliest and is celebrated as the *mam-chwarel* (mother quarry) of Ffestiniog, and was the first to work for export c. 1760. The remains are complex being an amalgamation of four different extraction sites (see Gwyn 2015 Diffwys (Casson) Slate Quarry Prn: 20305). The earliest workings were at Hen Waith (SH71124627c) and continued in use from the 1760s until the 20th century and early features have not survived. The upper eastern part of the works dating from the early 19th century are better preserved and contain numerous *gwaliau* surrounded by distinctive fine waste indicating hand processing. A rail connection and an incline link this area to the floor 6 mill.

The steam powered floor 6 mill, the earliest parts of which date from the late 1850s, is a very early example of an integrated mill. This represented a technological innovation, allowing all processes in the production of roofing slates to take place under one roof.

The quarry survives as a series of 8 working levels with a further four mills surviving on the western slopes along with a well-developed transport system that was connected to the Rhiwbach railway in 1862 and then to the Festiniog railway in 1864. The level of activity in the quarry was low from the 1880s to its closure in 1925. This has resulted in the very good preservation of 19th century features. There has been relatively minor disturbance to some northern areas by modern workings.

Maenofferen remained in use until the 1990s and the remains are therefore somewhat more fragmented. The early water system consisting of reservoirs, aqueducts, and leats which powered the mills at Maenofferen, Fotty and Bowydd is well preserved as are transport links in the form of

railways and inclines. The mill and an extant hydroelectric generator house retain evidence for the progression from water to steam and electric power.

Only a small area of Fotty and Bowydd is recommended for inclusion in the scheduled area much of the quarry and associated infrastructure has been destroyed by recent workings.

The survival of coherent early features at Dyffwys and multiperiod remains demonstrating the development of technology at Maenofferen indicate a high value for the period criterion.

Rarity
The quarry complex as a whole is a rare example of an industrial system that has resulted in major landscape, social and economic change.

Individual features with a high rarity value include the early steam-powered integrated mill at Dyffwys (PRN 60258; Plate 1)and a counterbalance incline with a remote drumhouse at Maenofferen (PRN 60435 and 60437).

The range and coherence of the various elements of the quarries, ranging from complex and sometimes innovative technology to simple or commonplace features such as gwaliau (plate 2) and slate tips is of primary significance. The complete quarry has a high rarity value as an integrated landscape.

Documentation
The development of the quarries is well documented and can be traced via plans and ordnance survey mapping. There are extant archives and extensive secondary studies by the Plas Tan y Bwlch industrial archaeology group along with reports by Gwynedd Archaeological Trust (GAT report 154, 1995) and a detailed report examining areas of Diffwys in relation to current proposals for extraction (Govannon forthcoming). The archaeology and history of the Welsh Sate industry is examined in detail in Gwyn 2015.

The surveys have not been integrated into the regional Historic Environment Record and therefore formal advice offered in the event of mineral or planning applications is likely to be made without knowledge of these records.

Group Value

The inter-relationship and coherence of the features within the proposed area allows full interpretation of the processes being undertaken. This is particularly true of Diffwys quarry, where there have been few changes since the closure of the quarry, allowing the movement of slate to be traced from its extraction points via railways and inclines to mills or tips. The export route of finished products can also be traced. The integrity of the water power system and transport links are of particular importance at Maenofferen. The group value of the features, many of them of minor value when considered in isolation, is therefore very high.

This also applies to the wider landscape beyond the quarry boundary. Group value with the town of Blaenau Ffestiniog, transport links by narrow gauge and standard gauge railway, road, river and sea are all high.

Survival /Condition
The survival of features across the area proposed for scheduling is high. This does not apply across the whole Ffestiniog quarry landscape; areas immediately to the north-western side of the proposed

scheduled area comprising much of the Fotty and Bowydd quarries have been removed by modern workings. In contrast the survival of features in Dyffwys quarry is very high. A comparison of modern aerial photographic coverage and the 1899 and 1919 25" Ordnance Survey maps (Fig. and xx) show a high level of survival within the quarry. Recent haul roads and quarrying, post-dating the aerial photograph have disturbed a small area.

The adjoining Maenofferen quarry has a slightly lower level of survival. The roof of the upper underground workings was removed to allow removal of otherwise unobtainable slate in supporting pillars and conversion of the area into an opencast site (untopping). This only affected a discrete area but destroyed both above- and under-ground workings.

The 19th century mill and associated buildings and counterbalance incline survive adjacent to the recent works as do the majority of the transport links and the leats, remains of aqueducts and reservoirs that provided the water to power earlier phases of the quarry.

The condition of these remains is to some extent a function of when they were last used. Almost all of the features in Dyffwys have decayed to a point of moderate stability and deterioration is slow but ongoing. The mill and other buildings at Maenofferen (plate 4 are, in contrast, well preserved being partially roofed and with some intact machinery. This area was, however, in use until the 1990s and is in a state of rapid decay and some smaller buildings have been demolished and machinery has been plundered for scrap.

Fragility/Vulnerability
Threat levels are very high within a working quarry. Buildings and machinery are both fragile and vulnerable in the context of modern quarrying practices. This has been clearly demonstrated at both Dyffwys and Maenofferen. The untopping of underground workings was very destructive and demonstrates an obvious threat.

The unregulated construction of haul roads poses a less obvious threat but has caused limited though significant damage to Maenofferen. Three buildings adjacent to the road passing in front of the mill have been demolished, apparently with little justification. In addition roads cutting into the northern and eastern parts of Dyffwys have damaged some features and have undermined others thus increasing their fragility (Plate 3). Other threats include removal of machinery for scrap and reuse of tips for crushed slate.

The presence of existing mineral planning permissions conveys a very high level of risk and vulnerability to much of the proposed area. Some areas, depending on the geology, are more likely to be targeted for extraction than others.

Overall levels of fragility and vulnerability must be seen as very high.

Potential
The Ffestiniog quarries have been studied in some detail by RCAHMW, the Plas Tan y Bwlch group and GAT. There is scope for research into the quarry's technical and economic role within the global slate and building industry but the potential for yielding significant levels of additional historic information is probably low to medium.

Discussion

The proposed scheduled area encompasses a significant part of a slate quarrying complex that charts major landscape, social and economic change. For these reasons alone it would score highly on the rarity criteria. The proposed area demonstrates a high level of survival of inter-related industrial features. Some individual features should be seen as having a high rarity value but most are relatively common. Their significance is derived from their group value. The processes of production, including extraction, transport, processing to finished product, waste removal and power generation can be easily understood throughout the proposed area (Fig 3). There is also good evidence for the development of the quarry; superimposed changes in power generation and transport systems are preserved and understandable.

Group value with settlement and transport systems in the surrounding landscape is also of great importance. Slate extraction has shaped the area around Blaenau Ffestiniog to a point where the pre-industrial landscape has been largely obliterated and the quarries and associated settlement dominate the area. The development of transport systems in the form of narrow and standard gauge railways are also a direct result of slate extraction.

Threat levels and fragility are demonstrably very high. Ongoing extraction has caused limited but significant damage and has the potential to reduce the value of the quarries in relation to several scheduling criteria.

In order to preserve the integrity of the quarry and the physical remains of the quarrying processes an area of 155 ha has been recommended for scheduling. This will clearly be a challenge within a working quarry, and will need to be carried out in consultation with the quarry owners, taking into account their proposals for future extraction, and their mineral extraction permissions. Combining scheduling with both listing and management agreements might be the most appropriate response.

The incorporation of the existing surveys into the Historic Environment Record should be seen as an essential aid to the future management of the site.

David Hopewell
Gwynedd Archaeological Trust
G2398 Draft 002

APPENDIX I: ILLUSTRATIONS AND PLATES

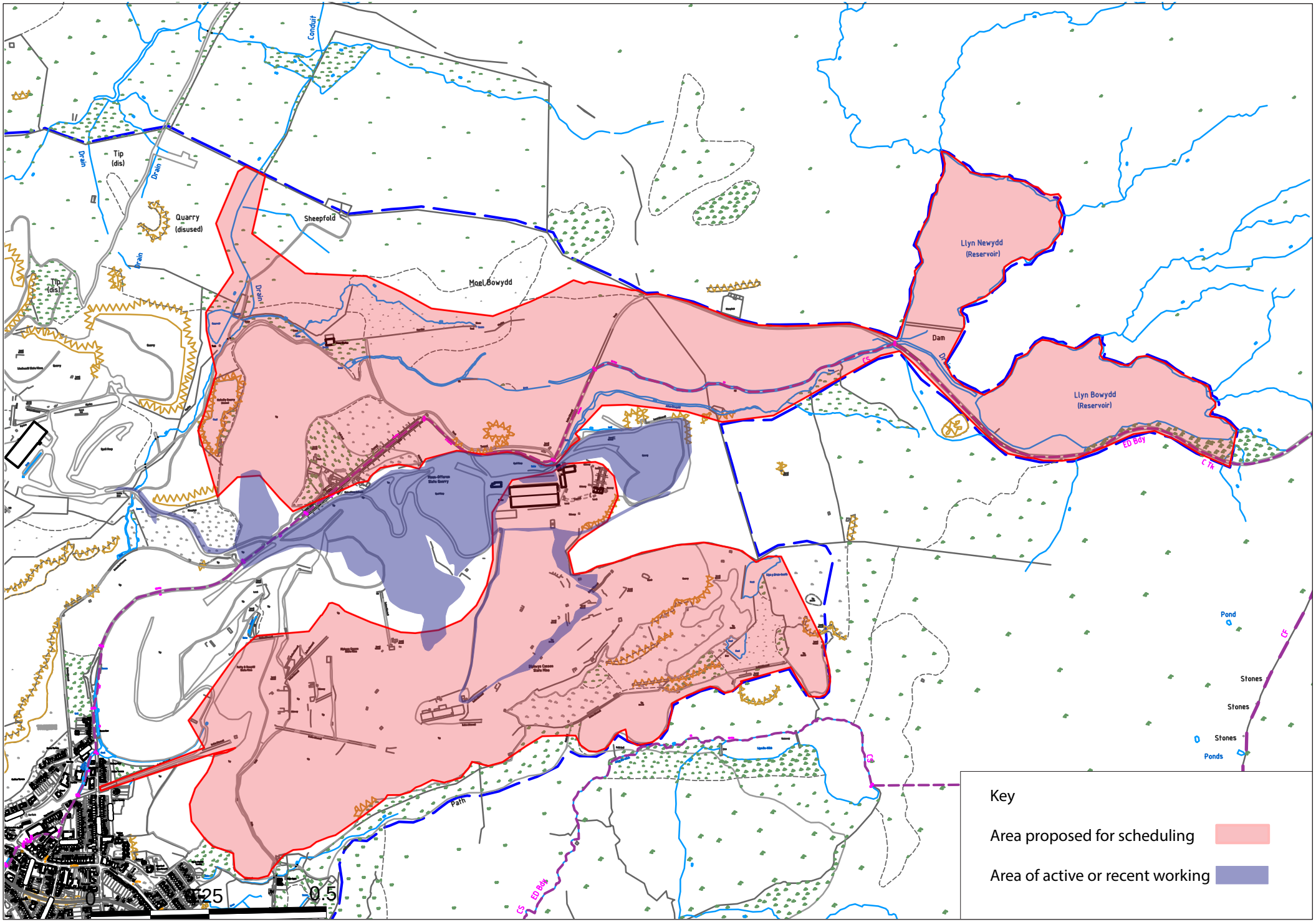


Figure 1: Diffwys and Maenofferen Quarries - proposed scheduling area

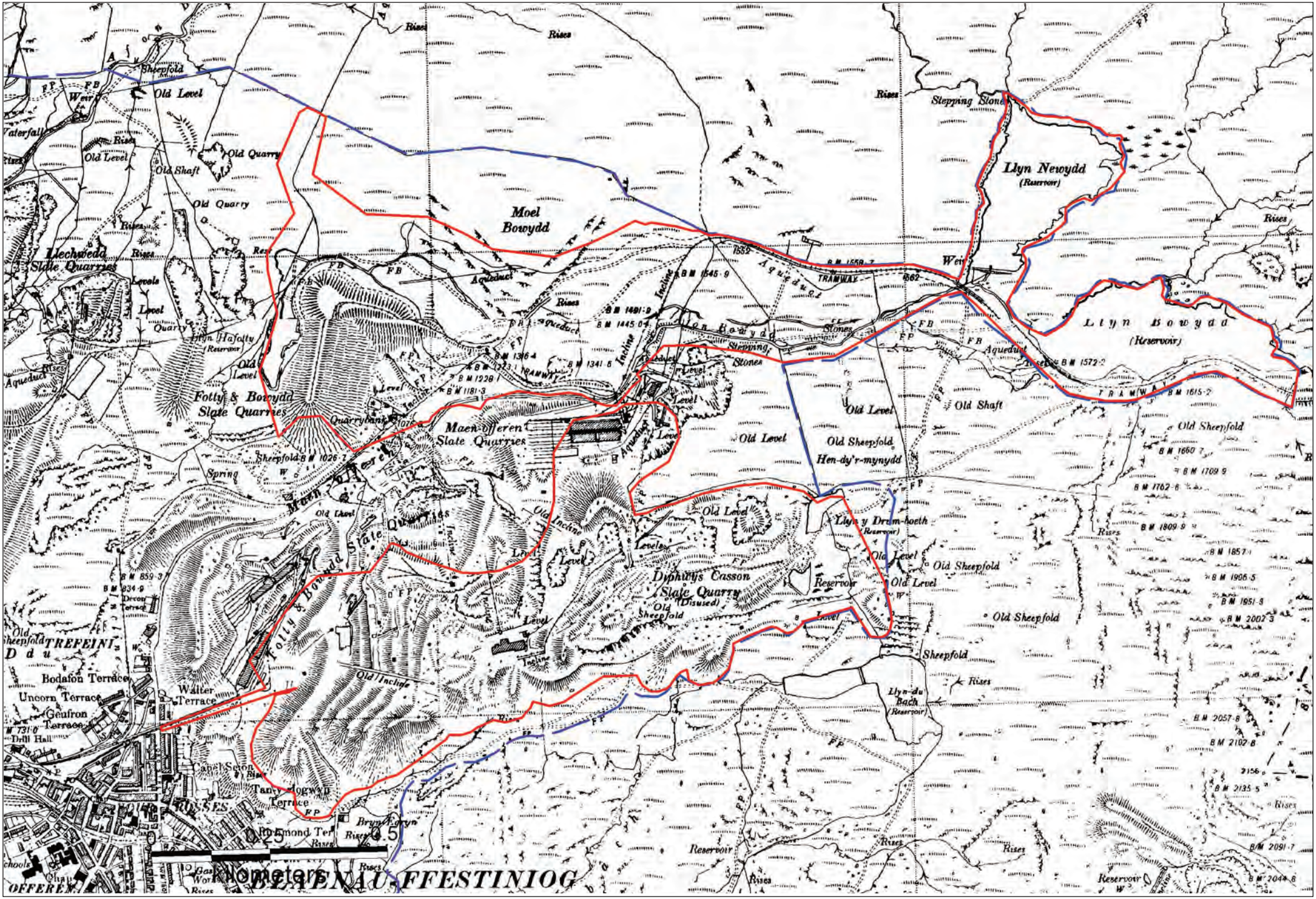


Figure 2: Proposed scheduled area (OS 6" 1924)

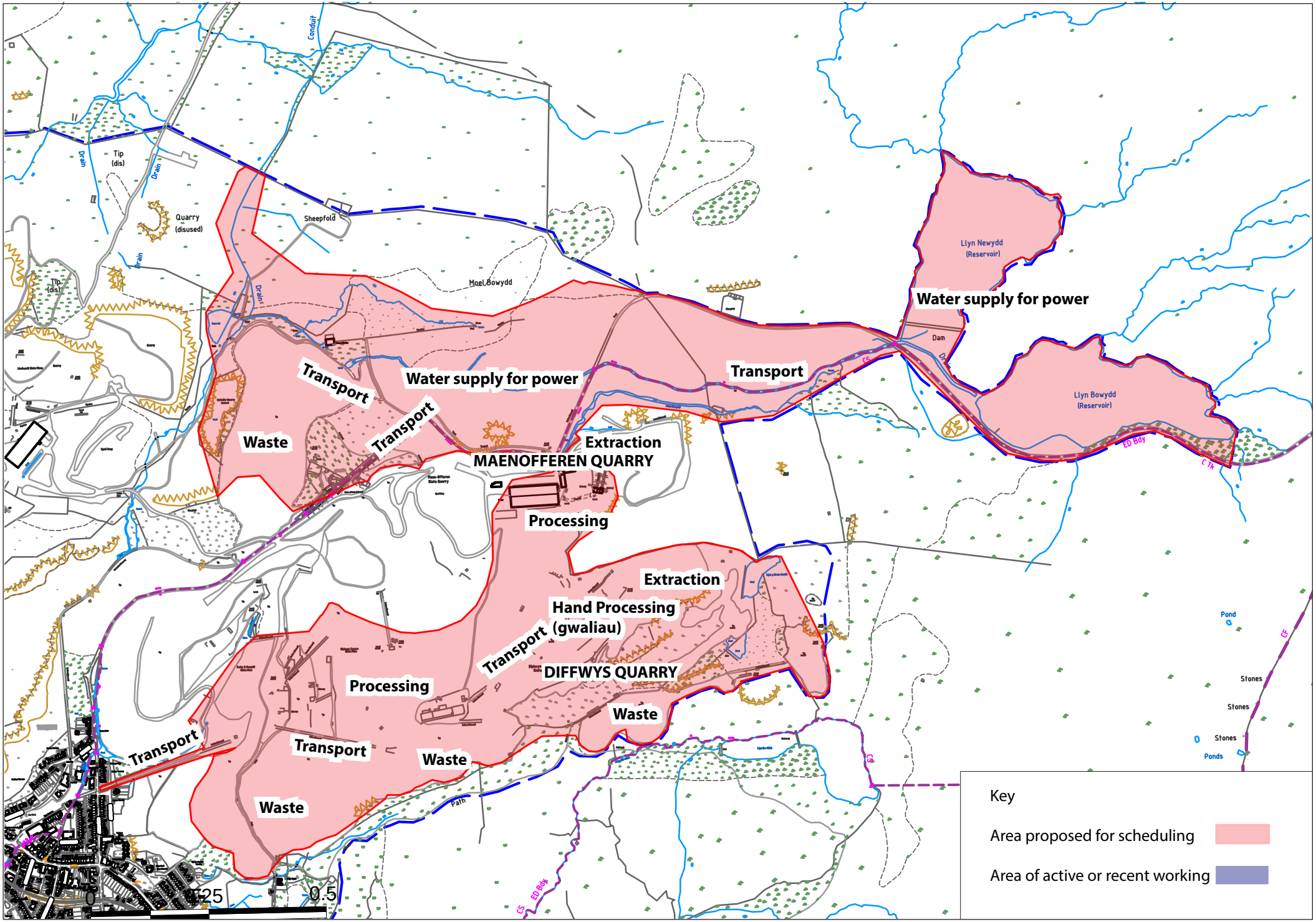
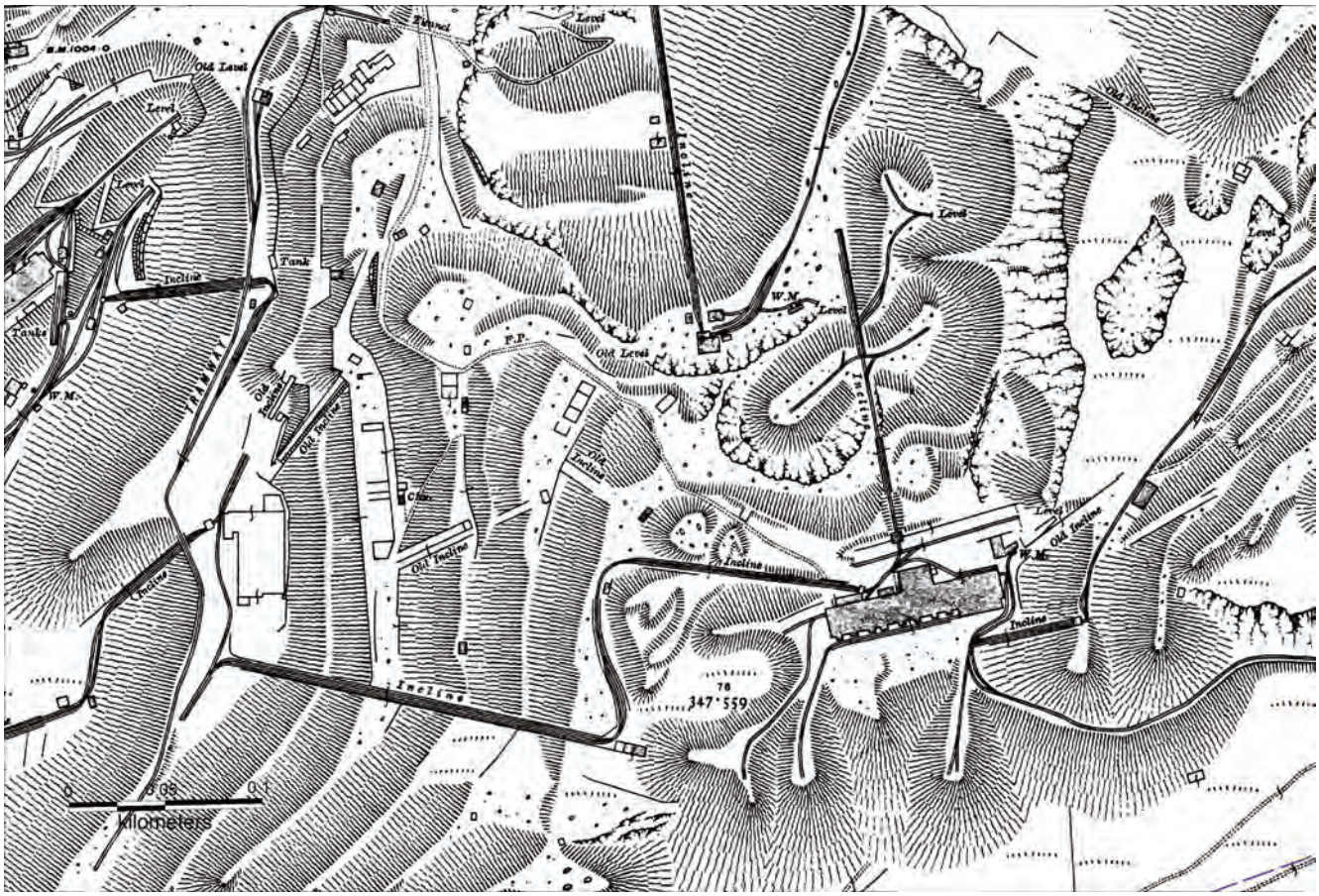


Figure 3: Diffwys and Maenofferen Quarries



Western Diffwys quarry OS 25" 1913

Western Diffwys quarry aerial photograph (Bluesky 2006)

Plate 1: Mill, Diffwys Quarry

Plate 2: Gwaliau, Diffwys Quarry

Plate 3: Threat from quarry road, Diffwys Quarry

Plate 4: Mill, Maenofferen

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