South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Friars Point coastal cliffs	**File Number:** Site_RAW_JRD_40
RIGS Number: 615	**Surveyed by:** R A Waters and J R Davies
Grid Reference: ST 1072 6641 – 1111 6585	**Date of Visit:** 7th October 2010
RIGS Category: Scientific, educational	**Date Registered:**
Earth Science Category: Stratigraphical, palaeontological, sedimentological,	**Owner:** Unknown **Planning Authority:** Vale of Glamorgan
Site Nature: Coastal cliffs and reefs	**Documentation prepared by:** R A Waters
Unitary Authority: Vale of Glamorgan Council	**Documentation last revised:** 22nd February 2012
OS 1:50,000 Sheet: 171	**Photographic Record:** Attached
OS 1:25,000 Explorer Sheet: 151	
BGS 1:50,000 Sheet: 263	

RIGS Statement of Interest:

Friars Point coastal cliffs form part of a network of sites that demonstrate the stratigraphy and geological history of the Carboniferous Limestone on the south crop of the South Wales Coalfield. It has been proposed as a RIGS as it is an accessible site, with public access, that provides a key section for those interested in the stratigraphy, sedimentology, mineralogy and paleontology of the lower part of the Carboniferous Limestone. Although, the site lies within the limits of the Barry Island, Triassic red bed GCR site (Benton et al. 2002), the Carboniferous rocks are restricted to the cliff top.

The site exposes c. 310 m of continuous section through the uppermost part of the Barry Harbour Limestone and most of the Friars Point Limestone. The locality is the type section for Friars Point Limestone. A range limestone lithologies and sedimentary structures, including cross bedding and burrowing, demonstrate, two major regional changes of sea level. The fossils from the section, notably corals and conodonts, have been studied in detail and as a result the site is one of the best dated sections in South Wales for this time interval. The section is as good as the GCR site in Gower at Three Cliffs Bay (Adams et al. 2004) that includes the Friars Point Limestone. Therefore the section should be regarded as an alternative to that site.

Not only does it provide a key section for scientific research, it also provides an excellent section for students to study, limestones, sedimentary structures and fossil corals.

Geological setting/context:

Friars Point is a coastal section of low cliffs and reefs exposing an excellent, continuous section through most of the Black Rock Subgroup. The uppermost part of the Barry Harbour Limestone and most of the overlying Friars Point Limestone is exposed. The site is the type locality for the Friars Point Limestone and the thickest development of the formation in the South West Dinantian Province. The site lies within the Barry Island, Triassic red bed GCR site (Benton et al. 2002), breccias of the Triassic Mercia Mudstone Group marginal facies unconformably overlying the Friars Point Limestone along the cliff top for the northern half of the section. The site is described in detail in Waters and Lawrence (1987). The following formations are exposed:

Pembroke Limestone Group

Black Rock Subgroup

Friars Point Limestone	c. 300 m +
Barry Harbour Limestone	c. 10 m +

Only the uppermost part of the Barry Harbour Limestone is seen at the northern end of the section south of the breakwater. The early Courceyan formation predominantly comprises thin to medium bedded packstones with shaly partings. The packstones are commonly arranged in graded units, comprising basal brachiopod and crinoid rich lags passing up into fine-grained skeletal packstone. The fine-grained packstones are commonly dolomitised and exhibit HCS and planar and cross-lamination. Burrowing is common as is silicification. At the top of the formation is a 5 m-thick bed of massive, planar cross-bedded crinoidal grainstone known as the Yorke Rock Bed.

The Barry harbour Limestone was deposited above storm wave base and not far below fair weather wave base. The Yorke Rock Bed records shallowing on the inner mid ramp, the bed recording deposition within fair weather wave base. The bed correlates with the Brofiscin Oolite seen further north up the ramp

Above the Yorke Rock Bed, the Friars Point Limestone begins with a return to packstones very similar to those of the Barry Harbour Limestone for some 20 m. However, they are rapidly replaced upwards by darker, foetid, thin bedded argillaceous variably crinoidal packstones with abundant shaly partings. All trace of tractional lamination has gone and burrowing is common. The packstones comprise coarslely crinoidal lags, interbedded with very fine to fine-grained, partly streaky, laminated skeletal packstone and subordinate packstone /wackestone. About 115 m above the base of the formation is a 10 m thick packet with replacive chert nodules. Above this level the packstones become thicker bedded and more bioturbated. Beds of packstone are up to 1.8m thick and homogenised by the intense burrowing. Clots and wisps of crinoidal and other bioclastic debris float in a finer grained matrix and record winnowed lags that have been thoroughly disrupted by burrowing

The Friars Point Limestone has been dated here using corals and conodonts (Waters and Lawrence 1987, Mitchell 1981) and ranges from mid Courceyan to early Chadian. The site is one of the few sections in the Dinantian South West Province where the base of the Chadian (= base Visean) has been recognised. The coral faunas are very

prolific, the lowest 45 m of the formation being characterised by small zaphrentid corals and the remainder by large caniniod corals. The uppermost part of the formation is not exposed at Friars Point. This part of the formation elsewhere is dolomitised.

The onset of the formation records a major transgression in the mid Couceyan with continued deepening resulting in deposition in the deeper part of the outer mid ramp, predominantly below mean storm wave base.

References:

ADAMS, A, WRIGHT, V P and COSSEY, P J. 2004. South Wales – Mendip shelf. 393- 476 *in* British Lower Carboniferous Stratigraphy. Cossey, P J, Adams, A E, Purnell, M A, Whiteley, M J, Whyte, MA, and Wright, V P. (editors). *Geological Conservation Review Series,* No 29. (Peterborough: Joint Nature Conservation Committee).

BENTON, M J, COOK, E and TURNER P. 2002. Permian and Triassic red beds and the Penarth Group of Great Britain. *Geological Conservation Review Series* No. 24, Joint Nature Conservation Committee, Peterborough.

MITCHELL, M. 1981. The distribution of Tournaisian and early Visean (Carboniferous) coral faunas from the Bristol and South Wales areas of Britain. *Acta Palaeontolgica Polonica*, 25, 577-585.

WATERS, R A, and LAWRENCE, D J D. 1987. *Geology of the South Wales Coalfield, Part III, the country around Cardiff.* (Third edition). Memoir of the British Geological Survey, Sheet 263 (England and Wales).

SECTION B

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

Accessibility:			X
Comment: Cliffs are low and can be accessed by scrambling. Entire area is public access.			
Safety:			X
Comment: Care needed on reefs covered with seaweed; care needed when scrambling on low cliffs			

Conservation status:

Site is part of the Barry Island Triassic red bed GCR (Benton et al. 2002)

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Unknown

Planning Authority: Vale of Glamorgan Council

Planning status/constraints/opportunities:

Site is part of the Barry Island Triassic red bed GCR (Benton et al. 2002)

CONDITION, USE & MANAGEMENT:

Present use: Public open space

Site condition: Most cliffs/reefs clean in south part of section but seaweed is locally a problem in obscuring reefs in the intertidal zone in the north.

Potential threats: None

Site Management: No suggestions

SITE DEVELOPMENT:

Potential use (general):

Potential use (educational): It provides a key section for scientific research on the stratigraphy, sedimentology and palaeontology of the Black Rock Subgroup. It also provides an excellent section for students to study, limestones, sedimentary structures and fossil corals.

Other comments:

Photographic Record

General view of lower part of section (looking north towards Yorke Rock). Black Rock Subgroup occupies the reefs and Triassic rocks the cliff top.

Upper part of section (looking north towards Friars Point). Thick bedded Friars Point Limestone.

Richly crinoidal packstone with corals and bryozoa in the Friars Point Limestone