

Hydrogeology of Wales: Quaternary aquifers - Afon Cynffig coastal plain

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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.

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Margam Moor

Margam Moor is an area of coastal dune-land to the north-west of Afon Cynffig and situated between the Port Talbot steelworks and Porthcawl. The superficial deposits comprise blown sand over thin lacustrine alluvium above marine/estuarine alluvium on till. The blown dune sand forms a strip along the coast and a larger area towards the Afon Cynffig; the lacustrine alluvium is exposed over part of Margam Moor, much of which is floored by marine/estuarine alluvium. Direct rainfall recharge occurs to the blown sand and to an adjacent area of blown sand on which steel slag has been tipped. The sand aquifer gains from the Afon Cynffig throughout the year, as the river stage is higher than the natural water table in the sand. The lacustrine alluvium thins towards the Afon Cynffig allowing ingress of water from the blown sand directly into the marine/estuarine alluvium, although the extent to which it acts as a confining layer to the underlying marine/estuarine alluvium is questionable. The overall groundwater flow direction, however, is predominantly towards Margam Moor, with some groundwater flowing to the coast.

A conceptual flow model has been constructed from the observed groundwater levels and the construction of *potentiometric* levels both for the blown sand and for the marine/estuarine alluvium (C Stratford, personal communication). The conceptual model does not identify relative permeabilities for the blown sand, lacustrine alluvium and marine/estuarine alluvium. Steel works production slag has been dumped on the blown sand between Margam Moor and the Afon Cynffig until quite recently. Current recharge through the slag and into the blown sand is alkaline and mineralised, while the blown sand aquifer discharges to a wet area in the southern flank of Margam Moor. This feeds into a series of 'recharge' ditches which allow the polluted water to ingress into the marine/estuarine alluvium (and partly also the lacustrine alluvium) or at peak flow to discharge towards the north along the ditches. This creates a unique aquatic alkaline habitat in the ditches on the moor which are currently the object of preservation.

Kenfig National Nature Reserve

Kenfig Pool [SS 797815], to the south-east of Afon Cynffig, is essentially a large flooded dune-slack. It was the subject of detailed investigation when quarry extensions were proposed in a number of Carboniferous Limestone quarries nearby ([Cheney et al., 2000](#)).

Little evidence was found of a hydraulic connection between the dune sand that supports the Kenfig Pond and bedrock. An earlier study ([Jones, 1993](#)) showed that the dune sands are underlain by till and glaciofluvial sand and gravel. The till is absent beneath the centre of the dune area to allow a hydraulic connection with the Carboniferous Limestone below and possible upwelling, although groundwater flow modelling by [Cheney et al. \(2000\)](#) indicated that this would be unlikely, and dye tracer tests by [Jones \(1993\)](#) indicated that the Carboniferous Limestone was not a significant source to the dune aquifer. Some inflow from perched aquifers on higher ground to the east may

occur, but direct rainfall recharge to the dune sand and the underlying and adjacent raised-beach aquifer is sufficient to sustain the Kenfig Pool.

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