



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Tongwynlais – Castell Coch View	File Number: Site_CCC_80
RIGS Number: 630	Surveyed by: South Wales Geologists' Association
Grid Reference: ST 1348 8228 to ST 1346 8228	Date of Visit: 21 st April 2009
RIGS Category: Scientific	Date Registered:
Earth Science Category: Stratigraphical and Mineralogical	Owner: Unknown Planning Authority: Cardiff County Council
Site Nature: Disused quarries	Documentation prepared by: Rhian Kendall
Unitary Authority: Cardiff County Council	Documentation last revised: 31 st January 2011
OS 1:50,000 151	Photographic Record: Attached
OS 1:25,000	
BGS 1:50,000 E263	
RIGS Statement of Interest:	
<p>This site has been chosen as a RIGS for two main reasons. First because it exposes the Rhiwbina iron ore (a subdivision of the Avon Group; Tongwynlais Formation) and secondly because it provides the opportunity to examine the sequence of rocks at the Devonian Carboniferous boundary.</p>	

Geological setting/context:

These extensive workings are much overgrown but exhibit exposures in the Upper Old Red Sandstone (Devonian) and Lower Limestone Shales (Carboniferous, Avon Group) which are relatively rare. This site exposes a succession within the southern limb of the Tongwynlais Syncline and makes an alternative to the SSSI site in the Taff Gorge where a similar stratigraphy is exposed. The Devonian-Carboniferous boundary is also exposed at this locality with the transition from non marine clastic sediments to a marine carbonate environment. The contact between the two systems is 2.6m below that chosen by earlier workers (Gayer *et al.*). This is at the base of the Tongwynlais Formation which is made up of bioclastic limestones and shales with 12m of a more variable unit at its base (Cossey *et al.*, 2004). The Avon Group, of which the Tongwynlais Formation is a part, was largely deposited in a marine setting and records an early Dinantian, northward-directed marine transgression. Davies *et al.* (1991).

"The uppermost Devonian in the region, is known as the Quartz Conglomerate Group and is comprised of locally pebbly multi-storey sandstone units with siltstones and quartz conglomerates. The unit passes gradationally into the Lower Limestone shales... The group is thought to have been deposited in a fluvial environment. The upper boundary of this group is taken where the sequence changes from one dominated by sandstones to the dominantly grey shales and interbedded limestones of the Tongwynlais Formation." Waters and Lawrence (1987).

The Rhiwbina Ironstone occurs within the Tongwynlais Formation of the Avon Group and records a transgressive event in which a rapid deepening of the basin caused a reduction in sediment supply. These conditions encouraged early cementation of the sediments and iron impregnation." Davies *et al.* (1991). It is approx 0.6m thick regionally, red, crinoidal biosparite with a thin conglomerate at its base. The red colour is attributed to the presence of haematite either as a pellet coating around fossils, infilling parts of crinoids and bryozoans, as replacement on crinoids or bryozoans calcite or as irregular masses of fine grained haematite. This variability along with there being no haematite in the matrix indicates that the rock is made up of derived clasts and that the haematite source is elsewhere. Gayer *et al.* (1973).

"Only a single example of a "Fossil Ore" facies ironstone, the Rhiwbina Ironstone, has been recorded in Great Britain. Trials were excavated to evaluate the deposit, but there is no evidence that it was ever worked commercially.....The Rhiwbina Ironstone lies at the base of the Tongwynlais Fm in the Cardiff area. It forms part of the early Carb.. transgression of the ORS landmass in South Wales. The ironstone was generated in what appears to be the most significant of the pulses of the Courceyan transgression, not during the initial development of marine lagoonal facies, but during the spread of open-shelf conditions over the site of the former lagoon." Young 1993

Location 1 (see annotated map) Exposes Upper Old Red Sandstone, red sandstone and conglomerates with dips of 18° and 30° recorded by BGS.

Location 2 Outcrop in the back garden of the third house in the street exposes Upper

Old Red Sandstone, grey and brown thinly bedded sandstones. The succession does not reach the Carboniferous Limestone.

Location 3 Small east west trending workings/ditch with a small limestone outcrop at the eastern end.

Location 4 Steep slope, exposing Tongwynlais Formation in a section, at times obscured in vegetation. The lowest rocks encountered in the sequence are limestones. A short sequence near the top of the slope exposes approx 30cm of limestone (including slickenside's), overlain by approx 50cm of calcareous mudstone and finally a sequence of approx 1.57m of ironstone bands (ST 1348 8228). This section may extend down into the upper old red sandstone but the site would need clearance work to prove this. The Ironstone dips at 30° @ 342°N.

Beyond the north of the site (excluded because of the difficulty of access), there are exposures of fine sandstones, some with rounded quartz pebbles, which exhibit good cross bedding in places (Upper Old Red Sandstone) which dip at 10° at 132°S. There is an exposure of the Avon Group Rhiwbina Ironstone at ST 1348 8228 and the section in this one part may extend down into the Upper Old Red Sandstone but needs clearance to prove.

References:

WATERS, R A and LAWRENCE, D J D. 1987. Geology of the South Wales Coalfield, Part III, the country around Cardiff

GAYER, R A, ALLEN, K C, BASSETT, M G and EDWARDS, D. 1973. The Structure of the Taff Gorge area, Glamorgan, and the stratigraphy of the Old Red Sandstone - Carboniferous Limestone transition.





SQUIRRELL, H C and DOWNING, R A. 1969. Geology of the South Wales Coalfi

DAVIES J R, MCNESTRY A M and WATERS R A. 1991. Palaeoenvironments and palynofacies of a pulsed transgression: the late Devonian and early Dinantian (Lower Carboniferous) rocks of southeast Wales

COSSEY, P J, ADAMS, A E, PURNELL, M A, WHITELEY, M J, WHYTE, M A and WRITE VP. British Lower Carboniferous Stratigraphy. Geological Conservation Review, JNCC. 2004

YOUNG, T. 1993. Sedimentary Iron Ores by Chap. 9 in Mineralization in the British Isles Patrick RAD and Polya DA (eds) Chapman & Hall

SECTION B

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:		X	
Comment: Very overgrown and within gardens in parts			
Safety:		X	
Comment: Very steep and slippery in places.			
Conservation status: The gardens of Castell Coch View are being extended into the old quarry workings either for use as garden space or to tip garden refuse.			

OWNERSHIP/PLANNING CONTROL:
Owner/tenant: Unknown
Planning Authority: Cardiff County Council
Planning status/constraints/opportunities: There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:
Present use: None. Land is left wild with house owners extending their gardens into the quarries
Site condition: Very poor. Vegetation, rubbish and garden landscaping is obscuring the outcrop.
Potential threats: Encroachment of gardens
Site Management: Educate home owners about the site and encourage them to keep faces clear for study

SITE DEVELOPMENT:
Potential use (general):
Potential use (educational): This site could be used as a resource for scientific research and public education about the Devonian Carboniferous Boundary and the Rhiwbina Ironstone
Other comments:

Photographic Record



Rhiwbina Ironstone bands in Tongwynlais Formation at location 4
Photograph by Lynda Garfield

Annotated Sketch