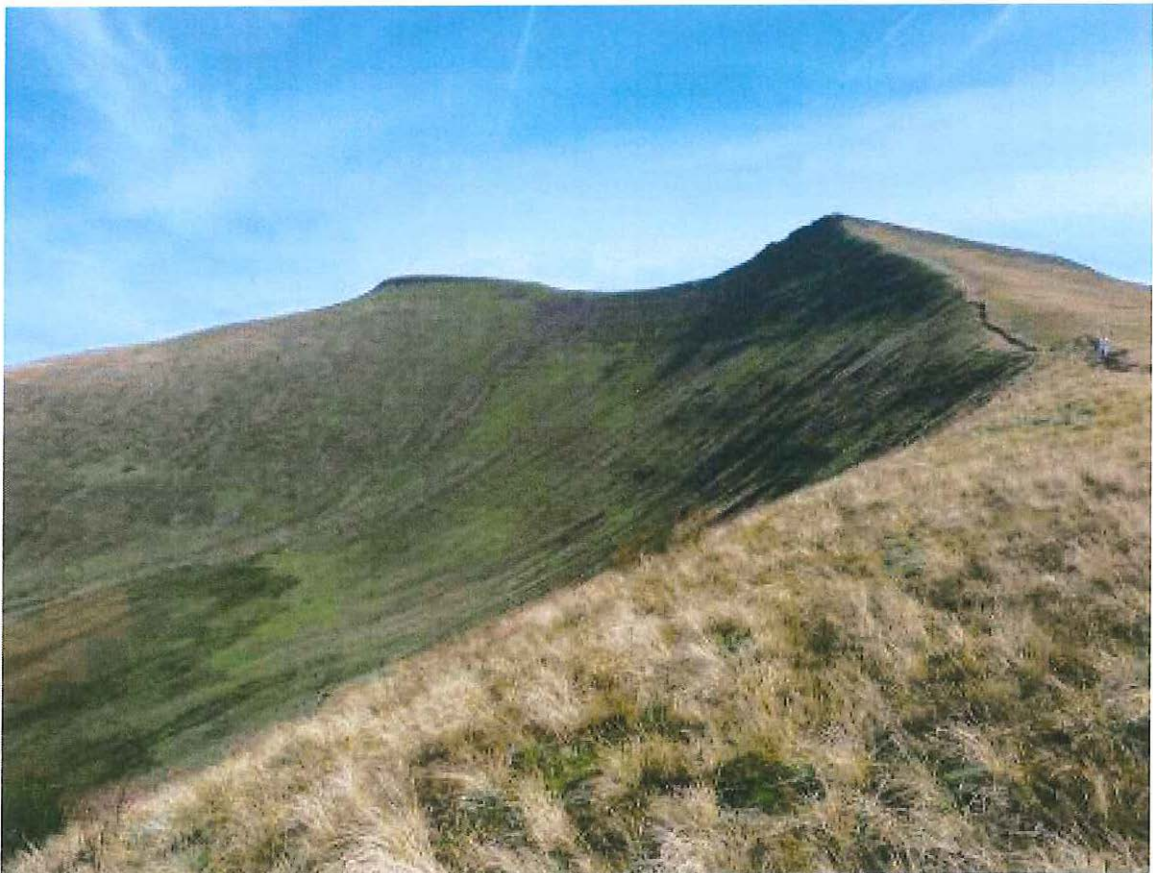


South Wales RIGS Audit

Torfaen County Borough Council

Geology and Landscape Wales

Commercial Report CR/12/033



1 Introduction

This report is the published product of a study by the British Geological Survey (BGS), on behalf of the Welsh Government. The project was funded by the Aggregate Levy Sustainability Fund for Wales. The aim of the study was to establish a suite of sites to become RIGS, to describe the geology and landscape of the South East Wales region. The project ran from April 2008 until March 2012.

1.1 GEOCONSERVATION

The importance of conserving sites which reflect the geodiversity of the UK landscape and natural environment is now recognized as being of major importance in the context of sustainable land-use planning and development. Such sites can provide access to key bedrock, superficial deposits and soil units which contain instructive evidence of previous periods of environmental change, including climate and land-use change; many chart the history of local mineral extraction and associated industrial development; others were, and remain, the only source for building stones that contribute to our architectural heritage.

Increasing environmental awareness within the population and an appreciation of where the raw materials which drive our economy are derived from, is leading to increased consideration of local geology, the need for high quality, consistent record keeping and the necessity of protecting vulnerable sites. This interest is also reflected in increasing numbers attending field trips organized by local geological organisations and is further exemplified by the achieving of European and Global Geopark status for Fforest Fawr which lies within the project area (*UK RIGS 2000*)

The Welsh Government “Technical Advice Note 5” *Nature Conservation and Planning* (discussed later in this document) lists the many the conservation designations that should be considered during the planning process of which RIGS is just one component. Many of these can include geological interest. These are divided into International, National and Local designations. Listed below are many that may include geological interest:

Internationally Important Sites: Special Protected Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. These are in the main related to bird or other flora and fauna species.

Nationally Important Sites: National Nature Reserves (NNR’s), Sites of Special Scientific Interest (SSSI)* and Marine Nature Reserves (MNR’s).

Regionally or Locally Important Sites: Local Nature Reserves (LNR), Sites of Importance for Nature Conservation (SINC), Regionally Important Geological Sites (RIGS), Limestone Pavements, Coastal waters, lakes, rivers, streams or other wetlands (*Welsh Assembly Government, 2009*).

National Parks: National Parks are “protected areas” because of the beauty of their countryside, their wildlife and cultural heritage. They are designated under the Countryside Act 1949 (*anon 2012*)

Areas of Outstanding Natural Beauty (AONB): These are areas which are “precious landscapes whose distinctive character and natural beauty are so outstanding that it is in the nations interest to safeguard them”. They are created under the Countryside Act of 1949. The Gower is an AONB within the South Wales RIGS area. (*anon 2010*)

***Geological Conservation Review (GCR)** Is a project intended to provide a record of all of the sites of geological interest in the UK. Many of these sites are of international importance and are either already notified as SSSI's or are being considered for notification. (*Ellis NV et al 1996*)

1.2 WHAT ARE RIGS?

Regionally Important Geodiversity Sites – RIGS - are currently the most important places for Earth Science conservation outside statutorily protected land such as Sites of Special Scientific Interest (SSSI). RIGS form a network within a county or region of geological sites that are considered worthy of protection for their Earth Science importance. They are identified by locally developed criteria which may emphasise the local educational, historical and recreational resource rather than its national scientific significance which is the remit of SSSI status. RIGS form a network of second tier sites that supports the SSSI sites but which do not have statutory protection. However, the designation of RIGS is one way of recognising and therefore protecting important Earth science and landscape features through the local authority planning system for the future (*UK RIGS, 2000*).

The RIGS initiative was established as there was an identifiable need to:

- Conserve local geological and geomorphological sites for educational purposes.
 - Involve people in Earth heritage conservation.
 - Build on existing resources and good practice.
 - Build a network of locally important sites to underpin the SSSI network and protect locally important sites.
 - Facilitate consultation between existing local groups already involved in local Earth heritage conservation.
- (*UK RIGS, 2000*)

RIGS are selected for their scientific, educational, historical and aesthetic values:

- **Scientific** sites are important for ongoing research in the Earth sciences.
- **Educational** sites provide an outdoor geological classroom for all ages and abilities.
- **Historical** sites demonstrate the importance of geology in archaeological and historical constructions, the development of geology as a science and commemorate the outstanding contributions of important geologists.
- **Aesthetic** sites demonstrate the importance of geology to understanding and appreciating some of our cherished landscapes and scenery

Sites may be designated under one or more of the above categories.

(*AWRG Leaflet*)

1.2.1 RIGS and SINC's

It is recognized that not all sites identified will achieve RIGS status, although the site may be of local significance. For the purposes of this report, SSSI sites are considered the primary conservation status with RIGS being secondary. As a consequence, this study has identified a third tier of sites which should be considered by local authorities for inclusion within the Sites Important for Nature Conservation (SINC) network.

These tertiary sites may be more accessible or provide additional supporting scientific or educational resources to those recommended for RIGS. For example, the RIGS selection process may highlight a site quoted in literature or which may be the "type locality" of a particular geological unit. This means that that particular site is the place where this particular feature was

first described in scientific literature and where the typical nature of a formation or fossil or mineral can be studied. Often these sites were identified decades ago, the sites have subsequently degraded or are less accessible, and whilst the site remains scientifically significant, other locations today may highlight the same features, be more accessible or are more easily utilised by the local community. It is these sites which are recommended for SINC status and may in time be raised to RIGS status if the original locality is lost.

A good example within Cardiff Council is the type locality for the Llanishen Conglomerate. Today this important locality is restricted to a very small outcrop in Llanishen Railway Station yard and the remainder of the outcrop is largely hidden by retaining walls. This study recommends this site as a RIGS for its historical importance as the place that this formation was first described. However, at Transh-y-Hebog, North of Cefn Onn there is a larger outcrop of the same formation which is much more easily accessible and so it has been recommended as a SINC. Together, both sites provide important information of this particular geological feature.

Although the designation of a RIGS is primarily about conservation of an identified feature, a site with a seemingly destructive process such as a quarry could also be identified as a RIGS. The features for which a site has been chosen may be improved by further excavation in active quarries. There may be scope within the restoration phase of quarrying operations to preserve a face which then may have subsequent scientific or community amenity value. Consultation with the operator or owner prior to closure may result in quarry faces being graded to make them safe or accessible once extraction has come to an end.

1.3 RIGS GROUPS IN WALES

The South Wales RIGS Audit, was the fifth RIGS audit undertaken in Wales, carried out under the standards established by the Association of Welsh RIGS Groups (AWRG) to ensure consistency of approach and data recording, so that results contribute to a pan-Wales dataset. The project follows on from evaluations undertaken in NE Wales by NEW RIGS, Gwynedd and Anglesey by Gwynedd and Mon RIGS, Central Wales by The Central Wales RIGS Group and South West Wales by the South West Wales RIGS Group. This project completes the initial audit of sites for the Principality. Wales becomes the first of the UK nations to complete its audit of geological sites.

Figure 1 RIGS Groups in Wales including boundaries and RIGS defined to date illustrates the distribution of RIGS and SINC's, designated by these groups, in Wales, to date.

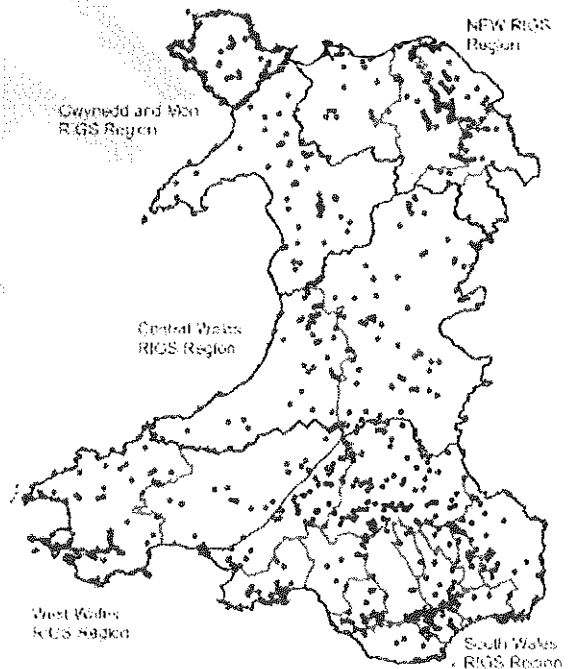


Figure 1 RIGS Groups in Wales including boundaries and RIGS defined to date

1.4 PROTECTION OF GEOLOGICAL SITES AND WELSH PLANNING SYSTEM

RIGS do not enjoy statutory protection under law as is the case for Sites of Special Scientific Interest (SSSI). The protection of RIGS is achieved most effectively through the planning system through local experts recommending sites to the appropriate planning authority. Most local planning authorities regard RIGS as equivalent to non-statutory wildlife sites and thus list them in their local plans. One of the key aims of the initiative is to conserve a series of locally important geological sites as many geological localities are threatened by irreversible damage.

Some geological sites, within the South Wales Region are of international importance and are protected as SSSI's. These have often been identified by the Geological Conservation Review (GCR). Where possible, these sites are referred to in the geological discussion section of this report as they form a significant part of our geological heritage and part of the network of sites of geological interest of which RIGS forms a part.

Planning is a devolved Welsh Government responsibility and so The Welsh Government has published, in 2011, a "Planning Policy Wales Edition 4 (PPW)" document which sets out the land use planning policies of the Welsh Government. This document is further supplemented by "Technical Advice Notes (TANs)". The PPW, TANs and circulars together comprise the national planning policy which should be taken into account by local planning authorities in Wales in the preparation of unitary development plans (UDP). They may also be used to make decisions on individual planning applications.

Chapter 5 of the PPW deals with "Conserving and Improving Natural Heritage and the Coast" and is most relevant to RIGS. The document sets out its policy objectives as being to:

- promote the conservation of landscape and biodiversity, in particular the conservation of native wildlife and habitats;
- ensuring that action in Wales contributes to meeting international responsibilities and obligations for the natural environment;
- ensure that statutory designated sites are properly protected and managed;
- safeguard protected species and to
- Promote the functions and benefits of soils, and in particular their function as a carbon store.

Natural heritage in Wales is defined as including its geology, landforms, biodiversity and its natural beauty and amenity (*Welsh Assembly Government, 2011*).

In 2009, the Welsh Assembly Government issued Technical Advice Note 5 (TAN 5) to provide advice on how local authorities address nature conservation issues in planning documentation, and so supplement the information in Planning Policy Wales (2002). TAN 5 makes specific reference to how "*...the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation.*" (Paragraph 1.2.1.). Paragraph 3.2.4. goes on to highlight that under Section 11 of the Countryside Act (1968) all public bodies are "*...to have regard to the desirability of conserving the natural beauty and amenity of the countryside.*" Whilst Section 49(4) of the Act provides that the "*...conservation of natural beauty are to be construed as including reference to the conservation of its flora, fauna and geological and physiographical features.*"

The following extracts illustrate the importance given to geology and geodiversity within this document:

"'Geodiversity' is the variety of geological environments, phenomena and active processes that make landscapes, rocks, minerals, fossils, soils and other superficial deposits that provide the framework for life on earth. Geodiversity is important because it underpins biodiversity with soils being the link between them."

"The geology of Wales, including its landforms, minerals and fossils, is diverse, visually impressive and of great scientific importance."

RIGS are defined in this document as "local Sites", meaning that they are of local rather than national interest. Local sites are defined as having "important role to play in meeting biodiversity targets and contributing to the quality of life and well-being of the community. Paragraph 5.3.11 of PPW explains the policy in respect of such sites. Policies in Unitary Development Plans (UDP's) and Local Development Plans (LDP's) provide for their protection."

The nature conservation interests for which they have been designated are a material consideration in planning decisions.” Paragraph 5.3.11 as mentioned above, explains that “non-statutory designations should apply to areas of substantive conservation value where there is good reason to believe that normal planning policies cannot provide the necessary protection.”

TAN 5 specifically refers to RIGS as a “Nature Conservation Interest” in Table 4.1. that should be considered when an application for any proposed development is submitted, and that appropriate regard should be made to the relevant body at any early stage in the pre-application discussion.

The designation of RIGS and geological SINC’s allows local authorities to discharge their duties under this legislation and the relevant Welsh Government policies, usually via the mechanism of the Local and Unitary Development Plan (LDP/UDP) process.

TAN 5 also states that “Locally designated sites should be subject to the application of rigorous criteria to ensure their designation is justified on biological or geological grounds. The process of designating and maintaining the sites should be transparent with records and assessments publicly available, unless information about particular species is sensitive in terms of their protection. Developers should be able to identify how their proposals may affect the interests for which the sites are designated (either positively or negatively) and where relevant, how the sites contribute to wider ecological networks or mosaics” (*Welsh Assembly Government, 2009*).

This last paragraph underlines the need for a robust selection methodology, thorough scientific investigation and detailed documentation of sites proposed as RIGS so that the validity of chosen sites is clearly demonstrated.

1.5 RIGS AND PLANNING APPLICATIONS

Each RIGS has a report that describes the importance of the site (Appendix 1), its geological setting and may also provide guidance on how the site could be used. The report will also provide enough information for a geologist to understand the importance of the site and what kinds of development would harm or potentially improve the site.

In contrast to the development of many biological conservation sites, a planning application that involves a RIGS does not necessarily completely preclude the site’s development. Many RIGS will be destroyed by development but many can be improved. For example; a quarry development may expose more of the rocks that are of interest and may improve the interest of the site. In situations such as these, discussion with developers to consider, for example, leaving a face intact at the end of the life span of extraction works, would be helpful.

If there are questions in regard to potentially damaging operations at a RIGS, queries can be made to the British Geological Survey Cardiff, The Countryside Council for Wales or Association of Welsh RIGS Groups who will be able to provide guidance as to specifics of each site and the appropriateness of specific applications.

1.6 SENSITIVE SITES

Some of the RIGS are considered to be sensitive and their details should not be routinely distributed. This may be because a landowner objects to access (RIGS status DOES NOT confer a right of access) or may be because the site is vulnerable to over collecting or vandalism and so attention should not be drawn to these sites. If a site is considered to be of this nature, only a summary of the site will be published. This will include contact details of a relevant geological institution who will be able to help with any queries that may arise regarding the site.



South Wales RIGS Group Site Record RIGS Description

SECTION A

General	South Wales
Site Name: Big Pit: National Coal Museum, Blaenavon	File Number: Site_TS_5
RIGS Number: 584	Surveyed by: T Sharpe
Grid Reference: SO 2390 0870	Date of Visit: Many to date of writing
RIGS Category: Scientific, educational	Date Registered:
Earth Science Category: Stratigraphical, petrological, industrial , historical	Owner: National Museum of Wales Planning Authority: Torfaen County Borough Council
Site Nature: Museum / disused coal mine	Documentation prepared by: Tom Sharpe
Unitary Authority: Torfaen County Borough Council	Documentation last revised: 5 th September 2011
OS 1:50,000 Sheet: 161	Photographic Record:
OS 1:25,000 Explorer Sheet: OL13	
BGS 1:50,000 Sheet: E232	
<p>RIGS Statement of Interest:</p> <p>Big Pit provides the only easy underground access to coal seams and their associated strata within the Middle and Lower Coal Measures along the eastern margin of the South Wales Coalfield. Although the site is used for social history educational tours led by former miners, it has the potential to be of great value in geological education. The rocks seen underground can be matched up with rocks exposed (albeit poorly) at the surface on the western side of Bloreng, and can demonstrate how the westward tilt of these surface rocks and their displacement by several faults determines the depth at which these rocks are found underground at Big Pit. The coal seams accessible underground also allow the possibility of limited sampling for research on the composition of these particular coals and their associated rocks.</p> <p>The site also provides a fine view of the industrial landscape of the Blaenavon World Heritage Site and of the relationship between the local geology and topography.</p>	

Geological setting/context: Big Pit is situated at an altitude of 383 m above sea level on the southwestern side of the Afon Lwyd valley about 1 km west of the town of Blaenafon. The upper part of the site near the Pithead Baths provides a good view across the natural and industrial topography of the Blaenavon World Heritage Site. Behind (southwest of) Big Pit, Coity Mountain rises to a height of 581 m. To the east, the town of Blaenafon occupies the valley floor and rises up the eastern slopes of the valley. On the northwestern side of the town is the site of the Blaenafon Ironworks which date from 1788. The hill beyond Blaenafon is Mynydd-y-garn-fawr (500 m) which extends north and east onto Blorenge (561 m).

Between Mynydd-y-garn-fawr and Coity Mountain lies the full thickness of the South Wales Coal Measures Group in this area, with beds dipping to the southwest at about 5°. The South Wales Coal Measures Group here is only about 200 m thick, compared with about over 800-900 m thickness in the western part of the Coalfield.

Mynydd-y-garn-fawr and Blorenge are capped by 'Farewell Rock' sandstones which lie below the Garw Coal. The base of the South Wales Coal Measures Group, the Subcrenatum Marine Band, lies close to the crest of Mynydd-y-garn-fawr. The lower slopes of the hill, beneath Blaenafon, are underlain by beds of the South Wales Coal Measures Group and these extend across to the western side of the valley and the area around Big Pit. Almost all of the ground underlain by these beds has been disturbed by workings for coal and ironstone and by waste tips.

The upper slopes of Coity Mountain above Big Pit (best viewed from near the water balance), are formed of sandstones of the Brithdir and Hughes members of the Warwickshire Group Pennant Sandstone Formation. Sandstones of the Brithdir Member are exposed in Coity-mawr Quarry on the slope above Big Pit. The Brithdir coal lies below these sandstones and is worked in a drift mine on the slope. The Deri Formation between the South Wales Coal Measures Group and the Pennant Sandstone Formation is obscured by landslips.

Big Pit is located on the NNW-SSE Blaenavon Fault which forms the western side of the Blaenavon Trough whose eastern margin is defined by the Carreg Maen Taro Fault about 1-1.5 km to the east. The Blaenavon Fault has a downthrow of about 76 m at Big Pit, but this decreases to the north and south, as well as upwards along the fault plane. The Carreg Maen Taro Fault has a westerly downthrow of about 10-12 m.

Originally called Kearsley Pit and sunk in 1860, Big Pit was renamed in 1880 when the diameter and depth of the shaft were increased. Its oval shaft 5.5 by 4.6 m wide was the first in the area wide enough to have cages which could hold two adjacent drams of coal. Big Pit's workings incorporate a number of other coal and ironstone mines, some of which date back to 1812. Coity Pits, at the top of the Big Pit site and to the west of the Blaenavon Fault, were sunk in 1840 and worked the Spotted Ball Mine and Bottom Vein Mine ironstones in the South Wales Lower Coal Measures Formation. Coity now serves as the upcast shaft at Big Pit.

In 1973 Big Pit was renamed Blaenafon New Mine. Mining ceased in 1979 and the

mine closed in 1980 by which time it was the oldest working mine in South Wales. It reopened as a museum in 1983, reverting to the name Big Pit. It became part of the National Museum of Wales in 2001.

The coal seams worked at Big Pit were the Garw, the Lower Five Feet/Gellideg (locally called the Old Coal), the Lower Seven Feet (Yard locally), and the Yard/Upper Seven Feet (Meadow Vein) in the South Wales Lower Coal Measures Formation; and the Lower Nine Feet/Bute (locally Black Vein), the Upper Nine Feet (Horn), the Upper Six Feet (Threequarter), the Lower Four Feet (Big Vein) and the Upper Four Feet (Elled) in the South Wales Middle Coal Measures Formation.

Today, the Lower Five Feet/Gellideg, the Lower Seven Feet, the Lower Nine Feet/Bute and the Upper Nine feet are accessible, as are some of their associated mudstones and seatearths. Plant remains such as *Stigmaria*, *Lepidodendron* and *Cordaites* are visible in some of the mudstones.

The workings straddle the Blaenavon Fault which lies a short distance southwest of Pit Bottom. To the east of the fault, the accessible mine workings are in the Middle Coal Measures Formation, to the west, they are in the Lower Coal Measures Formation.

Seams of clay ironstone nodules, which were first worked at Coity Pits, can be seen in places in the underground workings to the west of the Blaenavon Fault.

References:

BARCLAY, W.J., 1989. *Geology of the South Wales Coalfield, Part II, the country around Abergavenny. Memoir for 1: 50 000 geological sheet 232 (England and Wales)*. Third edition. HMSO, x + 147pp.

BARCLAY, W.J. & JONES, D.G., 1978. Recent boreholes in the attenuated Carboniferous strata of the Blaenafon-Pontypool area, Gwent. *Bulletin of the Geological Survey of Great Britain*, No 67, 17pp.

LEE, C., 1983. Big Pit – Blaenafon. A geological guide. *Geology teaching*, **8**, pp.116-122.

ROBERTSON, T., 1931. *Sections of shafts in the Coal Measures of the Abergavenny District (Sheet No 232) of the South Wales Coalfield being supplementary to Vertical Sections Sheet 81*. Geological Survey of England and Wales.

ROBERTSON, T., 1933. *The geology of the South Wales Coalfield: Part II, the country around Abergavenny*. 2nd edition. Memoir of the Geological Survey of England and Wales, xi + 145pp.

STRAHAN, A. & GIBSON, W., 1900. *The geology of the South Wales Coalfield, Part II. The country around Abergavenny, being an account of the region comprised in Sheet 232 of the map*. London: HMSO, iii+ 103pp.

THOMAS, W.G., 1981. *Big Pit Blaenafon*. Cardiff: National Museum of Wales, 49pp.

WATERS, C.N., et al, 2011. *A revised correlation of Carboniferous rocks in the British Isles*. Geological Society Special Report No 26, iv+ 186pp.

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:

X

Comment: Access is by guided tour only.

Safety:

X

Comment: The underground route can be wet and slippery and the roof low in places. Hard hats and lamps are provided and visitors are accompanied by a guide. The site is subject to relevant mines safety legislation.

Conservation status: Big Pit lies within the Blaenavon World Heritage Site.

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: National Museum of Wales

Planning Authority: Torfaen (for the surface).

Planning status/constraints/opportunities: The site is still classed as an operational mine and is thus subject to mining safety legislation.

CONDITION, USE & MANAGEMENT:

Present use: Museum

Site condition: Good

Potential threats: Rockfalls from roof and wall and remedial or preventative work (eg shuttering) may obscure rock and coal faces.

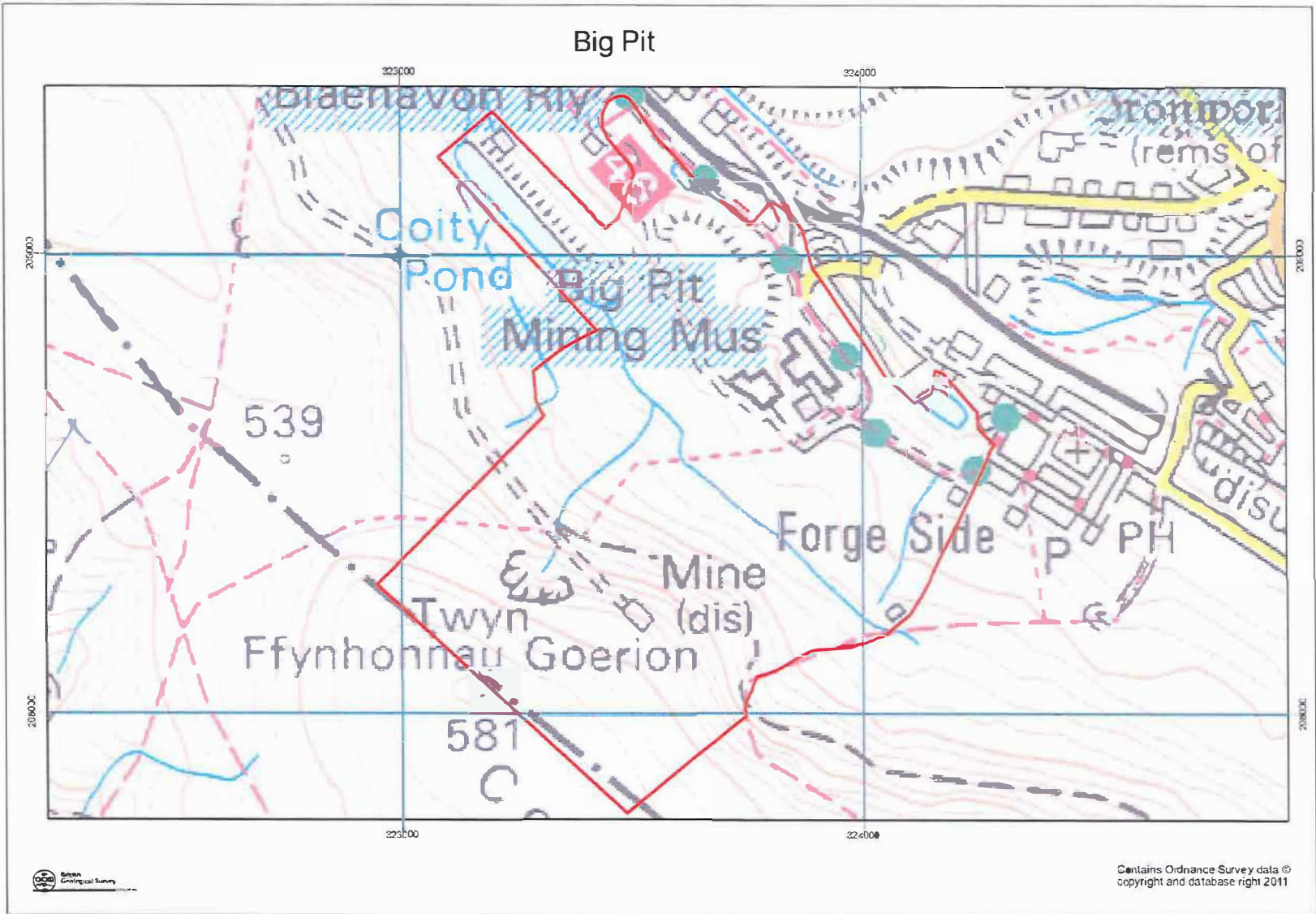
Site Management: Maintain access to the geological sections underground.

SITE DEVELOPMENT:

Potential use (general): The site has potential for studies in sedimentology, stratigraphy and coal petrology.

Potential use (educational): The site is of potential value in secondary and tertiary geological education.

Other comments:





South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Blaen Pig and Canada Tips	File Number: Site AB 39
RIGS Number: 778	Surveyed by: Rhian Kendall
Grid Reference: SO 2370 1160 (center point)	Date of Visit: Various over 15 years. Last visit 16 th July 2011
RIGS Category: Historical, Scientific	Date Registered:
Earth Science Category: Stratigraphic, Sedimentological, engineering geology, industrial/historical	Owner: Private Planning Authority: Torfaen County Borough Council and Monmouthshire County Council
Site Nature: Spoil Tips, cliffs and industrial remains	Documentation prepared by: Rhian Kendall
Unitary Authority: Torfaen County Borough Council and Monmouthshire County Council	Documentation last revised: 28 th July 2011
OS 1:50,000 Sheet: 161	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: OL13	
BGS 1:50,000 Sheet: E232	
<p>RIGS Statement of Interest:</p> <p>The opencast faces and waste tips of Blaen Pig and Canada Tips are proposed as a RIGS for a number of reasons. The site is dominated by the World War II opencast workings of the Canada Tips which are believed to be the only surviving, unrestored, early opencast sites in Britain. There are also other industrial features such as hushes, pits, levels, leats and mines at Blaen Pig as well as tracks and tramroads.</p> <p>The site is also important for the study of the South Wales Middle Coal Measure which are rarely exposed at the surface and for engineering students wishing to study open cast waste tips.</p>	

Geological setting/context:

Surface mining for coal in Pwll Du began in 1941, using specialist excavation equipment from America. Production peaked in 1944 at 8.65 million tons as part of the World War II War effort. The name Canada Tips, given to the waste tips, originates from these times when the Canadian Army, based in the UK, provided the specialist drills and experience needed for this kind of work. It is thought that these are the only workings of this type in Britain to be surviving in an unrestored condition (Barber 2002) and one of the earliest surviving examples of open cast working in Britain (TCBC 1999). This man made landscape, although unnatural and to many unsightly, is a rare example and a reminder of what these kinds of workings would have looked like.

The Canada Tips also give a relatively rare surface opportunity to examine the South Wales Middle Coal Measures. In South Wales, The Lower and Middle Coal Measures are sequences of coarsening upwards, coal capped units. These cycles are typical of "fluvial-dominated delta plains". Fine mudstones at the base of a sequence, coarsen through silty mudstones and siltstones to fine sandstones. The finer lithologies are frequently rich in carbon and ironstones of siderite are common. The fine mudstones are lacustrine in origin, deposited in deep fresh water lakes. The sandstones at the top of the cycles are mouth bar deposits of minor channels. Sandstones can also occur at any point in the cycle as distributary channels, crevasse splays and levee deposits. Channel fill sandstones are the coarsest and can be conglomeratic at their bases, fining upwards and are cut into underlying beds. (Barclay, WJ. 1989)

There are also a number of coal seams intersected at this site, mainly now covered by scree. It is however possible to see the Upper 6 foot, seen as a distinct line of black brash extending northwest and southeast of SO24437 10960 for approx 50m near the top of the scarp. The seam is thought to be seen again in small outcrop at SO24618 10928 where it is also seen as a line of brash along the path. The Lower and Upper 4 feet are recorded at this site.

The Aegiranum Marine Band is known to outcrop on the back wall of the Blaen Pig Open cast where it is seen as a Lingula bed at the base of a upwards coarsening cycle 8m thick. (Barclay, WJ. 1989)

The eastern most fault of the Blaenavon Trough – the Carreg Maen Taro Fault is documented as being visible in the back wall of the opencast at SO 2370 1146 where it has a throw of 12m. (Barclay, WJ. 1989)

In the area of SO 23556 11483, a thicker unit of sandstone within the Middle coal measures can be examined in a series of small quarries. The grid reference given however refers to a particular small quarry where large fossil log casts can be seen.

There are a number of other points of interest at this site. There is a standing stone, known as "Carreg Maen Taro" (SO23821133) marked with a B and an M which marks the boundary between Monmouthshire and Breconshire but also marks the limits of the Blaenavon Ironworks lease.

Crossing the site from southwest to northeast is the Dyne Steel Incline. The section from the top of the hill to the Lamb and Fox Pub at Pwll Du was destroyed by the open cast work. The incline was half a mile long and is a double incline railway crossing from stretching from New Pit in Blaenavon to Pwll Du. The trucks were hauled up and down the incline by a central engine and winding drum. It was

designed and constructed by Thomas Dyne Steel who was engaged in 1850.(Govilon History <http://history.govilon.com/trail/purple/railway/>)

The importance of this site is further appreciated when it is considered in its wider environment. It is within the Blaenavon World Heritage site and forms a part of a tapestry of industrial exploitation over hundreds of years. These include the adjacent site of Pen-ffordd goch, to the east which is a Scheduled Ancient Monument preserving a legacy of iron stone exploration, using bell pits and scouring techniques. These were probable in operation from before the 17th century and continued to 1817. The limestone quarries to the north also provided limestone flux to the local steel works. These sites are well documented in books available from the World Heritage Centre book shop in Blaenavon.

References:

The Glamorgan – Gwent Archaeological Trust website:

http://www.ggat.org.uk/cadw/historic_landscape/blaenavon/english/Blaenavon_010.htm

BARBER, C. 2002. Exploring Blaenavon Industrial Landscape World Heritage Site.

Torfaen County Borough Council. 1999. Nomination of the Blaenavon Industrial Landscape for Inclusion in the World Heritage List.

BARCLAY, W J. 1989. Geology of the South Wales Coalfield. Part II, the country around Abergavenny, 3rd edition. Mem. Br. Geol. Surv. , Sheet 232 (England and Wales).

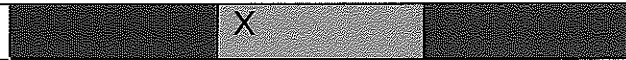
<http://history.govilon.com/trail/purple/railway/>

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:

Comment: Easily accessible via a network of rough paths

Safety:

Comment: The main causes for safety concerns at this site are the cliffs which should only be examined from a distance and from the motor bike which like to use the area.

Conservation status:

The site is at risk from companies wishing to extract coal which would change the character of the area. The features are also being eroded by excessive use of motor bikes on the site. The area falls within the Blaenavon World Heritage Site.

OWNERSHIP/PLANNING CONTROL:**Owner/tenant:**

Private.

Planning Authority: Torfaen County Borough Council and Monmouthshire County Council

Planning status/constraints/opportunities:

There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:

Present use: The site is open access "country side"

Site condition: Good, slightly overgrown and damaged by motor bikes

Potential threats: Encroachment of vegetation, renewed opencast, erosion from motor vehicles

Site Management: The site could be improved by work to remove some of the vegetation from key part of the site (would need to be done in consultation with biologist. The use of motor vehicles needs to be discouraged. The site is obviously well used by walkers and mountain bikers and it is thought that this activity could happily co-exist with conservation of the tips if thought is given to paths that avoid damaging the most interesting parts of the site.

SITE DEVELOPMENT:

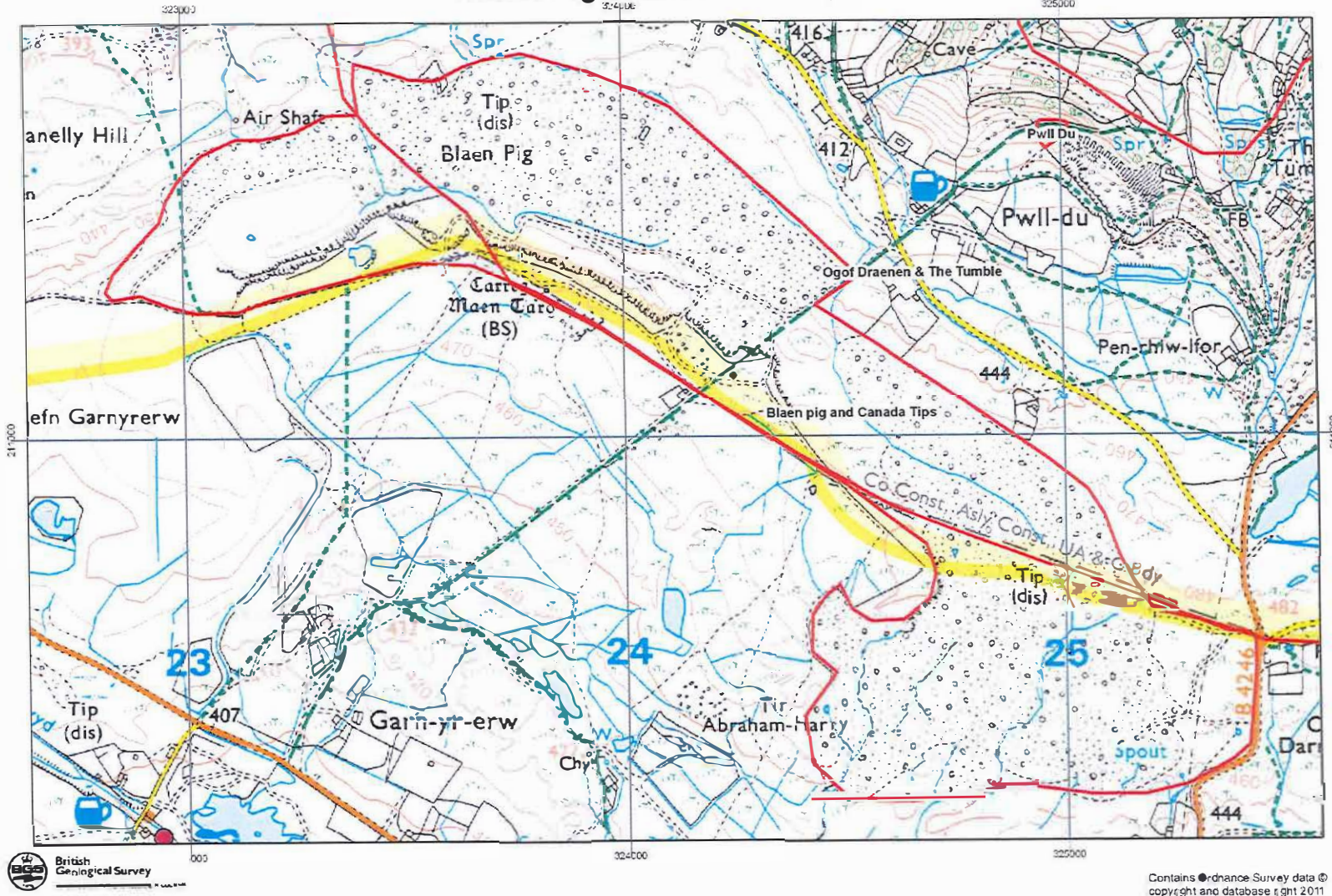
Potential use (general): The site could be developed with walks and paths to guide people safely to the most interesting parts of the sites with interpretation boards or leaflets linking in with other sites of interest with the world heritage site.

Potential use (educational): This site is a good place for students at any level to learn about Coal Measures geology and stratigraphy and well as the engineering

issues associated with opencast waste tips.

Other comments:

Blaen Pig and Canada Tips



Site Plan



South Wales RIGS Group Site Record RIGS Description

SECTION A

General	South Wales
Site Name: Craig Cynfyn Quarry	File Number: Site_RAW_JRD_31
RIGS Number: 609	Surveyed by: R A Waters and J R Davies
Grid Reference: SO 2716 0302	Date of Visit: 20 th October 2010
RIGS Category: Scientific	Date Registered: Owner: Unknown
Earth Science Category: Stratigraphical, sedimentological	Planning Authority: Torfaen County Borough Council
Site Nature: Disused quarry	Documentation prepared by: R A Waters
Unitary Authority: Torfaen County Borough Council	Documentation last revised: DIS 31 st January 2011
OS 1:50,000 Sheet: 171	Photographic Record: Embedded in text
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: E232	

RIGS Statement of Interest:

Craig Cynfyn Quarry forms part of a network of sites that demonstrates the stratigraphy and geological history of the Carboniferous Limestone on the east crop of the South Wales Coalfield. It has been proposed as a RIGS as it a very accessible site that provides an excellent section through the middle part of the Clydach Valley Subgroup that forms the upper part of the Carboniferous Limestone succession on the northern part of the east crop.

It exposes a continuous section that is somewhat overgrown in places. However, it is a very important site as the succession is completely dolomitised and shows three previously unrecognised oolitic units. It is therefore key to the understanding of the stratigraphy of the Clydach Valley Subgroup on the east crop. To date the succession in the area is poorly known and little understood, being shown as undivided on British Geological Survey maps.

It therefore provides a critical section for researchers to study the completely dolomitised Clydach Valley Subgroup. Furthermore, it is a good section for scientific research on the early dolomitisation of limestones, as a wide range of original limestone types are present. It is not considered suitable for students as some of the faces are too vegetated and the dolomite geology is not easy to demonstrate.

Geological setting/context:

Craig Cynfyn quarry comprises a northern and a southern bay, separated by a buttress. It offers a continuous section through the lower part of the Carboniferous Limestone on the northern part of the east crop of the South Wales Coalfield. In detail it exposes the middle part of the Couceyan Clydach Valley Subgroup, which is entirely dolomitised in this area (Barclay, 1989). Some 30 m of dolomites punctuated by three units of dolomitised oolitic limestone are exposed.

The lowest beds are only visible in the southern bay of the quarry. The lower 8.5 m comprise thin to medium bedded, fine-grained, medium to dark grey dolomites. Lamination and low amplitude, wave cross-lamination is common, while burrows are locally present. Crinoid ossicles are variably common, either scattered or more rarely as thin lags. Some of the lags have been silicified to give distinctive beds of lenticular chert that weather out of the face; three such beds are seen.

The dolomites are overlain by c. 9 m of dolomitised ooid grainstone and oolitic dolomites. The basal contact is slightly gradational with the underlying dolomites. Some of the ooid cortices are reddened and crinoid debris is locally common.

The top of the dolomitised oolite unit is sharp. Above is c 1.5 m of fine-grained dolomite followed by a metre-thick, distinctive coarsening-upwards unit of medium-grained, oolitic, shelly crinoidal dolomite. A bed of lenticular chert is present at the base. Above the oolite is a fining-upwards sequence, comprising 2.5 m of fine- to very fine-grained dolomites capped by a dolomite mudstone, that forms the first lift of the quarry. Possible cryptalgal lamination is present.

The succession above the first lift is not well exposed now due to vegetation but comprises 3.5 m of fine grained dolomites with *Syringopora* coral colonies and crinoid and shell debris passing up into c 3m of dolomitised oolite. The upper part of the oolite is rubbly and resembles that beneath a palaeokarst.

The lower dolomitised oolite is considered to be the Blaen Onnen Oolite and the underlying dolomite the Pantydarren Formation. Although Barclay (1989) did not recognise oolitic textures he suggested that the crinoidal rich dolomites between the two chert horizons equated with the Blaen Onnen Oolite. Above the Blaen Onnen Oolite, the two further dolomitised oolites that are exposed show features which are dissimilar to the Gilwern Oolite, the youngest of the oolites in the Clydach Valley Subgroup, as neither have erosive bases or are thick enough. Furthermore, the Gilwern Oolite has been mapped to the east of the quarry (Barclay 1989). These oolitic units therefore predate the Gilwern Oolite and are at present unnamed.

Each oolitic unit of the Clydach Valley Subgroup represents a barrier shoal deposit behind which a dolomite unit accumulated. Thus each dolomite/oolite couplet represents a transgressive - progradational (regressive) cycle. Each transgression began with back barrier deposits, followed by deposition of ooid grainstones in a barrier setting. At the high point of the transgression the barrier began to prograde back south, leaving an emergent land surface behind it. Evidence for subaerial exposure is only seen in the quarry in the highest oolite. The shelly, crinoidal dolomite units with tractional structures were deposited in a shelf lagoon subject to storm events as manifested by the crinoidal/shelly lags. The thin unit of dolomite mudstones and very fine-grained dolomites between the two uppermost oolites may be peritidal in origin. Considerably more work is needed to understand the sedimentology of the

dolomite units.

The dolomitisation of the peritidal deposits was probably penecontemporaneous in a tidal flat environment subject to evaporation and/or an influx of fresh water from the land. The remaining dolomites are pervasive and stratabound. They probably reflect the movement of a mixing zone of fresh and marine waters through the host sediment (Hird et al., 1987) to give early dolomitisation of the sediments. The position of the mixing zone would have fluctuated with sea level movements and temporal variations in climate.

References:

BARCLAY, W J. 1989. *Geology of the South Wales Coalfield, Part II, the country around Abergavenny* (Third edition). Memoir of the British Geological Survey, Sheet 232 (England and Wales). (London: HMSO.).

HIRD, K, TUCKER, M E and WATERS R A. 1987. Petrography, geochemistry and origin of Dinantian dolomites from South-east Wales. 359-77 *in* European Dinantian environments. MILLER, J, ADAMS, A E and WRIGHT, V P. (editors). *Geological Journal Special Issue* No 12. (Chichester: John Wiley).

SECTION B

PRACTICAL CONSIDERATIONS:			
Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X
Comment: Footpaths lead from B4246 road all round quarry, including top lift.			
Safety:		X	
Comment: Scrambling up scree and buttress necessary to see complete succession.			
Conservation status:			
Unknown			

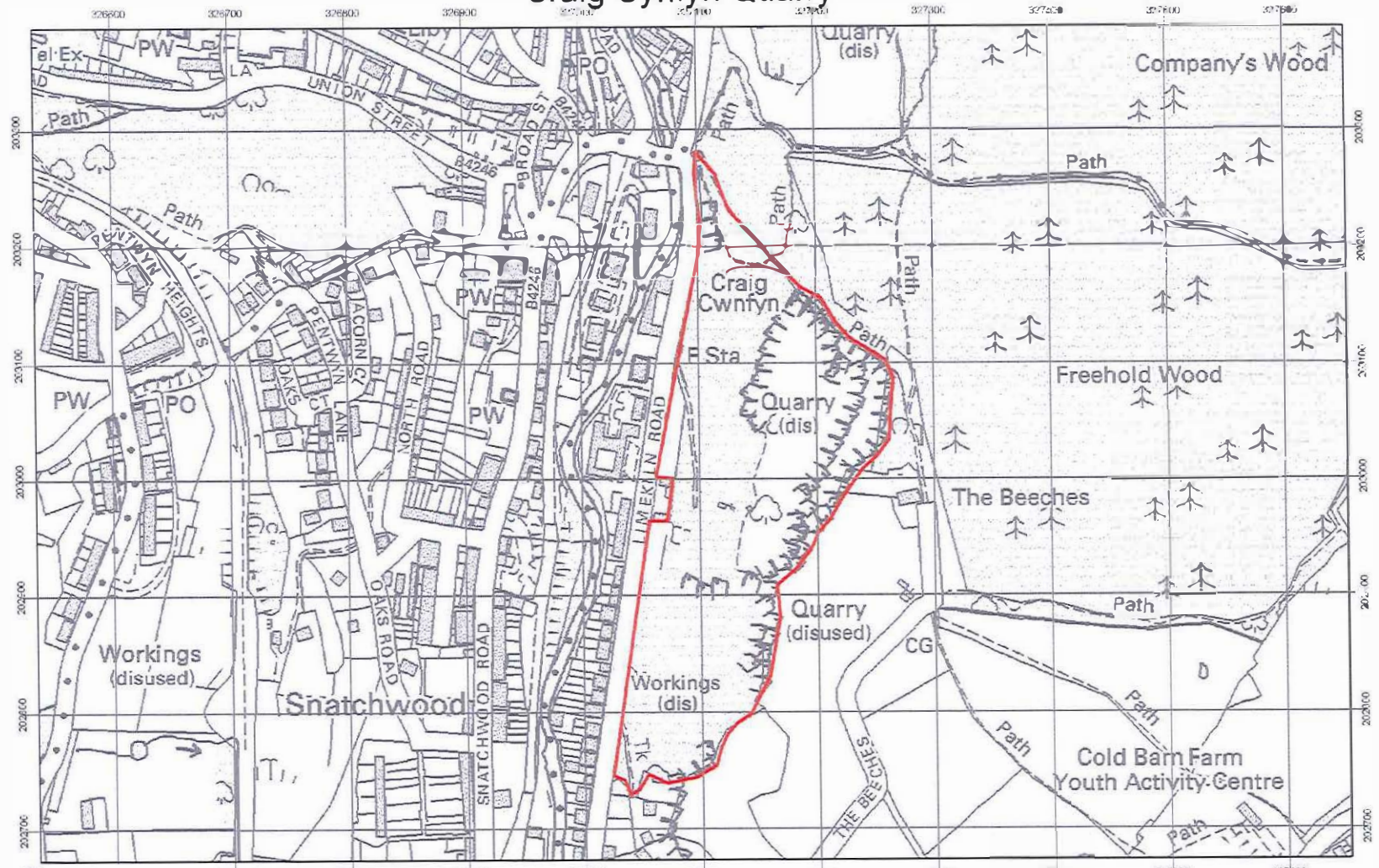
OWNERSHIP/PLANNING CONTROL:
Owner/tenant: Unknown
Planning Authority: Torfaen County Borough Council
Planning status/constraints/opportunities:
Unknown, but unlikely quarrying will ever recommence

CONDITION, USE & MANAGEMENT:
Present use: Disused quarry with public access via footpaths
Site condition: Quarry floor now extensively covered by small trees and saplings making access to faces difficult in places.
Potential threats: Tree growth may eventually make access to faces locally impossible in places if not checked.
Site Management: Suggest selected parts of site adjacent to faces are cleared of vegetation periodically.

SITE DEVELOPMENT:
Potential use (general):
Potential use (educational):
Key site for researchers investigating the stratigraphy and sedimentology of the Clydach Valley Subgroup in the dolomitised east crop of the South Wales Coalfield. Also good site for researching dolomitisation processes.

Other comments

Craig Cynfyn Quarry





South Wales RIGS Group Site Record RIGS Description

SECTION A

General	South Wales
Site Name: Cwmynyscoy Quarries East	File Number: Site RAW JRD 56
RIGS Number: 629	Surveyed by: R A Waters and J R Davies
Grid Reference: ST 2832 9938	Date of Visit: 20 th October 2010
RIGS Category: Scientific, educational	Date Registered:
Earth Science Category: Stratigraphical, sedimentological, industrial	Owner: Torfaen County Borough Council/Countryside Council for Wales Planning Authority: Torfaen County Borough Council
Site Nature: Disused quarry/crop working	Documentation prepared by: R A Waters
Unitary Authority: Torfaen County Borough Council	Documentation last revised: 2 nd February 2011
OS 1:50,000 Sheet: 171	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: 249	
RIGS Statement of Interest:	
<p>Cwmynyscoy Quarries East forms part of a network of sites on the east crop of the South Wales Coalfield that demonstrate the stratigraphy and geological history of the Carboniferous Limestone. It has been proposed as a RIGS as an accessible site that provides a good section through the upper part of the Avon Group and lowermost part of the Clydach Valley Subgroup which form the lowermost part of the Carboniferous Limestone succession in the area. The site is also part of a local nature reserve which is open to the public.</p> <p>The site is the type locality for the Cwmynyscoy Mudstone, the upper formation of the Avon Group. The site is important as sections in this mudstone-dominated unit are very uncommon. It therefore provides an excellent locality for the scientific study of the stratigraphy and sedimentology of the unit at its type locality. It also provides an exposure of the contact with the overlying Sychnant Dolomite Formation. This contact is of great interest to researchers investigating the geological history and sedimentology of the Clydach Valley Subgroup as it represents a step change in the environment of deposition of the rocks.</p> <p>The site is also a good one for students to study marine mudstones rich in shelly fossils, and see an example of crop working of a thin limestone formation.</p>	

Geological setting/context:

Cwmynyscoy Quarry East offers a section through the lowest part of the Carboniferous Limestone on the northern part of the east crop of the South Wales Coalfield. It exposes a partial section through the early Courceyan Avon Group that here comprises the Castell Coch Limestone overlain by the Cwmyniscoy Mudstone Formation. The lowest part of the overlying Clydach Valley Group is also seen.

The quarry was worked for the 15 m-thick Castell Coch Limestone by a 300 m-long crop working. It has been partly backfilled on various occasions, the last being during the creation of the nature reserve. Today, approximately 10 m of thick bedded Castell Coch Limestone is seen at the southern end of the crop working, but it is very poorly exposed due to dense trees and bushes growing adjacent to the faces and could not be accessed during the visit. The quarry is the type section for the overlying Cwmyniscoy Mudstone (Waters et al., 2009) which is partially exposed on the western side of the southern end of the crop working. The quarry has been described by Squirrel and Downing (1969) (as Cwm quarries) and by Burchette (1987).

Squirrel and Downing (1969) recorded the Cwmyniscoy Mudstone as 21 m thick in the quarry, but today only the uppermost part is exposed near the top of the west face, the lower part of the face being degraded and overgrown. It comprises 6 m of buff weathering, grey crumbly mudstones with scattered sheet-like beds of variably dolomitised limestones, 2-10 cm thick. The limestones comprise shelly crinoidal packstones and fine-grained packstone. Some beds are graded. Squirrel and Downing (1969) report a varied fauna, dominated by brachiopods. The base of the overlying Courceyan Clydach Valley Subgroup is sharp. Only the basal 5 m is seen and this comprises medium bedded fine-grained dolomites referable to the Sychnant Dolomite Formation.

The Cwmyniscoy Mudstone was deposited in an open marine setting, seaward of any barriers. It represents a major transgression that flooded the barrier shoals of the underlying Castell Coch Limestone. The mudstones comprise the background sediment being deposited on the ramp, while the limestones reflect storm activity that brought bioclastic debris from nearer shore environments to deposit them as event beds further offshore. The sharp contact with the Sychnant dolomite probably reflects shallowing as a result of progradation. The dolomite is presumed to have been deposited front barrier.

References:

BURCHETTE, T P. 1987. Carbonate –barrier shorelines during the basal Carboniferous transgression: the Lower Limestone Shale Group, South Wales and western England. 239-63 *in* European Dinantian environments. MILLER, J, ADAMS, A E and WRIGHT, V P. (editors). *Geological Journal Special Issue No 12*. (Chichester: John Wiley).

SQUIRRELL, H C, and DOWNING, R A. 1969. Geology of the South Wales Coalfield, Part I, the country around Newport (Mon). 3rd edition. *Memoir of the Geological Survey of Great Britain, Sheet 249 (England and Wales)*.

WATERS, CN, WATERS, RA, BARCLAY, WJ, and DAVIES, J R, 2009. Stratigraphical framework for Carboniferous successions of Southern Great Britain (Onshore). *British Geological Survey Research Report, RR/09/01*.

SECTION B

PRACTICAL CONSIDERATIONS:			
Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X
Comment: Open to public as a Local Nature Reserve			
Safety:		X	
Comment: Some quarry faces sloping and crumbly; vertical ones need examining for stability. Access to some faces via scree slopes needs care.			
Conservation status:			
Site is currently part of Cwmyrnyscoy Local Nature Reserve			

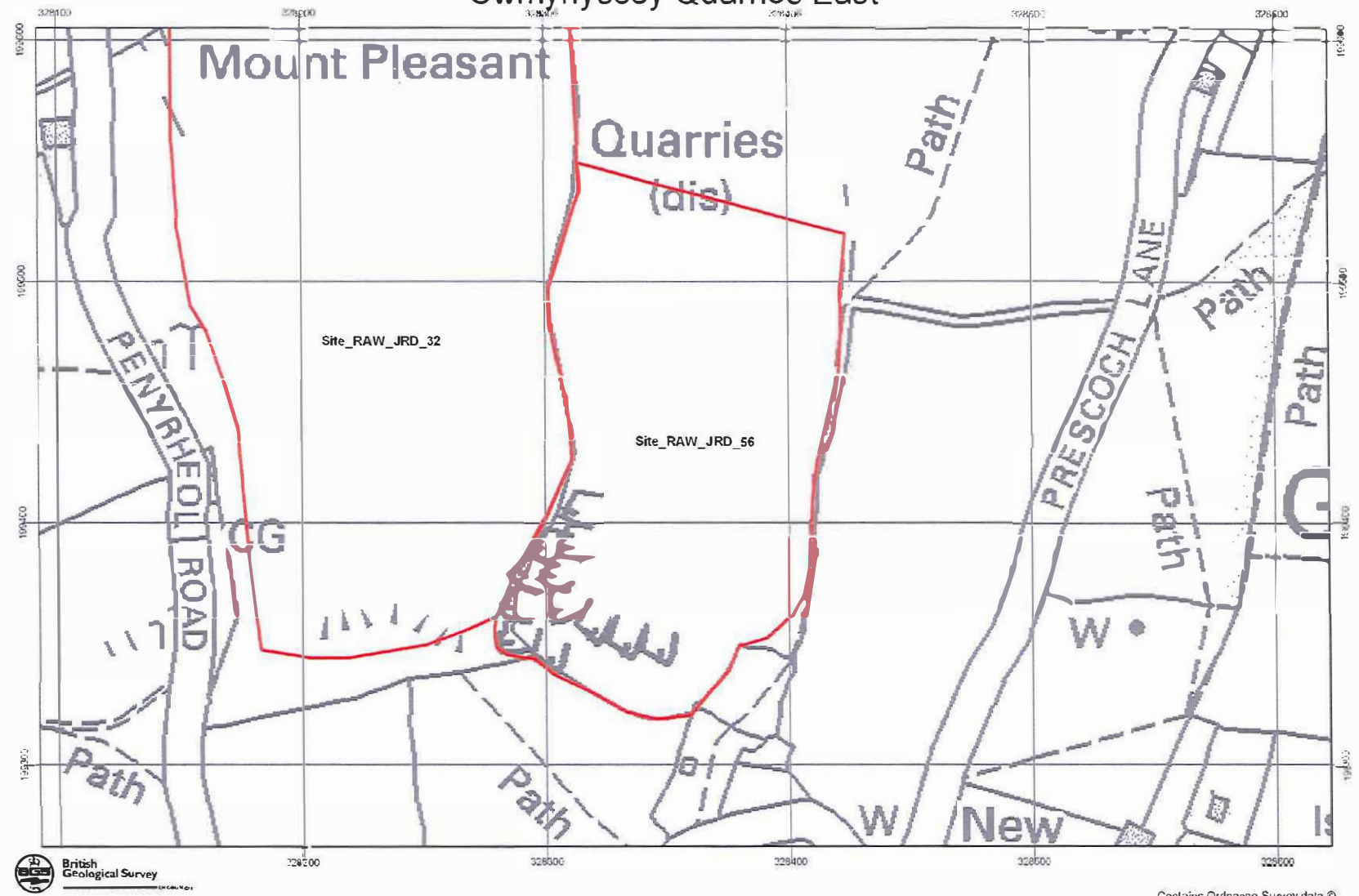
OWNERSHIP/PLANNING CONTROL:
Owner/tenant: Torfaen County Borough Council /Countryside Council for Wales
Planning Authority: Torfaen County Borough Council
Planning status/constraints/opportunities:
Site is currently part of Cwmyrnyscoy Local Nature Reserve

CONDITION, USE & MANAGEMENT:
Present use: Disused quarries/crop workings, that have been partly backfilled. Currently part of a local nature reserve.
Site condition: Quarry faces partially obscured by bushes, saplings and trees.
Potential threats: increasing vegetation growth.
Site Management: Selected parts of the quarry faces should be cleared of vegetation

SITE DEVELOPMENT:
Potential use (general):
Potential use (educational): Good site for those undertaking scientific research into the sedimentology and stratigraphy of the Cwmyrnyscoy Mudstone and Sychnant Dolomite. Also a good site for students to study marine mudstones with a varied shelly fauna and dolomites. It also provides an example of crop working of a thin geological unit.

Other comments:

Cwmyrnscoy Quarries East





South Wales RIGS Group Site Record RIGS Description

SECTION A

General	South Wales
Site Name: Cwmynyscoy Quarries West	File Number: RAW JRD 32
RIGS Number: 610	Surveyed by: R A Waters and J R Davies
Grid Reference: ST 2820 9950	Date of Visit: 20 th October 2010
RIGS Category: Scientific, educational	Date Registered:
Earth Science Category: Stratigraphical, sedimentological	Owner: Torfaen CBC/CCW/Hanson Planning Authority: Torfaen County Borough Council
Site Nature: Part disused quarry/local nature reserve, small part is a mothballed quarry	Documentation prepared by: R A Waters
Unitary Authority: Torfaen County Borough Council	Documentation last revised: 2 nd February 2011
OS 1:50,000 Sheet: 171	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: E249	
<p>RIGS Statement of Interest: Cwmynyscoy Quarries West forms part of a network of sites on the east crop of the South Wales Coalfield that demonstrate the stratigraphy and geological history of the Carboniferous Limestone. It has been proposed as a RIGS as it is an easily accessible site that provides a good section through most of the Clydach Valley Subgroup, which forms the upper part of the Carboniferous Limestone succession in this area. The site is also part of a local nature reserve which is open to the public.</p> <p>It shows a nearly continuous section that is somewhat overgrown in places. However, it is a very important site as the succession is completely dolomitised and shows three previously unrecognised oolitic units. It is therefore a key site for understanding the stratigraphy and sedimentology of the Clydach Valley Subgroup on the east crop. To date, the succession in the area is poorly known, being shown as undivided on British Geological Survey maps.</p> <p>The Cwmynyscoy Quarries West site thus provides a critical section for researchers to study the completely dolomitised Clydach Valley Subgroup. It is also a good section for scientific research on the early dolomitisation of limestones, as a wide range of original limestone types are present.</p>	

Geological setting/context:

Cwmyrnyscoy Quarries West offers a nearly continuous section through the upper part of the Carboniferous Limestone on the northern part of the east crop of the South Wales Coalfield. In detail it exposes most of the Courceyan Clydach Valley Subgroup (Barclay, 1989). Some 50 m of dolomites punctuated by four units of dolomitised oolitic limestone are exposed. Squirrell and Downing (1969) described the quarry but only recorded the lowest oolite.

The lowest part of the succession is seen in a small upper quarry at the south end of the main face. The lowest beds exposed are calculated to be approximately 10 m above the top of the underlying Cwmyrnyscoy Mudstone at the top of the Avon Group. At the base, the Sychnant Dolomite Formation comprises finely laminated dolomite, siltstone and mudstone with local wave ripple cross-lamination and bioturbation. Packets of sheeted, dolomitised bioclastic packstone/grainstone punctuate the formation. Squirrell and Downing (1969) record a varied brachiopod fauna from these beds. The overlying Pwll-y-Cwm Oolite (5.5 m thick) has a sharp base and top and comprises locally dolomitised ooid grainstone. About 2 m of the overlying Panydarren Formation is seen above and comprises dolomite siltstones and mudstones with replacive chert nodules.

The main (lower) quarry exposes the remaining part of the Panydarren Formation but there is an exposure gap of around 2m between the two quarries. The formation comprises variably bioturbated fine-grained dolomite with planar, wave cross-lamination and possibly hummocky cross-stratification. Scattered lags of coarse crinoidal/oolitic dolomite, commonly replaced by chert are present throughout, increasing in abundance upwards into the overlying Blaen Onnen Oolite. The latter is approximately 9 m thick and comprises cross bedded dolomitised ooid grainstone.

Above a sharp top to the Blaen Onnen Oolite are 3.5 m of fine-grained dolomites with scattered crinoid debris and cherts passing up into a 4.5 m thick oolitic unit. The latter is capped by coarse dolomite overlain by an undulatory palaeokarst and green clay palaeosol. Above the palaeosol are more crinoidal fine-grained dolomites punctuated by a 1.5 m dolomitised ooid grainstone.

The oolitic units above the Blaen Onnen Oolite are not like the Gilwern Oolite, the youngest of the oolites in the Clydach Valley Subgroup, as neither have erosive bases or are thick enough. They therefore predate the Gilwern Oolite and are at present unnamed, as are the intervening dolomites. The top of the Clydach Valley Group is probably not seen in the area of the quarry due to overstep at the base of the Namurian, which occurs just to west of the quarry.

Each oolitic unit of the Clydach Valley Subgroup represents a barrier shoal deposit behind which a dolomite unit accumulated. Thus each dolomite/oolite couplet represents a transgressive - progradational (regressive) cycle. Each transgression began with back barrier deposits, followed by deposition of ooid grainstones in a barrier setting. At the high point of the transgression the barrier began to prograde back south, leaving an emergent land surface behind it. Evidence for subaerial exposure is only seen in the quarry above the third oolite. The dolomite units with tractional structures were deposited in a back barrier shelf lagoon, subject to storm events as manifested by the crinoidal/oolitic lags. Considerable more work is needed to understand the sedimentology of the dolomite units.

The dolomitisation of the back barrier sediments and the ooid grainstones probably reflects the movement of a mixing zone of fresh and marine waters through the host sediment (Hird et al., 1987). The position of the mixing zone would have fluctuated with sea level movements and temporal variations in climate. Such dolomitisation is thought to have occurred early during diagenesis.

References:

BARCLAY, W J. 1989. *Geology of the South Wales Coalfield, Part II, the country around Abergavenny* (Third edition). Memoir of the British Geological Survey, Sheet 232 (England and Wales). (London: HMSO.).

HIRD, K, TUCKER, M E and WATERS R A. 1987. Petrography, geochemistry and origin of Dinantian dolomites from South-east Wales. 359-77 *in* European Dinantian environments. MILLER, J, ADAMS, A E and WRIGHT, V P. (editors). *Geological Journal Special Issue* No 12. (Chichester: John Wiley).

SQUIRRELL, H C, and DOWNING, R A. 1969. *Geology of the South Wales Coalfield, Part I, the country around Newport (Mon)*. 3rd edition. *Memoir of the Geological Survey of Great Britain, Sheet 249 (England and Wales)*.

SECTION B

PRACTICAL CONSIDERATIONS:			
Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X
Comment: Site is a nature reserve open to the public. However, faces are commonly obscured by trees and bushes. A small part at the northern end is a fenced and mothballed quarry with plant.			
Safety:		X	
Comment: Quarry faces need examining for stability. Some faces can only be accessed via a steep scree/debris slope			
Conservation status:			
Most of quarry is within the Cwmyrnyscoy Local Nature Reserve			

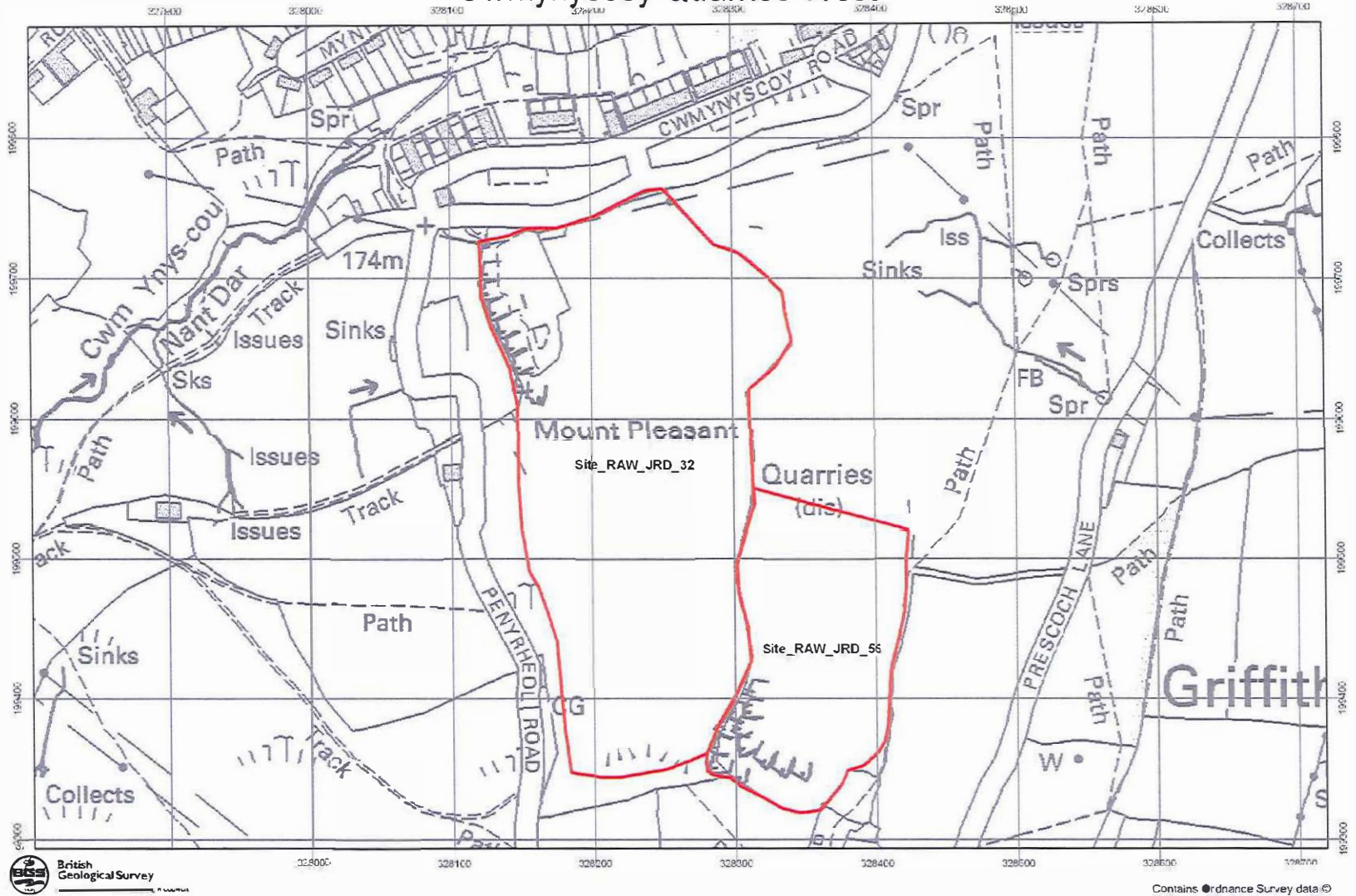
OWNERSHIP/PLANNING CONTROL:
Owner/tenant: Nature reserve -Torfaen CBC and CCW. Mothballed quarrye- Hanson Ltd
Planning Authority: Torfaen County Borough Council
Planning status/constraints/opportunities:
Site is currently part of Cwmyrnyscoy Local Nature Reserve. Mothballed quarry with plant may have permission for some industrial activity.

CONDITION, USE & MANAGEMENT:
Present use: Local Nature Reserve with small part as mothballed quarry with plant.
Site condition: Central part of quarry has been backfilled and landscaped prior to making it a nature reserve. Trees and bushes have grown in a belt adjacent to the main quarry face making access difficult for much of the section.
Potential threats: Increasing vegetation
Site Management: Selected parts of the quarry faces should be cleared of vegetation.

SITE DEVELOPMENT:
Potential use (general):
Potential use (educational): Key site for the scientific study of the stratigraphy and sedimentology of the dolomitised Clydach Valley Subgroup.

Other comments:

Cwmyncyoy Quarries West





South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Llanhilleth (Tirpentwys)	File Number: Site BIGC_11
RIGS Number: 589	Surveyed by: Rhian Kendall, David Roberts
Grid Reference: SO 2340 0140	Date of Visit: 30 th September 2010
RIGS Category: Scientific	Date Registered:
Earth Science Category: Stratigraphic, sedimentological	Owner: Unknown Planning Authority: Torfaen County Borough Council and Caerphilly County Borough Council
Site Nature: Disused Quarry	Documentation prepared by: Rhian Kendall
Unitary Authority: Torfaen County Borough Council and Caerphilly County Borough Council	Documentation last revised: 24 th March 2012
OS 1:50,000 Sheet: 171	Photographic Record: Embedded in text
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: 232/249	
RIGS Statement of Interest:	
<p>This site has been proposed as a RIGS as it is a good example of the Grovesend Formation of the Warwickshire Group in South Wales. It provides over 1km of exposure between the Mynnydd Islwyn and Small Rider Coals, providing opportunity to study this formation and the sedimentology of sediments deposited on alluvial floodplains in overbank lake environments. This site would also be of interest to engineering geology students.</p> <p>This site is however dangerous to access at present due to loose overhanging faces and work would need to be done to make the site safe before any studies could be made.</p>	

Geological setting/context:

The Grovesend Formation is the youngest of the Carboniferous units exposed in the South Wales Coalfield. The Formation is typically argillaceous, being made up of Mudstones and siltstones with lithic sandstone layers of Pennant Sandstone type, which can be locally thick. This formation does contain coals although they are not typically thick or economically important in the past. (Waters et al 2009) "The Grovesend Formation was deposited on alluvial floodplains in an overbank lacustrine environment." (Waters et al 2007)

The distribution of the Grovesend Formation is restricted to small areas within the coalfield where it is preserved in faulted blocks and the cores of synclines

The Llanhilleth disused opencast site exposed the Grovesend Formation between the Mynnydd Islwyn and Small Rider Coal seams. BGS, in 1969, described a section of Small Rider Measures:

- 1.2m Mudstone with plants
- 1.95m Sandstone
- 0.42m Rashings, inferior Coal in the Middle
- 0.47m Seat Earth
- 1.45m Silty sandstone with roots
- 1.44m Mudstones with plants seat earth above
- 0.16m Coal
- >1.52m Seat Earth

The following section was described near the central road that runs north south through the site:

Continuous exposure in opencast backwall:

- 8m Sandstone, erosive base
- 0.3m Rashings
- 2.33m Seat-earth, silty below
- 1.85m Silty Mudstones
- 0.28m Sandstone, fissile
- 0.02m Clay
- 0.39m Coal
- 0.46m Seat Earth
- 4.2m gap
- 19m Well bedded sandstone
- 0-0.75m Mudstone
- 0.36m Grey shales containing Leiaia
- 1.83m Barren mudstone
- 0.09m Grey shales containing Leiaia
- 0.38m Mudstones with macerated plants
- >0.98m Coal

This section thought the Grovesend Formation is thought to be the longest continuous exposure of rocks of this in this part of the South Wales coalfield, at over 1km long. It is also important as other good outcrops of this formation are in the South of the

coalfield. The Grovesend Beds at this site are dominantly sandstones and are well bedded and with strong cross beds, all of which is heavily cut by systematic sub vertical joint sets. The rock splits easily along the bedding and is micaceous. The dip is not easy to determine but remote generalised measurements suggest a dip of about 10 degrees on a bearing of 240 degrees. This is out of the rock face which will add to the degree of instability. At the eastern end of the site the base of the sandstones is seen to overly a black fissile shale where the dip can be determined on a highly uneven sandstone base as about horizontal. The large cross beds give an impression that the dip is into the rock face. It would be dangerous to collect data or samples from the rock face in its present condition. The main danger is from toppling failure of the rock face especially where sub vertical joints which dip steeply into the rock face have opened and large blocks are now in a very unstable condition.

This site is extremely dangerous with many overhanging, unstable faces and should only be accessed by professional geologists and ground engineers who would need to evaluate how to make the faces safe if any studies are to be made in it. All investigations of the faces should be undertaken remotely with the use of binoculars.

The pool at the base of the face is deep enough to drown in and the edges are treacherous with loose, moss covered rocks and a very soft base. A narrow path across the old tip area makes easier access though the site but this too has its potential dangers because loose sandstone blocks are becoming liberated from the more easily eroded shale. Above the tip area to the south is a mature pine forest which screens the site from the road. These trees are gradually colonising the rest of the site as well as a variety of deciduous species many of which are rooted in joints on the rock face.

Before any research work is undertaken at this locality it must be made safe.

Development of this site for aggregate extraction could provide an opportunity, in consultation with operators for a safer environment to which examine the Grovesend Formation. Operators should be encouraged, in their plans to make good after extraction, to leave safe faces for further study.

References:

SQUIRRELL, H C and DOWNING, R A. 1969. Geology of the South Wales Coalfield, Part I, the country around Newport (Mon), Memoir IGS sheet 249 (third edition)

WATERS, C N, WATERS, R A, BARCLAY, W J, and DAVIES, J R. 2009. A lithostratigraphical framework for the Carboniferous successions of southern Great Britain (Onshore). British Geological Survey Research Report, RR/09/01.

WATERS, C N, BROWNE, M A E, DEAN, M T, and POWELL, J H, 2007. Lithostratigraphical framework for Carboniferous successions of Great Britain (Onshore). British Geological Survey Research Report, RR/07/01.

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:

Comment: See site description

Safety:

Comment: See site description

Conservation status:

There are no known conservation designations of this RIGS

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Unknown

Planning Authority: Torfaen County Borough Council and Caerphilly County Borough Council

Planning status/constraints/opportunities:

It is understood that this has been an application to extract aggregate at this site at the time of writing.

CONDITION, USE & MANAGEMENT:**Present use:**

Site condition: Disused quarry

Potential threats: The site is presently dangerous and may be filled in

Site Management: This site is dangerous at present to access and so it is recommended that faces be made safe and kept clear of vegetation to allow safe access to the faces. It is also advised that any extraction of aggregate from this site be done so with a mind to leave some faces that maintain access to the interest in this quarry, ie the Grovesend Formation.

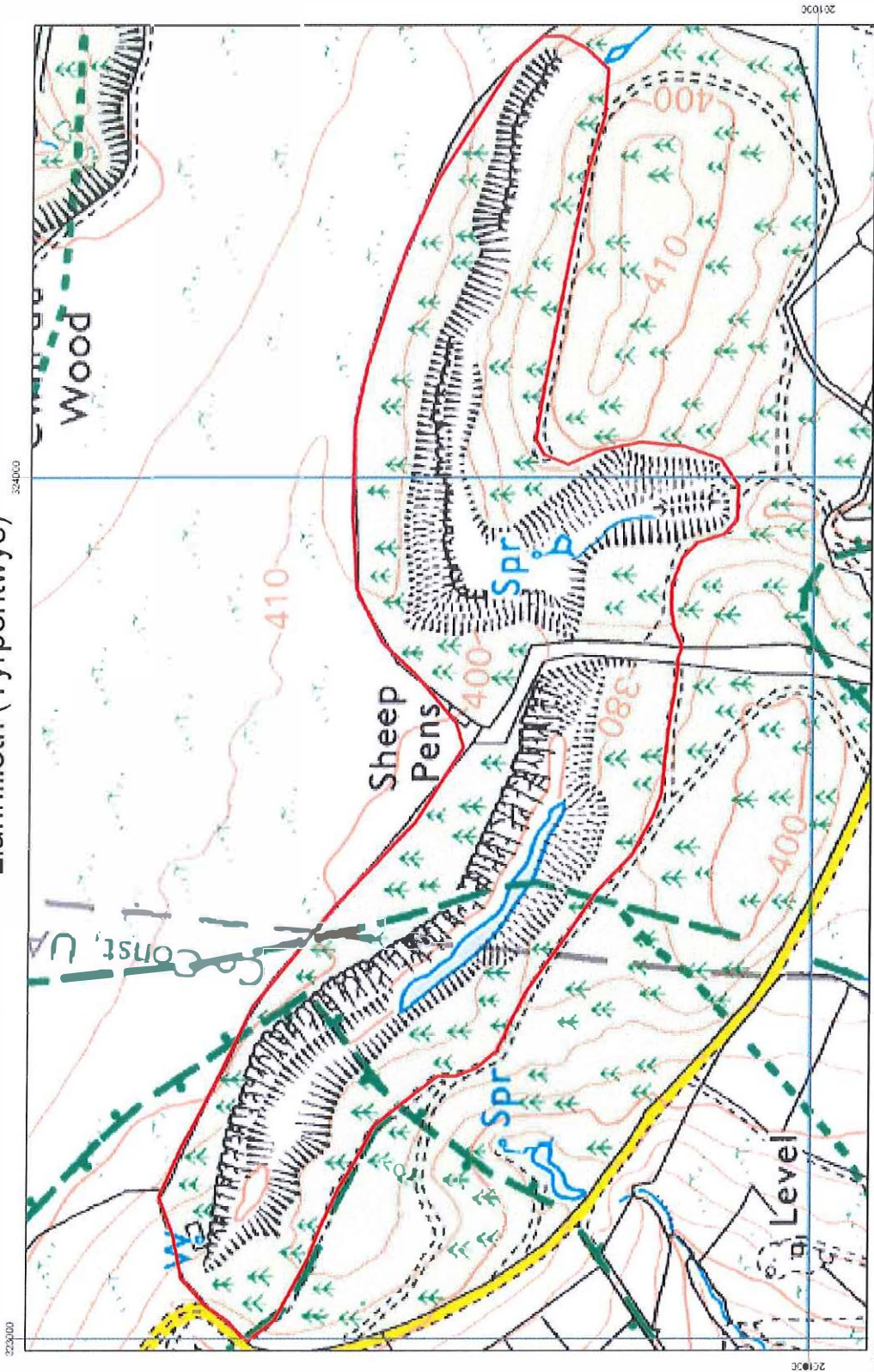
SITE DEVELOPMENT:**Potential use (general):**

Potential use (educational): The site could be used by geology students, studying the Grovesend Formation and/or sedimentology.

Other comments:

Site Plan

Llanhilleth (Tyrpentwys)



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South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Pontnewynydd Risings	File Number: Site_karst_17
RIGS Number: 577	Surveyed by: Andy & Rhian Kendall
Grid Reference: SO 2745 0190	Date of Visit: 18 th July 2010
RIGS Category: Scientific	Date Registered:
Earth Science Category: Karst	Owner: Welsh Water Planning Authority: Torfaen County Borough Council
Site Nature: Spring	Documentation prepared by: A Kendall
Unitary Authority: Torfaen County Borough Council	Documentation last revised: 20 th June 2011
OS 1:50,000 Sheet: 171	Photographic Record: See attached
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: 232	
RIGS Statement of Interest:	
<p>This is a water extraction site with no visible geology. It is however important as an industrial site and also in relation to the Ogof Draenen Cave system which it is the resurgence for.</p>	

Geological setting/context:

This is an active resurgence at the lowest point of the Carboniferous limestone in this valley.

The site is an important part of the development of the Ogof Draenen cave system as it is the activation of this resurgence that apparently drains the system in an extremely rapid time and causes the main river passage to form at a different roof level to the prior northwards flowing Gilwern passage. The resurgence is some 140m lower and 8km distant from the last accessible part of the cave, Rifleman's choke.

Dye from ogof Draenen is seen at Snatchwood Bridge (100 hours, dye seen at the resurgence despite the long flow-through time) and Pontnewynydd (104 hours)

References:

WALTHAM, A, SIMMS, M, FARRANT, A & GOLDIE, 1997, GCR Karst Review, Chapman & Hall, London

GASCOIGNE, W. 1995. Dye traces in Ogof Draenen. *Caves and Caving*, 69:19–21

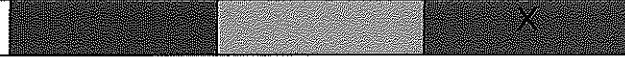
http://www.oucc.org.uk/dtt/vol05/dtt5_05.htm as at 20 June 2011

<http://www.cavinguk.co.uk/draenen/> as at 20 June 2011

FARRANT and MAURICE (Eds) 2011 *Cave and Karst Science* Vol 38 part 1. Thematic Issue: Ogof Draenen — Britain's longest cave

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:

Comment: Building in locked compound

Safety:

Comment:N/A

Conservation status:

There are no known conservation designations of this RIGS

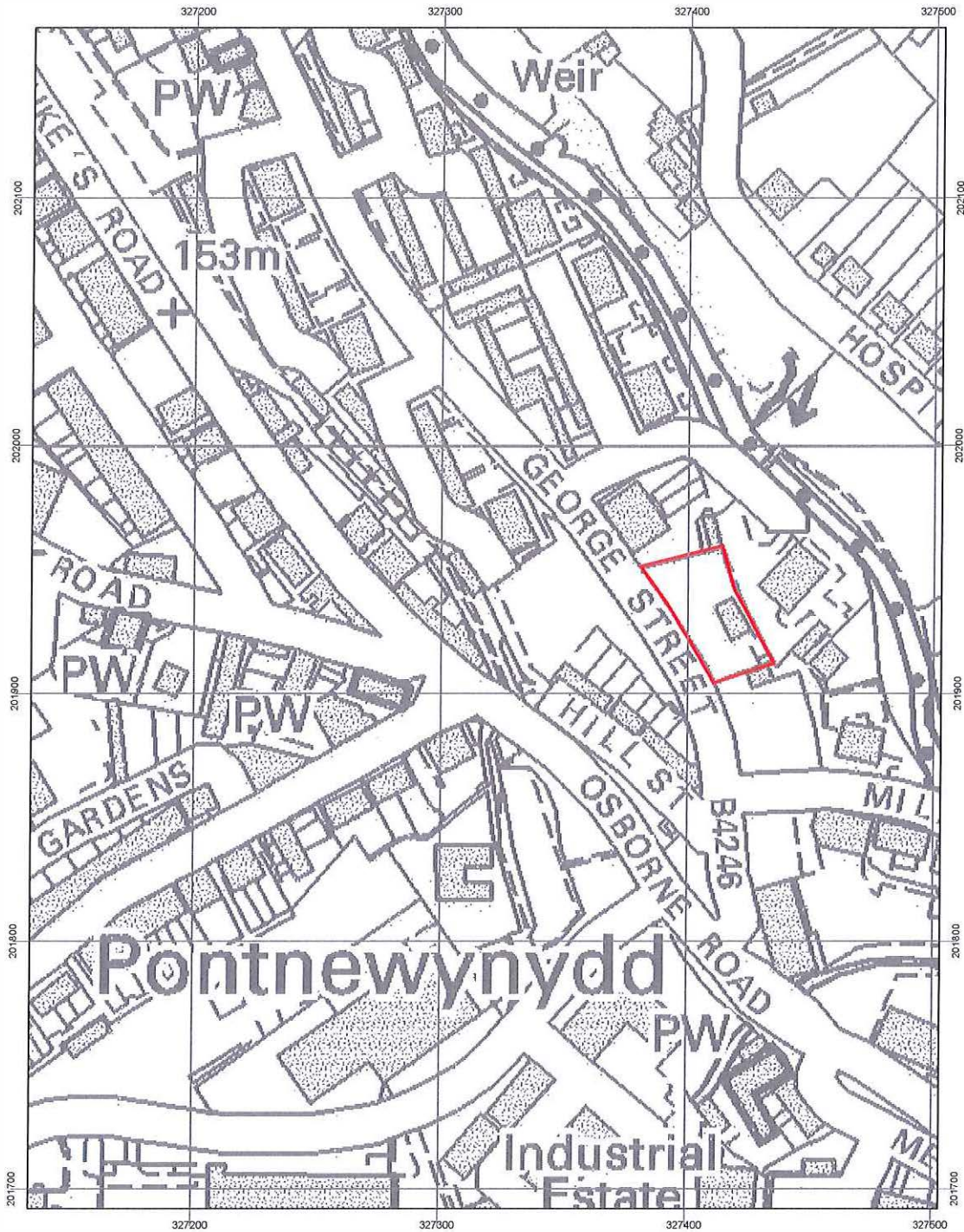
OWNERSHIP/PLANNING CONTROL:**Owner/tenant:** Welsh Water**Planning Authority:** Torfaen County Borough Council**Planning status/constraints/opportunities:**

There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:**Present use:** Water extraction**Site condition:** Built structure over the geological feature**Potential threats:** None**Site Management:** None**SITE DEVELOPMENT:****Potential use (general):** None**Potential use (educational):** None**Other comments:**

Site Plan

Pontnewydd Risings



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