South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Llangammach Quarry	**File Number**: Site_RAW_JRD_17
RIGS Number: 710	**Surveyed by:** R A Waters and J R Davies
Grid Reference: SN 9374 4720	**Date of Visit:** 21st January 2011
RIGS Category: Scientific, educational	**Date Registered:**
Earth Science Category: Stratigraphic, sedimentological, palaeontological	**Owner:** Unknown **Planning Authority:** Powys County Council
Site Nature: Disused quarry	**Documentation prepared by:** R A Waters
Unitary Authority: Powys County Council	**Documentation last revised:** 8th March 2012
OS 1:50,000 Sheet: 147	**Photographic Record:** Attached
OS 1:25,000 Explorer Sheet: 188	
BGS 1:50,000 Sheet: E196	

RIGS Statement of Interest:

Llangammach Quarry is part of a network of sites demonstrating the evolution of the south-east margin of the Lower Palaeozoic Welsh Basin during the mid to late Silurian. Although it is an existing palaeobotanical GCR site for non calcareous algae (Cleal and Thomas 1995), little was known at the time about the background geology. Following the geological mapping of the area (British Geological Survey 2005, Schofield et al 2004), the background geology is now available. This RIGS description provides that information.

The quarry exposes a succession of early Ludlow, deep water marine mudstones (Irfon Formation) with both derived and indigenous fossils. The indigenous graptolite faunas are prolific and provide an excellent locality to study the basal Ludlow fauna. Several slumps present record tectonic instability at the margin of the Welsh Basin. The quarry is a key site in that it demonstrates the rise in sea level at the beginning of the early Ludlow and displays the type of muddy sediments that were deposited in the Welsh Basin at this time.

It provides an excellent section for those interested in scientific research into the stratigraphy, palaeontology and sedimentology of the late Silurian. As a GCR site it is not suitable for student parties.

Geological setting/context:

Llangammach Quarry is a palaeobotanical GCR site for *Powysia bassettii,* one of the two non calcareous algae described from the Silurian (Cleal and Thomas 1995). At the time the Palaeozoic palaeobotany GCR volume was written, little was known of the background geology, other than the rocks were graptolitic mudstones of earliest Ludlow age. The quarry is also described in two field guides (Bassett 1993, Siveter et al 1989). Since then, the area has been mapped (British Geological Survey 2005, Schofield et al 2004) and the geological setting and context of the site can now be added under the RIGS process.

The quarry is an accessible roadside section, very near the base of the late Silurian (early Ludlow) Irfon Formation. The quarry exposes c. 30 m of steeply dipping, grey, thinly flaggy, weakly silt-laminated, very silty mudstones. Apart from the orange weathering silt laminae, the mudstones are diffusely laminated throughout. Also present are widely spaced, mm-thick dark, grey anoxic laminated hemipelagites, that yield abundant graptolites and as well as othoconic nautiloids and cardiolid bivalves. A few scattered thin sandstones up to 3 cm thick are also seen. They contain shelly lags rich in brachipods and crinoid material. Slump units up to a metre thick punctuate the quarry succession. They comprise chaotically bedded mudstones with randomly orientated carbonate nodules. The graptolites demonstrate the quarry belongs to the basal Ludlow *nilssoni* Biozone (Bassett 1993, Siveter et al 1989, Schofield et al 2004).

In the Llangammach area, the Irfon Formation overlies the slumped mudstones of the Cae Beris Member of the Llangammach Formation that record the late Wenlock, Homerian regression in a mid ramp setting. The lower part of the Irfon represents renewed transgression and deepening. The mudstones of the formation record silt-based event beds emplaced by low concentration density currents, possibly storm induced. The thin sandstones are of similar origin, simply representing more energetic events that brought in derived shelfal faunas. The anoxic hemipelagites represent the background mid ramp sediments. The thin slumps in the formation are probably the result of contemporaneous tectonic activity along the Llandrindod-Pen-y-Waun fault belt (Schofield et al, 2004) affecting a rapidly accumulating and progading prism of muddy sediments.

References:

BASSETT, M G. 1993. The Silurian of the Newbridge-Built-Eppynt area. 281-300 in *Geological Excursions in Powys*. WOODCOCK, N H and BASSETT, M G. (editors) (Cardiff: University of Wales Press, National Museum of Wales)

British Geological Survey. 2005**.** *Builth Wells. England and Wales Sheet 196, Solid geology, 1: 50 000.* British Geological Survey: Nottingham

CLEAL, C J and THOMAS, B A. 1995. *Palaeozoic paleobotany of Great Britain*. Geological Conservation Review Series, No 9. (London: Chapman and Hall).

SCHOFIELD, D I, DAVIES, J R, WATERS, R A, WILBY, P R, WILLIAMS, M and WILSON, D. 2004. Geology of the Builth Wells District – a brief explanation of the geological map. *Sheet Explanation of the British Geological Survey*. 1:50 000 Sheet 196 Builth Wells

SIVETER, D J, OWENS, R M & THOMAS, A T. 1989. Silurian field excursions. A geotraverse across Wales and the Welsh Basin. *National Museum of Wales Geological Series* No. 10, 131 pp.

SECTION B

PRACTICAL CONSIDERATIONS:
Please score Accessibility and Safety Red Amber or Green

Accessibility:			X
Comment: Quarry is by roadside but gated and permission from owner is required			
Safety:			X
Comment: Quarry floor is partly cluttered with piles of logs and building materials. Quarry faces need examining for stability.			

Conservation status:

Palaeobotanical GCR site (Cleal and Thomas 1995)

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Unknown

Planning Authority: Powys County Council

Planning status/constraints/opportunities:

This is a Palaeobotanical GCR site (Cleal and Thomas 1995)

CONDITION, USE & MANAGEMENT:

Present use: Disused quarry, now used for storage of logs and building materials.

Site condition: South faces partially obscured by vegetation; north face partially obscured by log store

Potential threats: increasing use as a storeage site making access to faces difficult; increasing vegetation obscuring faces

Site Management: GCR conditions should be checked by CCW. Storeage should be managed so that faces are not obscured; vegetation should be periodically cleared from faces.

SITE DEVELOPMENT:

Potential use (general):

Potential use (educational): It provides an excellent section for those interested in scientific research into the stratigraphy, palaeontology and sedimentology of the mid to late Silurian. As a GCR site it is not suitable for student parties.

Other comments:

Photographic Record

General view of quarry, showing steeply dipping mudstones.

Steeply dipping, thinly flaggy mudstones in the north-east corner of the quarry.