

Fuel minerals, mineral resources, Northern Ireland

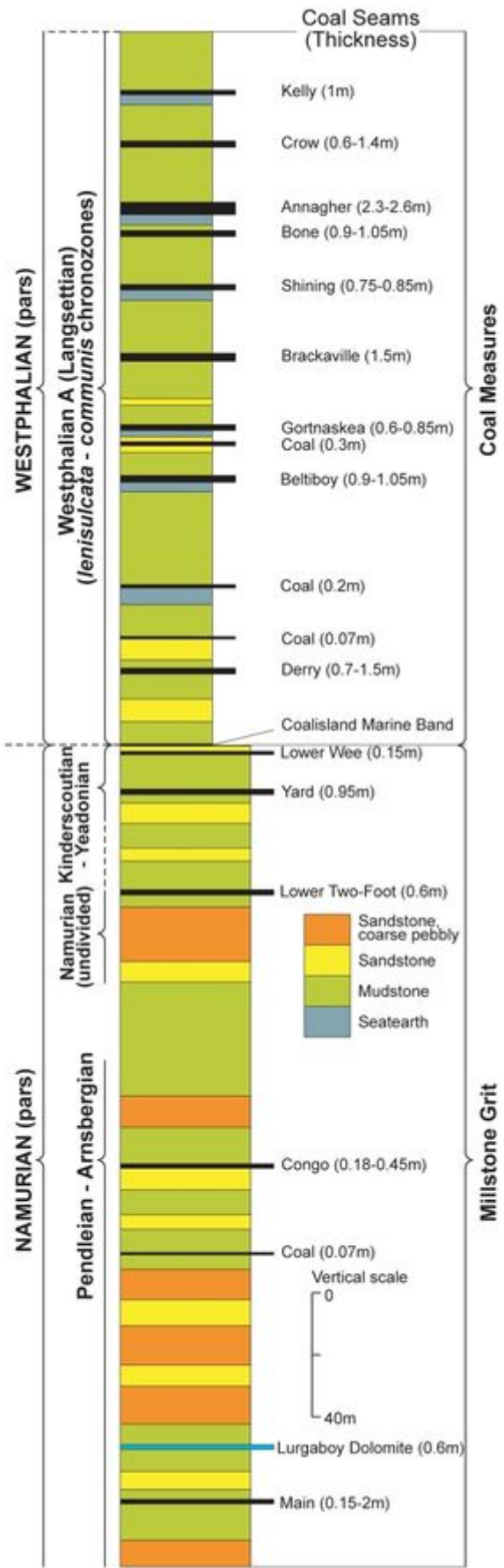
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Mitchell, W I (ed.). 2004. [The geology of Northern Ireland-our natural foundation](#). Geological Survey of Northern Ireland, Belfast.

J W Arthurs and G Earls

Coal



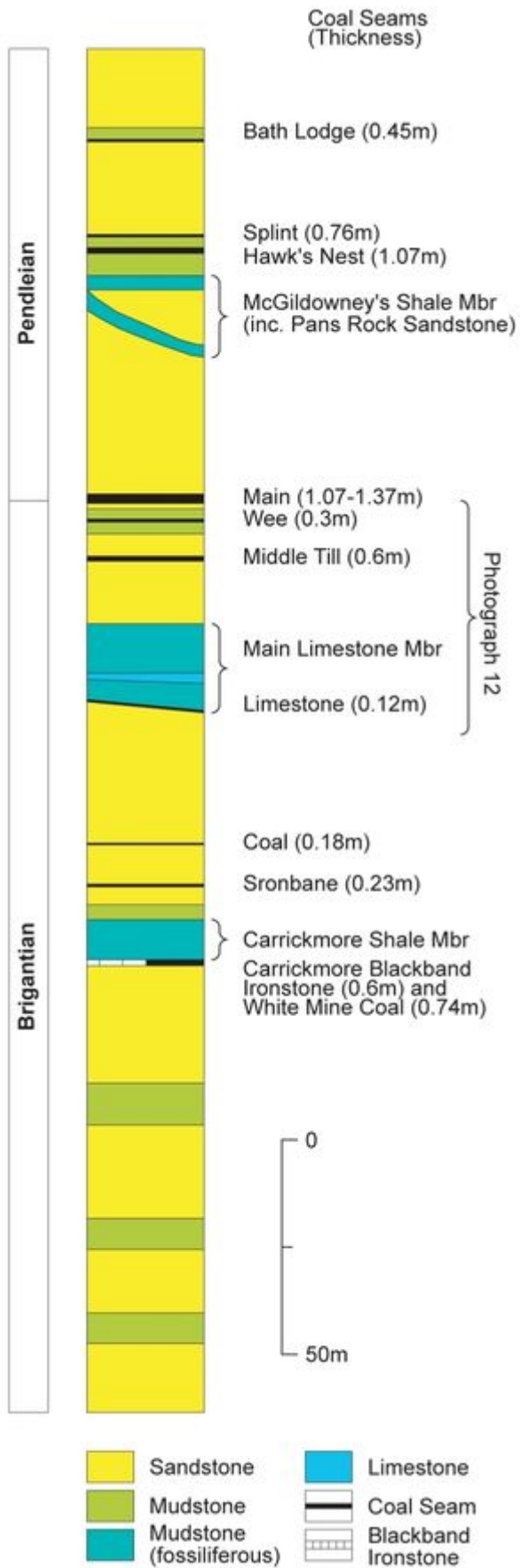
Lithostratigraphy of the Millstone Grit (Namurian) and Coal Measures (Westphalian) in east Co. Tyrone. (P947899)



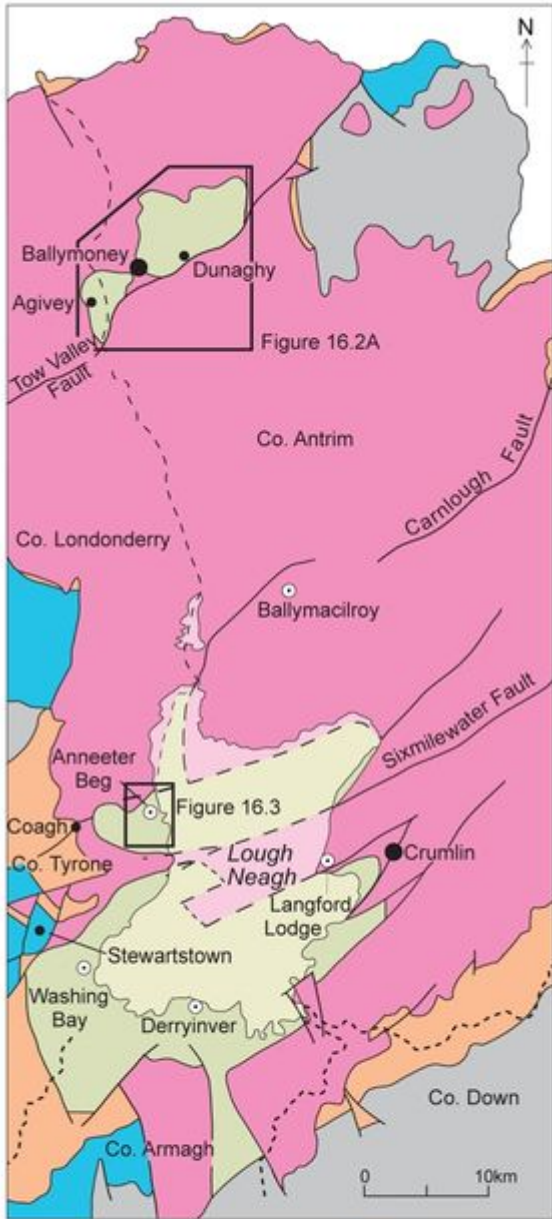
The Ballyvoy Sandstone Formation at the Gobb Colliery, 4km ENE of Ballycastle, Co. Antrim. (P948060)

Formation	Lithology	Age
Ballyvoy Sandstone (c. 350m)	Sandstone, purple or brown, weathering red, pink, greyish white, fine- to coarse-grained, pebbly, planar and trough cross-bedding, pebble lags, channel bedforms. Mudstone, purple, rarely grey with hematite and limonite nodules; blackband ironstone. Main Limestone Member , fossiliferous mudstone and thin limestone. Coal seams of variable quality, seat earth and mudstone. Carrickmore and McGildowney's Shale members consist of fossiliferous dark grey mudstone, sandy with thin limestone	Pendleian
Murlough Shale (46m)	Mudstone, dark grey, plant debris, ostracods, fish and coprolites, ironstone and phosphatic nodules; 10 coal seams up to 1.3m thick	Brigantian
Glenshesk Tuff (61m)	Mudstone, reddish brown to grey, dolomitic; greenish grey vitric and lithic tuffs; tuffaceous sandstone; fireclay; plant fossils	
Carey River Basalt (c. 40m)	Lava flows, subaerial, micro-porphyrific olivine basalt, spheroidal weathering, crudely columnar	
Eglish Sandstone (c. 215m)	Conglomerate, reddish brown, yellow-stained; sandstone, grey, white and yellow, coaly streaks; grey mudstone with miospores	

Lithostratigraphy of the Ballycastle Group at Ballycastle. (P947928)



Lithostratigraphy of the Ballyvoy Sandstone Formation at Ballycastle. (P947900)



Simplified geological map illustrating the distribution of the Lough Neagh Group. (P947874)



Aerial view of part of the Crumlin lignite deposit, Co. Antrim. (P948061)

Hard Coal occurs in two small coalfields that are exposed at surface in Northern Ireland. These are the Coalisland coalfield in Co. Tyrone (Namurian to Westphalian) and the Ballycastle coalfield (Viséan to Namurian) in Co. Antrim ([see Carboniferous article](#)). Coal production in Northern Ireland was significant in the 18th and 19th centuries but now has little economic potential as a source of hard coal. However, it is of interest as a source bed for hydrocarbon generation.

The Coalisland coalfield, lying between Coalisland and Dungannon, is a triangular-shaped, fault-bounded block unconformably overlain by Triassic sedimentary rocks ^[1]. There are two groups of coal seams. In the southwest part of the coalfield the Namurian Millstone Grit succession includes the Main Coal near the base of the succession with a series of thinner, workable, coals above ([P947899](#)). The Main Coal was discovered in 1672 and worked until 1709. The succession in the northeast part of the coalfield comprises the Westphalian Coal Measures with eight seams of workable thickness. The thickest of these, the Annagher Coal, was worked in the 1840s. Records of proximate analyses give ranges of 47.48–51.55% fixed carbon, 37.19–48.0% volatiles, 4.57–11.28% ash and 1.65–2.8% sulphur for the Main Coal. The coal rank is therefore high volatile bituminous (B-C) coal with relatively high sulphur. Steep dips of up to 50° hindered production throughout the operating life of the mines and mining ceased in the 1930s. Drilling in 1958 indicated 250 000 tons remaining in the Derry Coal seam.

The Carboniferous rocks of the Ballycastle coalfield ^[2] are exposed in sea cliffs east of Ballycastle ([P948060](#)). While there is archaeological evidence that some coal could have been used in the 13th Century, the main period of development began in 1733 with maximum output of about 15 000 tons per annum. Production declined in the early 19th Century and continued intermittently thereafter, although it was not until 1967 that the last mine was finally abandoned. In the lower part of the succession the Murlough Shale Formation contains ten coal seams (Ballyvoy coals) up to 1.3 m thick which are documented in boreholes ([P947928](#)). The highest unit in the coalfield, the Ballyvoy Sandstone Formation, contains the most accessible coal seams including the Main Coal and the Hawk's Nest Coal, which provided most of the output ([P947900](#)).

Proximate analyses for the Main Coal report fixed carbon 48.7–57.01%, volatiles 27.93–36.2%, ash 4.9–9.04% and sulphur 0.7–1.02%, with calorific values in the range 11 640–12 411 Btu. It is therefore ranked between Sub-bituminous A and High Volatile Bituminous B Coal, with lower sulphur and ash contents than the Main Coal in Co. Tyrone.

Carboniferous coal is known and suspected to be present at depth elsewhere in Northern Ireland. The Rathlin Basin extends to the north offshore from Counties Antrim and Londonderry. Coal was encountered at 1142 m below surface in the Magilligan borehole [C 683 353] in Co. Londonderry. Coal is also likely to be present at depth in other sedimentary basins beneath the Antrim Plateau.

Lignite

Lignite or brown coal was first noted in the Oligocene Lough Neagh Group ([see Late Palaeogene \(Oligocene\) sedimentary basins article](#)) around Lough Neagh in 1757. ^[1] However, neither the regional distribution of the Oligocene basins nor the quantity of lignite present was appreciated until the 1980s when large deposits were discovered ^[3]. Since then detailed exploration at Crumlin and Ballymoney has revealed a lignite resource of about 1 billion tonnes, with the largest deposit located at Ballymoney. The deposits are potentially mineable although the only currently known use is for power generation.

Deposits of lignite have been found in four areas ([P947874](#)). Near Crumlin, Co. Antrim, two thick seam groups sub-outcrop beneath superficial deposits close to the east shore of Lough Neagh and extend southwest beneath the Lough ([P948061](#)). Another group of lignite seams is known between Coagh and the west shore of Lough Neagh in Co. Tyrone, and also between Stewartstown and the southwest shore of the Lough. The largest deposits were found in north Co. Antrim 40 km to the north of Lough Neagh, close to Ballymoney.

The lignite beds are flat-lying or shallow dipping within small fault-bounded basins of the Lough Neagh Group. The lignite contains up to 75% carbon and there are two varieties. The woody form contains silicified plant fragments and the non-woody variety is massive and blocky. The beds range from very thin to tens of metres thick and are contained in a succession of sandy clays and silts ^[4]. The coal rank is Lignite B and proximate analyses are given in Table 21.1.

Peat

Peat has been hand-dug as a fuel in Ireland from pre-historic times to the present day. Peat bogs in Northern Ireland, being generally smaller, were never developed on an industrial scale for power generation as they were in the Irish Midlands.

Uranium

Uranium exploration in the late 1970s, driven by escalation in the oil price, identified secondary mineralisation associated with the Mourne Mountains granites and the Newry Igneous Complex. These minerals were deposited on joint faces in the granites by late stage hydrothermal fluids circulating after the granite had solidified.

References

1. ^[1] ^[2] Fowler, A, and Robbie, J A. 1961. *Geology of the country around Dungannon*. Memoir of the Geological Survey of Northern Ireland, Sheet 35 (Northern Ireland).
2. ^[3] Wilson, H E, and Robbie, J A. 1966. *Geology of the country around Ballycastle*. Memoir of the Geological Survey of Northern Ireland, Sheet 8 (Northern Ireland).
3. ^[4] Griffith, A E, Legg, I C, and Mitchell, W I. 1987. Mineral Resources. In: Buchanan, R H, and Walker, B M. (eds.). *Province, City and People: Belfast and its Region*. 43-58. Greystone Books, Belfast.
4. ^[5] Legg, I C. 1992. *Tertiary Lignite Deposits of Northern Ireland*. In: Bowden, A A, Earls, G, O'Connor, P G, and Pyne, J F. (eds.). *The Irish Minerals Industry 1980-1990. Irish Association for Economic Geology*. Dublin, 359-68.

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