South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Scrach Quarry, Crychan Forest	**File Number:** Site_RAW_JRD_6
RIGS Number: 643	**Surveyed by:** J R Davies and R A Waters
Grid Reference: SN 8471 3962	**Date of Visit:** September 2010
RIGS Category: Scientific, educational	**Date Registered:**
Earth Science Category: Stratigraphical, sedimentological	**Owner:** Forestry Commission **Planning Authority:** Carmarthenshire County Council
Site Nature: Forestry quarry	**Documentation prepared by:** J R Davies
Unitary Authority: Carmarthenshire County Council	**Documentation last revised:** 27th January 2011
OS 1:50,000 Sheet: 160	**Photographic Record:** Attached
OS 1:25,000 Explorer Sheet: 187	
BGS 1:50,000 Sheet: E213	

RIGS Statement of Interest: This site forms part of a network of early Silurian sites (RIGS and GCR) in the type area for the Llandovery Series. Collectively, these sites represent the key sections in the local geology that underpin its international importance and demonstrate the results of significant recent discoveries.

Scrach Quarry represents an eastwards extension to an existing GCR site, the Scrach track cutting. This was described by Aldridge et al. (2000) based on accounts by Cocks et al. (1984) and Siveter et al. (1989). The new site has been described in detail and its significance explained by Davies et al. (2009) as part of their revision of the local late Ordovician (Hirnantian) stratigraphy in the Type Llandovery area. This work investigated strata deposited during, and immediately after, the end Ordovician glacial period and the influence of associated marine regressions and transgressions. Earlier authors (Cocks et al., 1984; Woodcock and Smallwood, 1987) viewed their 'Scrach Formation' as the product of shallow water deposition during the peak of a global marine lowstand. The angular unconformity exposed in Scrach Quarry was key to reinterpretation of this succession as the overlying boulder conglomerate and wave influenced shallow marine sandstones were more recently recognised as having been deposited during the post-glacial marine transgression. As a result the term 'Scrach Formation' was abandoned in the studies of Davies et al. (2009; 2010; in press).

The quarry provides an accessible and educationally significant exposure of these recently discovered features which underpin the need for the adjacent GCR site to be extended and its description and relevance revised.

Geological setting/context:

Track sections in Crychan Forest in the vicinity of the Scrach Quarry site formed the type locality for the 'Scrach Formation' as erected and described by Cocks et al. (1984) (see also Woodcock & Smallwood, 1987). This Hirnantian (late Ordovician) division was viewed by these authors as having been deposited during a period of lowered sea level, part of the global response to a widely acknowledged glacial episode during that time. Wave rippled sandstones and, in some sections, a distinctive brachiopod assemblage (the cool water 'Hirnantia Fauna') were taken to record shallow water conditions that pervaded at a time when glaciers were at their maximum extent. In erecting it as a GCR, Aldridge et al. (2000) cited the westerly dipping succession of interbedded mudstones and thin lenticular sandstones exposed along the Scrach forestry track section as typical of this synglacial facies and event. The section extends westwards into the overlying, post-glacial, Type Llandovery succession.

The exposures in Scrach Quarry (Figure 1; Photos. 1 & 2), immediately to the east of the GCR track section, were unavailable or unseen by earlier workers, and necessitated a radial re-appraisal of the local Hirnatian stratigraphy (Davies et al., 2009). The quarry reveals an angular unconformity between steeply dipping beds and an overlying more shallowly dipping succession which includes a distinctive boulder conglomerate at its base (Photo. 2). The lower steeply dipping unit comprises purple-stained silty mudstones with thin beds of sandstone rich in fine, orange-weathering, shell debris. Local mapping supports the inclusion of these mudstones in the local Tridwr Formation (BGS, 2005a, b; Barclay et al., 2005). Above the unconformity, the basal conglomerate is up to 0.5 m thick and includes deeply weathered bounders of volcanic rock and sandstone. An overlying decalcified shelly sandstone is succeeded by sandstone beds with convolute and hummocky cross stratification and units in which thin, lenticular, wave-rippled sandstones are interbedded with smooth grey mudstones. The latter is the dominant facies in the upper part of the section which, to the west of the quarry, joins with the existing GCR site. A small fault with a 1.2 m downthrow to the north crosses the quarry face (Photo. 1).

Davies et al. (2009) argued that the unconformity exposed in Scrach Quarry records a period of deep erosion that was the product of the late Ordovician glacial event. The overlying conglomerates and sandstones, clearly transgressive in nature, must post date the glacial maximum and record the earliest of several global rises in sea level that followed. These basal sandstones and conglomerate equate with the Cwm Clyd Sandstone of nearby areas and the succeeding mudstone-rich facies, deposited in deepening water, comprise the Garth House Formation (Schofield et al., 2004; Barclay et al., 2005). These exposures and their interpretation undermine the earlier definition and usage of the term 'Scrach Formation' and Davies et al. (2009) recommended its abandonment.

Scrach Quarry is a key section in the Type Llandovery area and underpinned the revision of the local and regional Hirnantian stratigraphy advanced by Davies et al. (2009; 2010; in press). Together with RIGS site RAW_JRD_7, the relationships visible at this section allowed these authors to demonstrate that previous accepted correlations of the shelf succession in the Llandovery area with that of the main Welsh Basin to the north-west were flawed and that the established stratigraphical nomenclature for these strata requires significant amendment.

References:

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SECTION B

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X
Comment: Readily accessible forestry quarry. May be periodically inaccessible due to forestry operations			
Safety:			X
Comment: Forestry track; need to be aware of periodic forestry operations and traffic			
Conservation status: Extension of existing GCR site			

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Forestry Commission

Planning Authority: Carmarthenshire County Council

Planning status/constraints/opportunities:

There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:

Present use: Abandoned forestry quarry

Site condition: Currently very good; all key contacts and features are visible.

Potential threats: Prone to become overgrown and vegetated. Hammering of basal conglomerate must be prohibited if critical relationships are to be preserved.

Site Management: Requires growth of vegetation to be controlled if critical contacts are to remain visible. However, careful clearing immediately prior to periods of study remains a viable, if time consuming option.

SITE DEVELOPMENT:

Potential use (general):

Potential use (educational): Good potential as site exposing a critical angular unconformity, overlying boulder conglomerate and upward transition into shallow marine sandstones and mudstones. Visits by large parties should be discouraged however, and hammering prohibited.

Other comments:

Photographic Record

Photograph 1. Scrach Quarry, Crychan Forest; note small fault (left of right-hand spade handle) downthrowing to the right (north)

Photograph 2. Close-up of unconformity (at hand level) between steeply dipping Tridwr Formation (below) and boulder conglomerate at base of the Cwm Clyd Sandstone.

Annotated Sketch

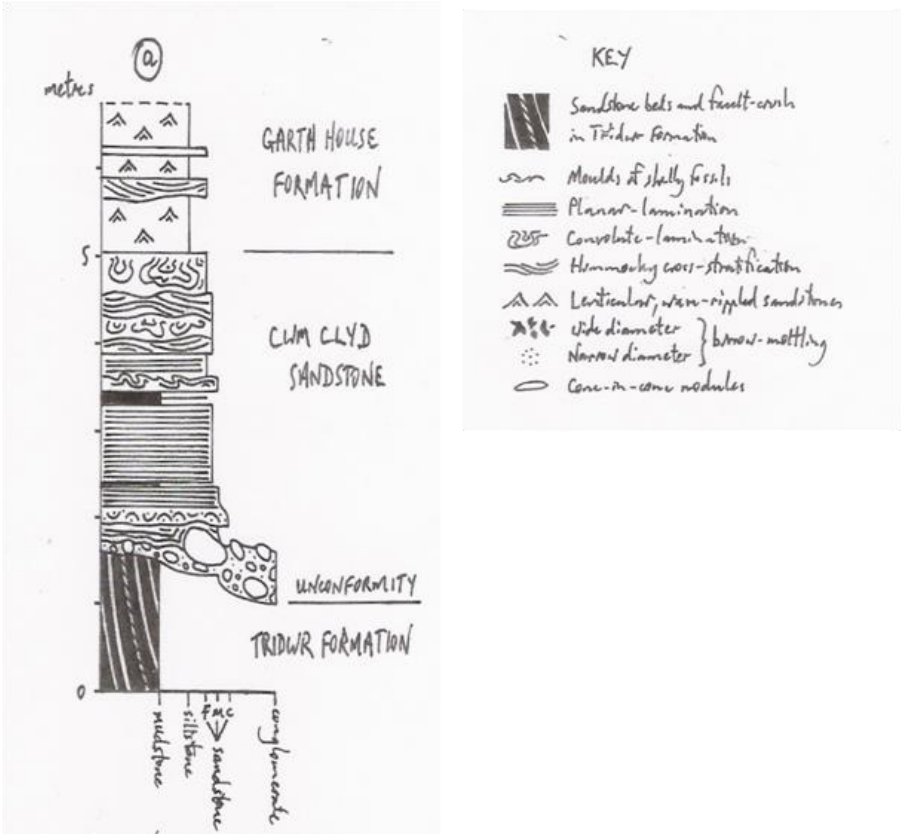

Figure 1. Log of Scrach Quarry section (also known as Crychan Forestry Quarry) (see Davies et al. (2009).