

Hydrogeology of Wales: Precambrian and Cambrian aquifers

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This page is part of a category of pages that provides an updated review of the occurrence of groundwater throughout Wales.

Author(s): N S Robins and J Davies, British Geological Survey

Contributor(s): D A Jones, Natural Resources Wales and G Farr, British Geological Survey



Typical Cambrian coastal exposure looking towards South Stack, Holyhead Island. P802417.

Precambrian strata crop out in Anglesey (**Plate P802417**), in the Lleyn Peninsula and Bardsey Island, and in Pembrokeshire between St Brides Bay and Fishguard (P841814). They are nevertheless of limited areal extent.

The Monian Composite Terrain of Anglesey and the Lleyn Peninsula comprises a varied suite of tectonised igneous, metamorphic and sedimentary rocks. These diverse lithological elements were brought together in a belt of transcurrent faulting during the late Precambrian and early Cambrian ([Gibbons, 1983](#)). There are three main divisions of the Cambrian Monian Supergroup in Anglesey ([Greenly, 1919](#)):

- the South Stack Group deformed metasediments – interbedded greywacke sandstones, siltstones and pelites
- the New Harbour Group greenschists and volcanoclastic sandstones – quartz-veined chlorite-mica schists grading upwards into metamorphosed massive, volcanoclastic sandstones and schistose pelites
- the Gwna Group comprising diverse clasts in a slaty mudstone and siltstone matrix

All three are present on Holyhead Island, Anglesey, while the Gwna Group also outcrops in central and eastern Anglesey and in the Lleyn Peninsula. In addition the granitic and dioritic Sarn Complex occurs in the Lleyn Peninsula whereas the Coedana Complex gneisses and Coedana granite are present in Anglesey. In north-western Snowdonia the Padarn Tuff Formation, the lowest part of the

Arfon Group, comprises strongly welded, acidic ash-flow tuffs.

The Peibidian Supergroup of Pembrokeshire comprises a series of unmetamorphosed acid to intermediate tuffs, lavas and tuffaceous sediments, intruded by quartz porphyry and granophyric granite. These crop out with an east to west strike between the northern and southern extremities of St Brides Bay.

In north Wales, Cambrian rocks crop out to form the Harlech Dome, and form the flanks of the Precambrian Padarn Ridge in the Bangor area. Cambrian-age sedimentary rocks are also present north of St Brides Bay in Pembrokeshire where they flank a Precambrian inlier.

The Harlech Dome comprises 4.5 km thick sequence of Cambrian age rocks divided between the older Harlech Grits Group and younger Mawddach Group. The Harlech Grits Group is dominantly coarse deltaic and turbiditic sandstone which include manganese-rich beds, whereas the Mawddach Group comprises fine-grained sandstone, siltstone and black mudstone.

The late Precambrian to Cambrian Arfon Group forms the Padarn Ridge and its flanks in the Bangor area. The Precambrian Padarn Tuff is overlain by a varied sequence of sedimentary rocks of Cambrian age including, sandstones, siltstones and mudstones, conglomerates and greywacke grits, as well as the Llanberis Slate Formation.

The Cambrian strata in Pembrokeshire comprise shallow-water sediments which are intensely faulted. There are three groups: the lowest is Caerfai Group, followed by the Solva Group and the youngest is the Menevian Group, all of which are overlain by the Lingula Flags Formation. Lithologies include mudstones, siltstones, sandstones, conglomerates and shales.

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