

DEPARTMENT FOR THE ECONOMY RESPONSE; NEWRY MOURNE & DOWN DISTRICT COUNCIL LOCAL DEVELOPMENT PLAN

Geological Survey NI / Minerals: MAPB/GSNI colleagues would welcome an opportunity to meet with the Council to discuss any issues / assistance. The Departmental contacts are Lorraine Fleming Lorraine.Fleming@economy-ni.gov.uk or Yvonne Curran Yvonne.curran@economy-ni.gov.uk.

Geology: Newry, Mourne and Down District Council area has a diverse geology relative to other council areas in Northern Ireland which lends itself to a wide range of potential natural resources. The early Palaeozoic marine sediments of the Longford-Down terrane dominate the area, providing an extensive sandstone resource which is exploited by a number of quarry operators across Counties Down and Armagh. These sediments are intruded by the late Palaeozoic igneous rocks of the Newry Igneous Complex and the younger Palaeogene granites of the Mourne Mountains. Extensive Palaeogene dyke swarms (narrow near-vertical sheets of hard basalt type rocks), are also found across the DC area. The bedrock is covered by variable thicknesses of glacial deposits the most common of which is glacial till (a mixture of stiff clay containing rock fragments of varying sizes). Sand and gravel deposits are restricted to the southern and eastern sides of the Mournes in County Down and peat is found as discrete pockets associated with the drumlin fields found in County Down, to the north and east of the igneous intrusions.

The text below gives a brief overview of the natural mineral, energy and water resources that may be available to meet the future needs of the people of the Newry, Mourne and Down Council area and across Northern Ireland. The [Minerals Information Paper](#) on the DfE website gives additional information about the resource potential and the methods involved in minerals exploration are described in the online document [Mineral prospecting – common exploration methods](#).

In considering planning options it is important to consider each type of Mineral, its potential and the methods for exploration and extraction.

Aggregates: The most recent information on aggregates which the GSNI holds relates to the unpublished 2011 annual mineral return. A total of 21 quarries employing 189 staff, submitted information for the year, though an additional 6 quarry locations are known for the area. The value of the aggregates extracted in 2011 was reported at £4.7million, with 85% of that figure accounted for by the relatively high value greywacke (sandstone) of the Longford-Down terrane. The remainder of the value is split between the sand and gravel deposits and igneous rock, with a limited amount of mudstone. The 2011 figures reflect the low level of construction activity at that time, following the economic downturn, and demand for aggregates is likely to increase as construction and infrastructure development returns to more usual levels.

Aggregate extraction is likely to remain a major industry in the Council area. Materials for infrastructure development will be required for the council area and the continuing availability of local supplies of aggregates would reduce the costs of transport and the associated environmental impacts of longer distance HGV journeys. There may also be the potential and need to supply further afield within Northern Ireland and, in the case of the high value, high specification greywacke aggregates, for the European

export market. These local and wider economic benefits should be considered when deciding the Preferred Options for minerals.

The minerals planning maps produced by the British Geological Survey indicate the extent of the potential resources across the District Council area. Recent work has been carried out by the GSNI to further refine the availability of these resources by taking into account those areas which cannot be exploited. Surface infrastructure development (roads and housing) and surface water features (rivers and lakes) were the two groups analysed and removed from the areas of potential resources. In considering the content of the Preferred Options Paper, and in particular the safeguarding requirements for and the sustainable development of minerals resources, the Council should be aware of the impact that surface sterilization can have. As an example, availability of the key greywacke sandstone resource (which contributes 85% of the quarry return by value) is reduced by a minimum of 52% through this exercise. Similar reductions are recorded for all the mapped resources in the council area. This information should be used to inform the designation of areas for mineral reserves and areas of constraint on mineral development.

Building Stones: The local rocks are relatively little used for dimension (building) stone although historically the Mourne granites and the Newry granodiorite have been quarried for this purpose, most notably for use in churches and monuments. The Council should consider identifying suitable sources of rock to meet restoration and specialised building needs in the future. The greywackes do not readily lend themselves to the production of building stones and historically were used mostly as construction material in buildings with an exterior surface applied as facing. More recently, machine-cut blocks of greywacke have been used as exterior features in some houses in the district and there may be potential to expand this use. Boulders of Mourne granite and Newry granodiorite have been used in the construction of the dry stone walls which are a distinctive feature of the landscape in and around the Mourne. Consideration should be given to where these boulders can be sourced to meet future demand.

High Value Minerals: The area covered by the District Council has a history of metallic mineral mining dating back to the 1800's with reports of copper, lead and iron being targeted by small scale operations and, in the more distant past, the making of gold jewellery from local sources. More recently mineral prospecting licences have been issued by the Department to Dublin-based junior exploration company Conroy Gold and Natural Resources. Conroy has been actively prospecting an area from Newtownhamilton south to the border since the mid 1990's, targeting base and precious metals. A variety of low impact prospecting techniques have been employed to refine potential targets, though to date no economic deposit has been identified. The area remains to be fully evaluated for its mineral potential and Conroy has been supported in their efforts by the Department through the assessment and award of Mineral Prospecting Licences. Although no other companies are actively interested in metallic mineral prospecting in the council area, additional mineral evaluation is being carried out through academic studies. It is important that the Council's planning policies understand the difference between the low impact mineral exploration process and mineral development/extraction process. GSNI is available for consultation on any matter that relates to metallic mineral exploration to assist the Council as it formulates its policies.

Energy Minerals: Energy minerals, such as coal and lignite, are not present within the Council area. Small deposits of peat are scattered throughout the DC area and have historically been dug under turbary rights but these are not significant when compared to other areas of Northern Ireland. There is no potential for oil and gas resources within the Council area.

Energy: DfE would draw the Council's attention to the contribution that shallow geothermal energy could make to a sustainable energy policy in the LDP. Geothermal energy, from both shallow and deep sources, can play a role in meeting part of the heat energy demand in Northern Ireland. Geothermal energy is a reliable low carbon, sustainable energy resource which can play a role in the decarbonisation of the heat sector, particularly where linked to renewable electricity supplies. Unlike other renewable energy resources such as wind, tidal or solar it is not subject to short term fluctuations – it is available 24/7 and 365 days a year. The other important property of shallow geothermal heat systems is that their heat output is 3 to 4 times the electricity input that the heat pumps use. The main thrust of government energy policy has been on the decarbonisation of electricity and ground source heat pump (GSHP) systems can use electricity generated from renewable sources to meet heat demand whilst only producing very small carbon emissions. GSHP technology uses the ground's heat energy to provide heating for domestic and non-domestic buildings via horizontal closed loop systems buried at depths of 1 – 2 metres or vertical systems installed in boreholes up to 100 metres deep. Most areas within the Newry, Mourne and Down Council area would be suitable for the deployment of closed loop GSHP systems. The glacial outwash sands and gravels of the Mourne Plain near Kilkeel may be suitable for the deployment of open loop systems that abstract the heat energy directly from the shallow groundwater aquifer using dual abstraction and injection boreholes.

There may be potential for pumped energy storage within the Council area – this was first suggested in the 1970's and the strategic importance of energy storage in helping to meet fluctuating energy demand from variable renewable energy sources has been recognised in recent years. The Council may wish to consider this possibility in the development of their POP and LDP.

Tourism - UNESCO Global Geopark: The Council, through its Tourism Strategy 2017-2021, has identified the establishment of a UNESCO Global Geopark as one of their catalyst projects during this period. Whilst the boundary for this has not yet been decided, it is likely to take in the areas of the Mourne AONB and the Ring of Gullion AONB, with potential for the addition of the Strangford & Lecale AONB (that also takes in part of the Ards & North Down District Council area).

UNESCO Global Geoparks are established under the International Geoscience and Geoparks Programme (IGGP) of UNESCO and are areas of international geological significance that are holistically managed for sustainable tourism, education and conservation. As stated in the IGGP Operational Guidelines for UNESCO Global Geoparks, they must respect local and national laws relating to the protection of geological heritage (such as ASSIs and SACs), but it should be made clear that the UNESCO Global Geopark designation should not place a restriction on economic development.

Land Stability (Intro): Northern Ireland is generally composed of stable ground with some areas deemed to have variable degrees of land instability that are for example related to landslides, abandoned mines and compressible ground. Within areas of instability, subsidence and surface movement events have occurred in the past and could take place in the future.

The majority of landslide events occur naturally but can be triggered by human activity, particularly new development in susceptible areas. The most common forms of landslide in Northern Ireland are mudflows, peat bog bursts, rock falls and debris flows. Northern Ireland has a rich history of mining activity which has left the legacy of over 2,400 mine shafts, adits and abandoned workings. These are predominately located in County Antrim and east County Tyrone with smaller concentrations in other locations throughout Northern Ireland. As with all underground cavities, the surface lands over abandoned mines may be susceptible to subsidence as a result of mine collapse. All historic mine sites in Northern Ireland classified as abandoned are vested in the Department for the Economy and are managed by the Northern Ireland Mines Oversight Committee (NIMOC).

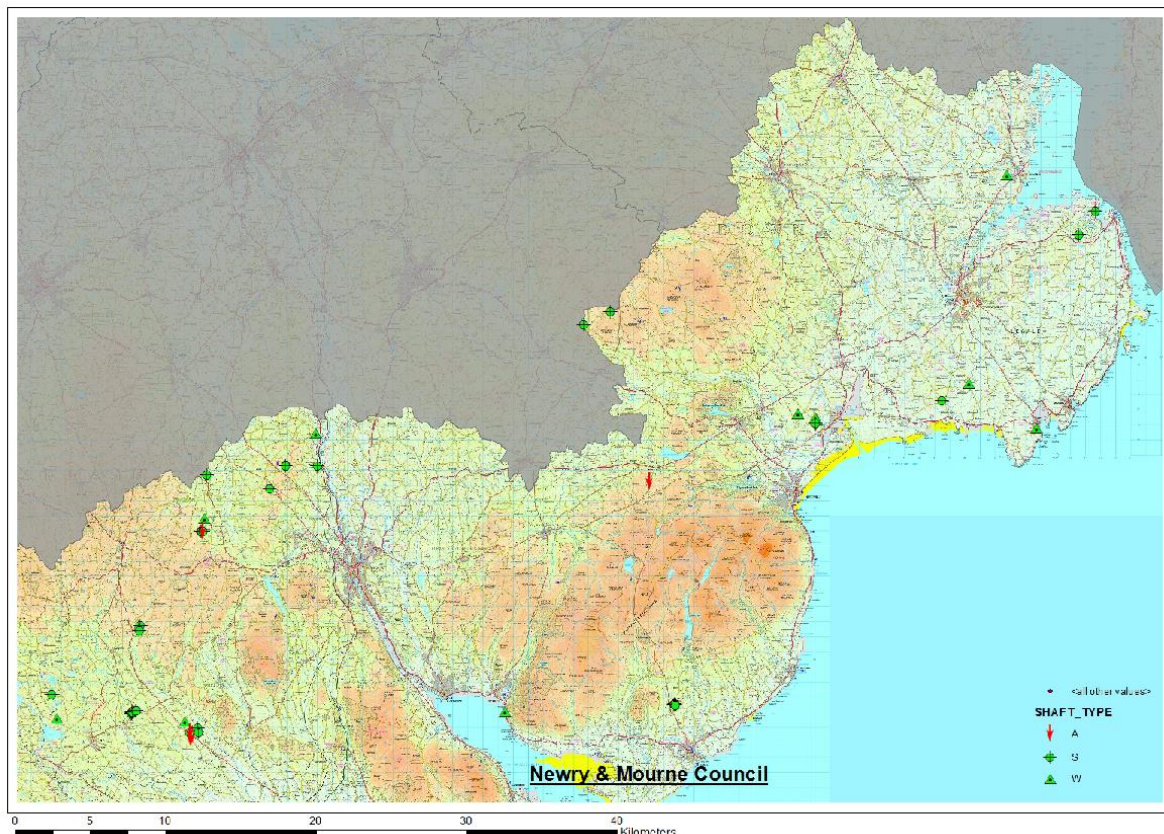
In Northern Ireland the most commonly occurring compressible materials include areas of peat, lacustrine and estuarine silts and clays. Subsidence of structures in areas underlain by such material can occur if the foundations are inadequate. In addition, differential movement of the ground has the capacity to cause disruption to the infrastructure network.

The hazard posed by areas susceptible to land instability can be incorporated into procedures for land use planning to help aid future resilience. It is important that land stability be given adequate consideration for future planning of residential dwellings, commercial properties, infrastructure projects and recreational areas.

Newry, Mourne & Down District Council Overview: Landslide occurrences within the District Council area are not significant, however do occur in areas of steep sided slopes. Records indicate that several landslide events have been triggered by human activity during construction projects.

Small areas of soft alluvium and peat in river valleys and inter-drumlin hollows, and patches of peat in upland areas may be classified as compressible ground. The former may have more impact on development – a good example comes from the ground engineering problems caused by soft alluvial deposits in the Downpatrick area. The GSNI may have detailed information on the distribution of these types of deposits which can be made available to the Council, although some geological mapping within the Council area is still in progress.

The Newry, Mourne & Down District Council area contains a total of 51 shafts, adits and abandoned mine workings associated with lead and copper extraction, operating up to the end of the nineteenth century. These mines workings are generally small scale, shallow in nature and predominately composed of vertical shafts.



Groundwater (Intro): Groundwater is water that is underground in both the loose material (superficial deposits) above bedrock and in bedrock itself. Contrary to popular ideas, groundwater is not like surface water in that, typically, it is not found in underground streams and lakes. Groundwater fills the tiny void space between grains of material or the cracks in the ground. The proportion of voids in the ground affects how much water can infiltrate down through the ground to form what are known as aquifers. The greater the proportion of voids, the larger and more productive the aquifer will be.

As an example, the Sherwood Sandstone Aquifer in the Lagan Valley contains 20 times more water than the Silent Valley reservoir can hold. Groundwater can range in age from being only a few hours old to a few thousand years old. The natural attenuation processes that go on in the ground serve to remove harmful chemicals and bacteria out of groundwater. The water itself dissolves out minerals in the ground so that it takes on similar chemical characteristics. Although groundwater quality is variable across Northern Ireland, in general, groundwater is naturally found in a condition that is suitable for drinking without the need for any treatment making it a valuable and sought after natural resource.

In regards to Local Development Plans, groundwater can be viewed as a natural resource that requires careful protection and as a water source that can be used for growth and economic development. Availability of reliable water supply is a major interest for expanding multinational businesses which makes Northern Ireland an attractive place to establish operations. It is important that both aspects are given consideration so as to look after the valuable resource and to use it sustainably to enhance and support future development needs.

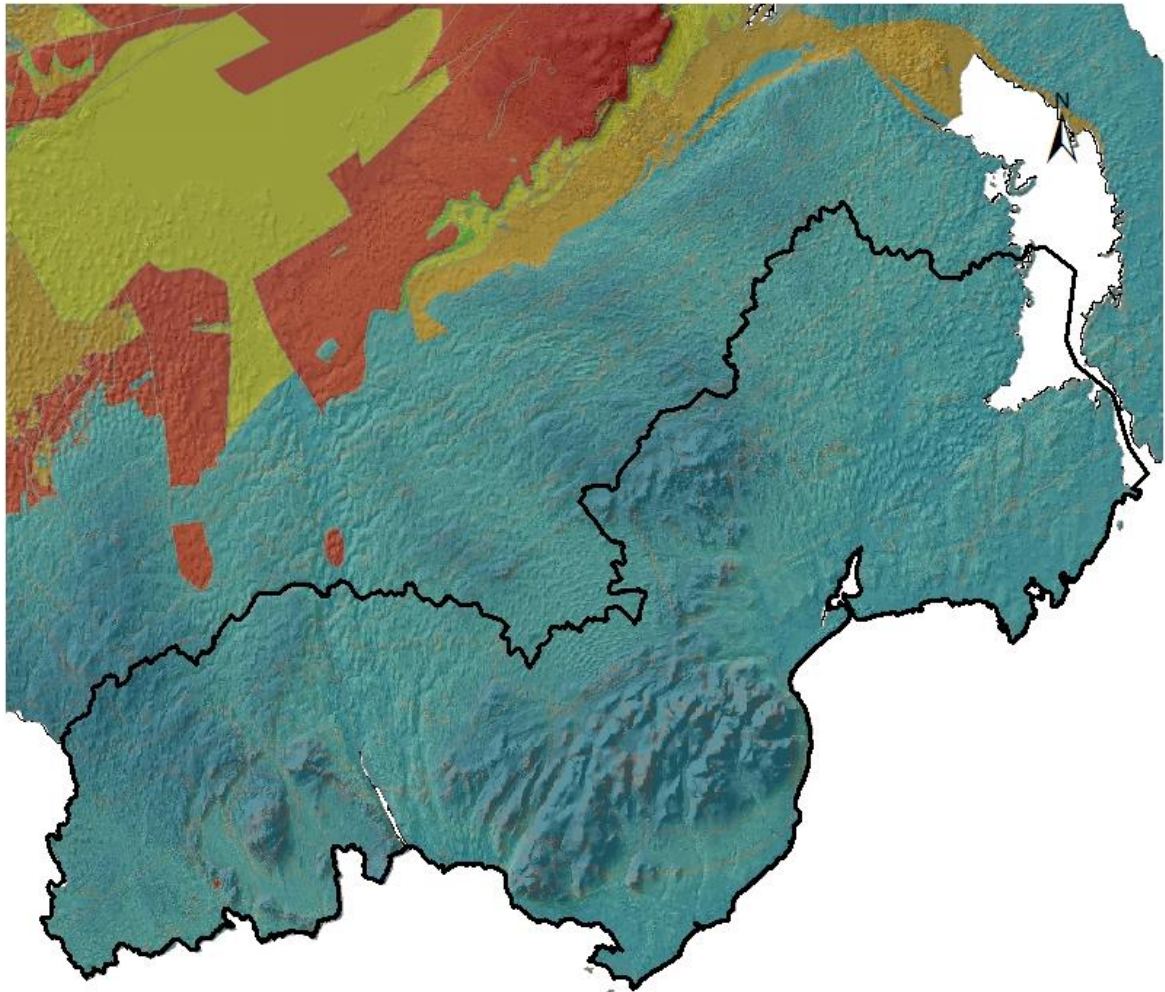
General Groundwater Overview: Newry, Mourne and Down District Council covers an area with relatively similar groundwater conditions. Figure 1 shows the distribution of different aquifer classes.

The whole of the council area has an aquifer classification of Bl(f). This means that the bedrock aquifers within the council area are fracture dominated and present a relatively low productivity potential - it would be highly unlikely when drilling a water supply borehole to achieve a yield of water capable of sustaining the requirements of medium to large industry.


However, our records show that around 100 boreholes or springs have been used for some form of water supply within the council area. Targeting fracture and fault zones within the granites, granodiorites and greywacke rocks has proven successful recently for a number of significant schemes including the redevelopment of the Newry Leisure Centre.

It is likely that most farms within the council area either have a groundwater supply or have explored the prospects of achieving one. Groundwater is commonly used by agriculture for animal welfare, washing and for cooling of milk.

It is known that mains water does not have full coverage to all roads within the council area. This means that properties that are not served by mains water are probably relying on some form of groundwater source for their water supply. This is most evident within the Mourne and around Slieve Gullion. A number of properties in these areas had boreholes drilled as part of the recent Rural Borewell Scheme to provide a reliable water supply for unserved domestic properties. In all cases, reliable supplies were achieved following careful hydrogeological examination of the target areas.



**Geological Survey
of Northern Ireland**

 Newry Mourne and Down Council Area

0 4 8 16 24 32 Kilometers

Aquifer Class

-  Bh(f)
-  Bh(f-k)
-  Bh(l-f)
-  Bl(f)
-  Bm(f)
-  Bp(f)

**Figure 1 - Aquifer Classification across the
Newry Mourne and Down Council Area**

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Aquifer Classification Map for Newry, Mourne and Down

As well as bedrock aquifers, superficial aquifers above the bedrock play a significant role for key industries within the council area. The Murlough Dunes provide a sustainable supply of water for Royal County Down Golf Club and the Slieve Donard Resort and Spa. The Mourne Plain forms an extensive and thick deposit of glacial outwash sands and gravels covering an area from Attical to Annalong and across to Cranfield. The fish processing industry at Kilkeel relies heavily on the supply of water from this significant aquifer. Other superficial aquifers are present within the council area that are not known to have been exploited as yet.

Current Status of Aquifers: In general, the current evidence shows that all of the aquifers within the council area are in a healthy condition. There are still significant prospects available for new abstractions to take place from the aquifers present within the council area. In particular, the superficial aquifers such as the Mourne Plain and the areas around Ballyhornan and Ardglass, present a unique opportunity.

Groundwater and LDP: The prospects for groundwater abstraction within the council area are moderate with certain areas better than others. It is important that such areas are not sterilised by development that would prevent future use of a valuable resource. Many parts of the council area are unserved by mains water or sewerage. This means that there are a significant number of private water supplies and on-site wastewater disposal systems in operation within the council area. The latter present a risk of contamination to groundwater. When applications are received for new developments requiring either a private water supply or an on-site wastewater treatment and disposal system, consideration must be given as to whether the ground conditions are appropriate for both. It may be the case that the prospects for a groundwater supply are low or that the ground may not be permeable enough to accommodate a soakaway system. In such cases, it would be ill advised to approve such developments.

Sustainable Use of Groundwater: It is important that groundwater is used sustainably. Groundwater is recharged from rainfall infiltrating into the ground. It is important that the rate of abstraction from an aquifer does not exceed the rate of recharge minus the ecological flow requirements of terrestrial water bodies such as rivers and lakes. If it does exceed it, groundwater levels will decline resulting in mining of groundwater. It is possible to manage this using groundwater monitoring and modelling.

Groundwater Regulation: Groundwater use is regulated by the Northern Ireland Environment Agency (NIEA). All abstractions of groundwater over 20 cubic metres per day require an abstraction license from the NIEA to operate. The licensing system operates on a 'first come first served' basis. Therefore once an operator has a license, the investment is protected from others who may also wish to use groundwater.

Groundwater quality is also regulated by measures brought in by the EU Water Framework Directive. These include Nitrate Action Plans to regulate mainly diffuse pollution by land spreading. The Pollution Prevention Control regulations require businesses to operate a license for the appropriate and careful management of all substances used during production processes. The principles upon which these regulations operate are the prevention of any hazardous substance being released into the environment and the limiting of the release of non-hazardous substances.