

Mineral Resources Data Sheet – Northern Ireland

Although minerals underpin our economy, their extraction can impact on the environment. The new Mineral Resources Map of Northern Ireland provides planners, industry and the wider community with a powerful tool to assist in decision-making related to mineral supply and protection of the environment.

A key aspect of sustainable development is the conservation and safeguarding of non-renewable resources, such as minerals. There is a need to ensure that these resources are not needlessly sterilised by other development thus reducing access to supplies for future generations. Following a commission from the Department of the Environment, the Department of Enterprise Trade and Investment based Geological Survey of Northern Ireland worked with its counterpart, the British Geological Survey, to produce a Mineral Resources Map of Northern Ireland. The map is intended to assist strategic decision-making in respect of mineral extraction and the protection of important mineral resources against sterilisation. The mineral resources map allows all stakeholders to visualise the distribution of mineral resources and to relate them to other forms of land-use (such as urban areas or nature conservation areas) or to other factors (such as transport infrastructure). The map has been produced by the collation and interpretation of mineral resource data principally held by the Geological Survey of Northern Ireland. As such it brings together a wide range of information, much of which was not always available in a convenient form.

The Mineral Resources Map of Northern Ireland is presented on six county maps at the 1:100 000 scale:

- County Antrim and Belfast. Lusty, P. A. J., Mankelow, J. M., Cooper, M. R., Cameron, D. G., Pitfield, P. E. J., Shaw, R. A., and Linley, K. A. OR/12/017.
- County Armagh. Pitfield, P. E. J., Mankelow, J. M., Cooper, M. R., Cameron, D. G., Lusty, P. A. J., Shaw, R. A., and Linley, K. A. OR/12/019
- County Down and Belfast. Pitfield, P. E. J., Mankelow, J. M., Cooper, M. R., Cameron, D. G., Lusty, P. A. J., Shaw, R. A., and Linley, K. A. OR/12/018
- County Fermanagh. Shaw, R. A., Mankelow, J. M., Cooper, M. R., Cameron, D. G., Lusty, P. A. J., Pitfield, P. E. J., and Linley, K. A. OR/12/015
- County Londonderry. Pitfield, P. E. J., Mankelow, J. M., Cooper, M. R., Shaw, R. A., Lusty, P. A. J., Cameron, D. G., and Linley, K. A. OR/12/016
- County Tyrone. Shaw, R. A., Pitfield, P. E. J., Mankelow, J. M., Cooper, M. R., Lusty, P. A. J., Cameron, D. G. and Linley, K. A. OR/12/014

The maps can be downloaded from <http://www.bgs.ac.uk/mineralsuk/planning/resource.html#ni>. The mineral resource dataset depicted on these maps is also available in a digital format for use under licence within a Geographical Information System (GIS). Data have been created as vector polygons and are supplied as ArcGIS (.shp) files.

Mineral resource information

Northern Ireland is endowed with a wide range of indigenous mineral resources. However, these resources are finite and they can only be worked where they occur. These indigenous minerals play a fundamental role in underpinning the growth of many sectors of the economy and in contributing to the UK's high standard of living. It is, therefore, important to know where these minerals occur in order to help ensure an adequate and steady supply into the future.

Mineral resources are natural concentrations of minerals which might now, or in the foreseeable future, be of economic value. The identification and delineation of mineral resources is imprecise as it is limited by the quantity and quality of data currently available and involves predicting what might or might not become economic to work in the future. The assessment of mineral resources is, therefore, a dynamic process which must take into account a range of factors. These include geological reinterpretation as additional data becomes available, as well as the continually evolving demand for minerals, or specific qualities of minerals, due to changing economic, technical and environmental factors. Consequently, the economic potential of mineral resources is not static, but changes with time.

Generally, a mineral resource is known to exist within the boundaries outlined by geological mapping, which may be supplemented by more in depth geological data. Data depicted on the Mineral Resources of Northern Ireland map show the inferred extent of a mineral resource.

What is a mineral resource?

Mineral resources are natural accumulations of minerals, of bodies or rock that are (or may become) of potential economic interest as a basis for the extraction of a commodity.

Inferred resources are those defined from available geological information and assumed but not verified geological continuity. They have neither been evaluated by drilling or other sampling methods, nor had their technical properties characterised, on any systematic basis.

When does a mineral resource become a mineral reserve?

A **mineral reserve** is that part of a mineral resource that is economic to work and has been fully evaluated on a systematic basis by drilling and sampling and is free from any legal or other obstruction that might inhibit extraction.

More detailed evaluations of a mineral resource (such as trenching and drilling) may result in the identification of an area where the volume and quality of mineral are such that they could be economically extracted. Once planning permission for extraction has been received it can be called a mineral reserve.

The Mineral Resource Map of Northern Ireland does not delineate mineral reserves. Therefore, there is no presumption that any areas delineated within the dataset will ultimately be acceptable for mineral extraction.

The purpose of these data is to show a broad distribution of those mineral resources which may be of current or future economic interest. They are intended to assist in the consideration and preparation of planning documents in respect of mineral extraction and the protection of important mineral resources against sterilisation. **The data are intended for general consideration of mineral issues and not as a source of detailed information on specific sites.**

The mineral resources present in Northern Ireland have been evaluated in the context of the age of the geological unit, its mode and environment of formation and changes due to subsequent geological processes. The Mineral Resources Map of Northern Ireland can be divided into those resources which are obtained from unconsolidated superficial deposits (formerly termed 'drift') such as sand and gravel and those derived from a solid bedrock source such as sandstone and limestone. Much of Northern Ireland is covered by thick superficial deposits of glacial till. This overburden would need to be removed prior to the working of many of the bedrock resources. The potential depth at which overburden can be removed in order to extract the mineral resource is dependent on economic and technical factors and will differ between resources and their location. Further information on each of the individual resource types present is included on the map.

The mineral resources data layers

The Mineral Resource data layers cover the whole of Northern Ireland and they directly reflect the information shown on the published maps. They have been produced using the 1:50 000 scale digital geological map data where it is available. There are, however, small areas of counties Tyrone, Down and Armagh which do not have 1:50 000 scale mapping available. These areas have been produced using the 1:250 000 scale geological map data. A map indicating the scale and data coverage is shown in Figure 1.

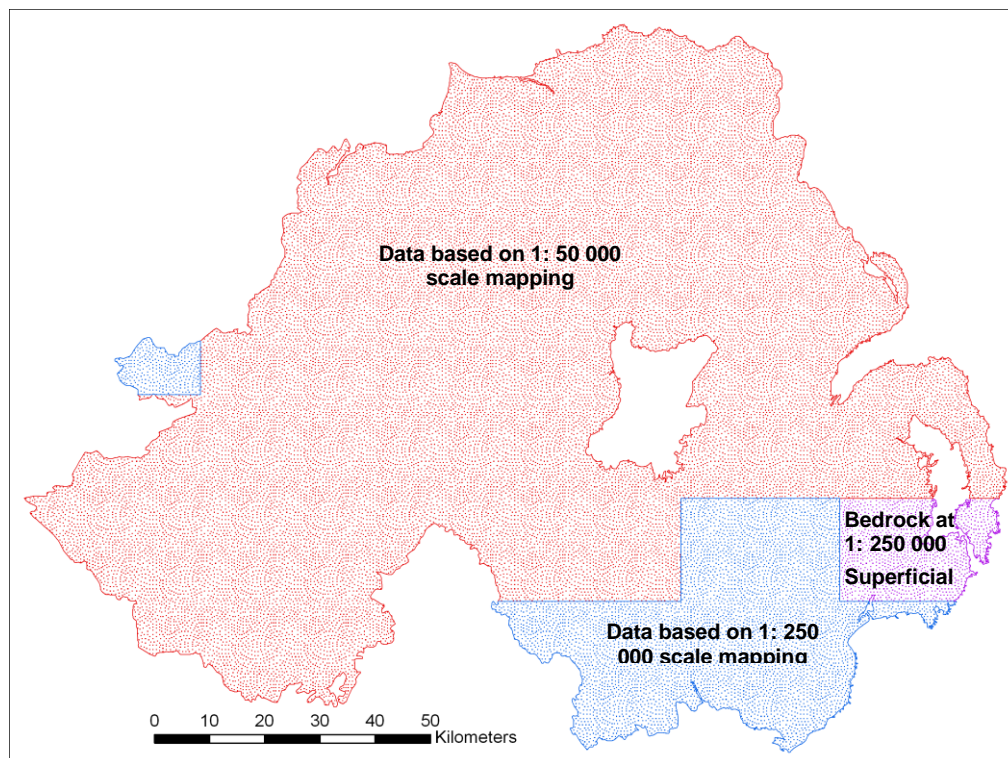


Figure 1: Areas mapped at 1:50 000 and 1:250 000 scales

Each individual mineral resource polygon is attributed with the name of the resource (Table 1).

Table 1: Mineral resource attribute field descriptions

Field Name	Field Type (number of characters)	Description
RESOURCE	String (100)	Mineral resource category assigned to individual polygon

Table 2 contains a complete list of the mineral resource data including their scale and a description of the mineral resource categories identified in each data layer.

Table 2: Mineral resource data layers

Resource		Scale
Clay		
File name	Clay_50k_Dissolve_v1	1:50 000
Resource Description	The clay mineral resource layer occurs only in the 1: 50 000 scale data and is divided into three resource categories: Brick clay Fireclay (coincident with coal-bearing strata) fireclay – The extent of clays matches the extent of the Shallow coal (coincident with fireclay) contained in the coal and lignite layer. Lough Neagh clay (coincident with shallow coal) – The mineral resource extent for this category matches the extent of the Lignite (coincident with the Lough Neagh clay) contained in the coal and lignite layer.	
Coverage	Data for this layer occurs in counties Antrim, Armagh, Down, Londonderry and Tyrone.	
Coal and Lignite		
File name	Coal_and_Lignite_50k_Dissolve_v1	1:50 000
Resource Description	The coal and lignite resource layer occurs only in the 1: 50 000 scale data and is divided into two resource categories: Lignite (coincident with Lough Neagh clay) – The mineral resource extent shown here matches the extent of the Lough Neagh clay category in the clay layer. Shallow Coal (coincident with fireclay) – The extent of these shallow coals matches the extent of the fireclay resources in the fireclay layer.	
Coverage	Data for these layers occurs in counties Antrim, Londonderry and Tyrone.	

Lignite - subsurface extent		
File name	Lignite_Subsurface_Extent_50k_v1	1:50 000
Resource Description	Lignite subsurface extent indicates the subsurface extent of lignite at Ballymoney. The lignite area was obtained from: IMC. 2003. Report on the extent of sub-cropping lignite at Ballymoney, County Antrim, Northern Ireland. IMC Consulting Ltd. Lowman, R.D.W. 2003. Crumlin Lignite Policy Area. Wardell Armstrong.	
Coverage	Data for this layer occurs only in County Antrim.	
Conglomerate		
File name	Conglomerate_50k_Dissolved_v1	1:50 000
Resource Description	The conglomerate resource layer occurs only in the 1: 50 000 scale data and contains a single resource category: Conglomerate	
Coverage	Data for this layer occurs in all counties: Armagh Fermanagh, Down and Tyrone.	
Dolomite		
File name	Dolomite_50k_Dissolve_v1	1:50 000
Resource Description	The dolomite resource layer occurs only in the 1: 50 000 scale data and contains a single resource category: Dolomite	
Coverage	Data for this layer occurs in counties Armagh, Fermanagh, and Tyrone.	
Igneous and Meta-igneous		
File name	Igneous_and_Metaigneous_rock_50k_Dissolve_v1 Igneous_and_Metaigneous_rock_250k_Areas_Not_Covered_By_50k_Only_Dissolve_v1	1:50 000 1:250 000
Resource Description	Data for the igneous and meta-igneous resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same mineral resource categories: Dolerite, lamprophyres, and their metamorphic equivalents (meta-dolerites and meta-gabbros) suitable for high specification aggregate Other igneous and meta-igneous rocks (basalts, andesites, rhyolites, granites, volcanogenic and meta-volcanic rocks)	

Coverage	Data for this layer occurs in all counties.	
Limestone		
File name	Limestone_50k_Dissolve_v1 Limestone_250k_Areas_Not_Covered_By_50k_Only_v1	1:50 000 1:250 000
Resource Description	Data for the limestone resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same mineral resource categories: High purity limestone (>97% CaCO₃) – Ulster White Limestone Limestone - Carboniferous Other Limestone	
Coverage	Data for the limestone layer occurs in all counties.	
Limestone Buffers		
File name	Limestone_50k_Buffer_100m_v1	1:50 000
Resource Description	This layer provides a buffer to the east of the Ulster White Limestone Formation. The buffer has been provided to indicate the continuation of the shallow dipping Ulster White limestone under the surrounding rocks. This has been created to signify the direction and continued extent of this high purity and scarce mineral resource. The layer also contains a 100m buffer on the dolomite outcrop west of Armagh to indicate its extension under the surrounding rocks westwards. This has been done to signify the direction and continued shallow extent of this mineral resource.	
Coverage	The buffered layer occurs in counties Armagh, Londonderry and Tyrone.	
Meta-Sedimentary		
File name	MetaSedimentary_50k_Dissolve_v1 MetaSedimentary_250k_Areas_Not_Covered_By_50k_Only_Dissolve_v1	1:50 000 1:250 000
Resource Description	Data for the meta-sedimentary resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same mineral resource categories: Psammites (category found only in Fermanagh) Psammites and Quartzites Slate	
Coverage	Data for this layer occurs in all counties: Antrim, Down, Fermanagh, Londonderry and Tyrone.	

Peat		
File name	Peat_50k_Dissolve_v1 Peat_250k_Areas_Not_Covered_By_50k_Only_Dissolved_v1	1:50 000 1:50 000
Resource Description	Data for the peat resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same single mineral resource categories: Peat	
Coverage	Data for this layer occurs in all counties.	
Perlite		
File name	Perlite_50k_Dissolve_v1	1:50 000
Description	The perlite mineral resource layer occurs only in the 1: 50 000 scale data and contains a single resource category: Perlite	
Coverage	Data for this layer occurs in County Antrim.	
Salt – subsurface extent		
File name	Salt_50k_Dissolve_v1	1:50 000
Resource Description	The salt mineral resource layer occurs only in the 1: 50 000 scale data and contains one resource category: Subsurface extent of salt The salt data are solely not based on mapped geological features but has been derived from the interpretation of structural data, existing licence areas, and mapped salt bearing rocks. The principal source of information was the following report: Evans, D.J., Reay, D.M., Riley, N.J., Mitchell, W.I. and Busby. 2006. Appraisal of underground energy storage potential in Northern Ireland. British Geological Survey Internal Report IR/06/095.	
Coverage	Data for this layer occurs only in County Antrim.	
Sand and Gravel		
File name	Sand_and_Gravel_50k_Dissolve_v1 Sand_and_gravel_250k_Areas_Not_Covered_By_50k_Only_Dissolve_v1	1:50 000 1:250 000
Resource Description	Data for the sand and gravel resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same mineral resource classes: Raised beach sand	

	Blown sand Glaciofluvial and glacial deposits	
Coverage	Data for this layer occurs in all counties.	
Sandstone		
File name	Sandstone_50k_Dissolve_v1 Sandstone_250k_Areas_Not_covered_By_50k_Only_Dissolve_v1	1:50 000 1:250 000
Resource Description	Data for the sandstone resource forms two layers with areas at both 1: 50 000 and 1: 250 000 scales. Both data layers contain the same mineral resource classes: Sandstone with potential for high specification aggregate Other sandstone Note - Code for Hawick sandstone (HWK-SDST) is defined as 'Other sandstone' resource. However, in county Down (example grid reference 329067, 318900) an area of metamorphic aureole surrounds an igneous intrusion, which has 'baked' the sandstone transforming it to a 'sandstone with potential for high specification aggregate' resource.	
Coverage	Data for this layer occurs in all counties.	
Silica Sand		
File name	Silica_Sand_50k_Dissolve_v1	1:50 000
Resource Description	The silica sand mineral resource layer occurs only in the 1: 50 000 scale data and contains a single resource category: Silica sand	
Coverage	Data for this layer occurs only in counties Antrim and Tyrone.	

Data format

The Mineral Resource data has been created as vector polygons using ArcGIS (9.3.1) and is held as attributed as ESRI shapefiles. Other GIS formats can be created e.g. MapInfo TAB but may incur an added cost. The mineral resource data layers are accompanied by a set of ArcGIS 9.3.1 layer files (lyr) these contain the colour which match the paper maps. Details of the colours used are given in Table 3.

Table 3: Legend colours for mineral resource data

Layer	Resource	Colour (Red, Blue, Green)	
Clay	Lough Neagh Clay (coincident with fireclay)	205,137,102	
	Brick Clay	245,162,122	
	Fireclay (coincident with shallow coal)	178,178,178	
Coal and lignite	Lignite (coincident with Lough Neagh clay)	205,137,102	
	Shallow coal (coincident with fireclay)	178,178,178	
Subsurface extent of lignite	Subsurface extent of lignite (Ballymoney lignite field only)	137,90,68	
Conglomerate	Conglomerate	215,184,158	
Dolomite	Dolomite	166,255,255	
Igneous and meta- igneous	Dolerites, lamprophyres and their metamorphic equivalents (meta-dolerites and meta-gabbros suitable for high specification aggregates.	202,54,214	
	Other igneous and meta-igneous rocks (basalts, andesites, rhyolites, granites, volcanogenic and meta-volcanic rocks)	249,82,66	
Limestone	High purity limestone (97%CaCO ₃)	115,178,255	
	Limestone - carboniferous	115,222,255	
	Other limestone	190,232,255	
Limestone buffers	Ulster white Limestone 100m buffer (east of outcrop)	0,77,168	
	Dolomite 100m buffer (west of Armagh)	0,77,168	
Meta-Sedimentary	Psammities	178,178,255	
	Psammities and quartzites	178,178,255	
	Slate	122,142,245	
Peat	Peat	204,170,102	
Perlite	Perlite	205,102,102	
Salt	Subsurface extent of salt bearing strata	0,115,76	
Sand and Gravel	Raised beach deposits	0,115,76 255,246,51	
	Blown Sand	255,85,0	
	Glaciofluvial and glacial deposits	255,115,223	
Sandstone	Sandstone with potential for high specification aggregate	122,237,83	
	Other sandstone	205,245,122	
Silica Sand	Silica sand	255,170,0	

Data projection

All data created and included here is in Irish National grid, details of which are given below.

TM65_Irish_Grid

Projection: Transverse_Mercator

False_Easting: 200000.000000

False_Northing: 250000.000000

Central_Meridian: -8.000000

Scale_Factor: 1.000035

Latitude_Of_Origin: 53.500000

Linear Unit: Meter (1.000000)

Geographic Coordinate System: GCS_TM65

Angular Unit: Degree (0.017453292519943299)

Prime Meridian: Greenwich (0.000000000000000000)

Datum: D_TM65

Spheroid: Airy_Modified

Semimajor Axis: 6377340.189000000200000000

Semiminor Axis: 6356034.447938534400000000

Inverse Flattening: 299.324964599999990000

Data limitations

- a) The mineral resource data layers are based on the best available information, but are not comprehensive and their quality is variable. The inferred boundaries shown are approximate.
- b) The mineral resources defined delineate the areas within which potentially workable minerals may occur. These areas are not of uniform potential and also take no account of planning constraints that may limit their working.
- c) Much of Northern Ireland is covered by thick superficial deposits of peat and glacial till; this overburden would need to be removed prior to the working of many of the bedrock resources.
- d) Glacial till is not considered to be a resource although it may contain small sand and gravel deposits and is not included in the mineral resource data.
- e) Many palaeogene dykes (igneous and meta-igneous) are not shown on the maps on the assumption that they are too narrow and/or altered to constitute an aggregate resource. The only exceptions to this are where the host rocks are of similar composition and are/or could be exploited for aggregate use. Where such thin dykes have been removed from the data the resulting long, linear and thin gaps have been infilled to improve the visual appearance of the maps.
- f) The economic potential of specific sites can only be proved by a detailed evaluation programme. Such an investigation is an essential precursor to submitting a planning application for mineral working.
- g) Some isolated mineral workings may occur outside the areas identified as having mineral resource potential. The presence of these operations generally reflects very local or specific situations.
- h) The mineral resource data is intended for general consideration of mineral issues and not as a source of detailed information on specific sites.
- i) The mineral resource data should not be used to determine individual planning applications or in taking other decisions on the acquisition or use of a particular piece of land, although they may give useful background information which sets a specific proposal within context.

- j) The mineral resource data has been developed using 1:50 000 and 1:250 000 scale data and should not be used at larger scales.

Further information

Further information on this or other digital data sets provided by the Geological Survey of Northern Ireland can be obtained from:

Geological Survey of Northern Ireland

Dundonald House

Upper Newtownards Road

BT4 3SB

Tel: +44 (0)28 9038 8462

email: gsni@economy-ni.gov.uk