

# Clackmannan Group

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## Clackmannan Group ([CKN](#)), Carboniferous, Midland Valley of Scotland

The term 'Clackmannan Group' (Figure 5) was first used in the Airdrie district by I H S Hall (BGS, 1992<sup>[1]</sup>) and Forsyth et al. (1996)<sup>[2]</sup>. The succession comprises the Lower Limestone, Limestone Coal, Upper Limestone and Passage formations, which represent a variable section of *mixed shelf carbonate and deltaic ('Yoredale') facies*, *fluviodeltaic ('Millstone Grit') facies* and *fluviodeltaic ('Coal Measures') facies*. The formations are characterised by strongly cyclical, upward-coarsening units of limestone, mudstone, siltstone and sandstone capped by coal and seatearth, the proportions differing in each of the formations. Thus, beds of laterally extensive limestone, with diverse marine faunas, are more conspicuous in the Lower and Upper Limestone formations than elsewhere; coals are most common in the Limestone Coal Formation; and sandstones and seatearths (including some economically important high-alumina seatclay, fireclay and bauxitic clay) are the most prominent constituents of the [Passage Formation](#). Depositional environments, likewise, show an underlying similarity, being related to the repeated advance and retreat of fluviodeltaic systems into embayments of varying salinity. The Lower and Upper Limestone formations contain the highest proportion of marine deposits (*mixed shelf carbonate and deltaic ('Yoredale') facies*), whilst the [Passage Formation](#) is dominated by alluvial deposits (*fluviodeltaic ('Millstone Grit') facies*). The Limestone Coal Formation occupies an intermediate position (*fluviodeltaic ('Coal Measures') facies*).

The base of the group is taken at the base of the Lower Limestone Formation, where a cyclical sequence of marine limestone-bearing strata normally rests conformably on various formations of the [Strathclyde Group](#). The base of the Scottish Coal Measures Group (*fluviodeltaic ('Coal Measures') facies*) defines the top of the group.

The type area of the Clackmannan Group is the Clackmannan Syncline. It extends across the Midland Valley of Scotland and includes Machrihanish and Arran. Up to 1800 m thick in the Clackmannan area, the group is mostly Namurian in age, but ranges from Brigantian to early Langsettian.

The Clackmannan Group also occurs in the Southern Uplands of Scotland at Sanquhar and Thornhill. In the eastern part of the Sanquhar Basin the Clackmannan Group (undivided) comprises an older, highly variable sequence of mainly arenaceous and argillaceous strata, which were probably deposited in semi-isolated sub-basins during the period of maximum marine transgression. In the west of the basin, younger sandstones, siltstones and carbonaceous mudstones with marine bands probably represent marginal deltaic conditions. The base of the group is unconformable on the mainly greywacke sandstones of the Ordovician Tappins and Barrhill groups, and the top is taken at the base of Tait's Marine Band, of possible Westphalian age (Wilson in Davies, 1970, p.52<sup>[3]</sup>), at the base of the cyclical sandstones, siltstones, mudstones, seatrocks and coals of the Scottish Lower Coal Measures Formation. In the Sanquhar Basin the Clackmannan Group is about 40 m thick in total and falls within the age range of late Visean to Langsettian.

In the Thornhill Basin the Clackmannan Group (see Section 5.3) comprises the marine-intertidal Enterkin Mudstone Formation of '*mixed shelf carbonate and deltaic ('Yoredale') facies*', and the Passage Formation of '*fluviodeltaic ('Millstone Grit') facies*'. The base of the group is unconformable

on the mainly sandstone-dominated turbidites of the Ordovician Glenlee Formation, Leadhills Supergroup, and the top is taken at the conformable base of the Scottish Lower Coal Measures Formation of *fluviodeltaic* ('Coal Measures') facies. In the Thornhill Basin the Clackmannan Group is up to 55 m thick in total and falls within the age range of late Visean to pre-Westphalian.

## References

1. [↑](#) British Geological Survey. 1992. Airdrie. Scotland Sheet 31W. Solid Geology. 1:50.000. (Southampton: Ordnance Survey for British Geological Survey.)
2. [↑](#) Forsyth, I H, Hall, I H S, and McMillan, A A. 1996. Geology of the Airdrie district. *Memoir of the British Geological Survey*, Sheet 31W (Scotland)
3. [↑](#) Davies, A. 1970. Carboniferous rocks of the Sanquhar outlier. *Bulletin of the Geological Survey of Great Britain*, No. 31, 37–87.

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