Underground extraction of minerals and rocks has taken place in Britain for more than 5000 years. A variety of raw materials have been extracted, ranging from precious metals such as gold and silver, building materials including limestone, sandstone, slate, industrial minerals e.g. gypsum, salt and potash and many more. Mining has been both surface and underground and the voids resulting from past underground mining activity could pose a possible hazard.

The Mining Hazard (not including coal) data draws together a diverse range of information derived from a variety of sources. The geology (bedrock and superficial) forms the primary constraint on distribution; this data is drawn from DiGMap-GB50 version 7 (the digital geology of Great Britain). Additional information has been sourced by literature searches identifying historic locations of former workings and from in-house experts. The information from these various sources has been assembled, interpreted and compiled to produce a single digital dataset indicating the geographic location and spatial extent of former mine workings.

**Mining of coal is specifically excluded** from this dataset and associated enquiries on past coal mining should be directed to the Coal Authority. This includes other commodities, such as iron ores, ganister and clays, produced from the working of some coal mines.

The data is stored in an ESRI shapefile format with information relating to individual polygons stored in an attribute table. The structure and content of this table is described in [Class descriptors](#).

**Background**

Public understanding of the effect of ground conditions to the safety of their property and the implications for the value of their property is growing. Local councils are under increasing pressure from central government to provide environmental information. Information about geological and anthropogenic hazards is needed, in particular, the identification of areas with a potential for ground movement.

In response to this, The BGS initiated a development programme to produce datasets that identified and assessed potential geohazards that threaten the human environment in Great Britain. The mining hazard (not including coal) maps the distribution of our historical mining legacy and forms part of a comprehensive suite of geohazard datasets. Other datasets generated by the BGS development programme are:

- Six ground stability hazard datasets (GeoSure)
  - collapsible deposits, compressible ground, soluble rocks, running sand, landslides, shrink-swell;
- Superficial deposit thickness models;
Who might require this data?

The Mining Hazard (not including coal) data provides essential information for planners and developers working in areas where former underground mine workings may have occurred.

Our mining legacy may lead to financial loss for anyone involved in the ownership or management of property, including developers, householders and local government. These costs could include increased insurance premiums, depressed house prices and, in some cases, engineering works to stabilise land or property.

Equipped with knowledge about potential occurrences, preventative measures can be put in place to alleviate the impact on people and property. The cost of such prevention may be very low, and is often many times lower than the repair bill following ground movement.

What the dataset shows?

The dataset provides information on the areas where past underground (non coal) mining has occurred. The presence of former underground workings, particularly where shallow, may collapse and cause surface settlement. These areas represent areas where underground voids may have been left as a consequence of past underground mining activity, and provide an assessment of the likelihood of the existence of such mining.

The data is divided into six classes which are used to indicate different degrees of likelihood of the existence of past underground non-coal mining so that an informed judgement can be made of the vulnerability to ground movement.

The defined mining areas are based on a combination of geological factors relating to the known distribution of mineral veins, building stones and other commodities known to have been mined. This data is supplemented by information on known and suspected locations of workings.

It should be noted that this is not an assessment of mining instability but it does identify the likelihood of past non-coal mining at any particular location.

The data does not attempt to classify the risk of instability; and, even where undermined, the workings may be stable and therefore either present no risk of subsidence, or be at such a depth that even if collapse has occurred, the surface will not be affected. The user is advised to seek further advice on the existence of known workings and, if present, their potential impact on surface stability.

Stabilisation by remedial treatment is not taken into account in this dataset. The impacts of mining methods, such as roof collapse behind longwall workings, where surface impacts occur within a few years of the mining activities following which surface effects are minimal, have also not been considered. Because of these factors, some previously extensively mined areas have been rated E
but may not have any surface stability issues as a result of mining.

Class descriptors

**Underground mining is not present**
There is no known past underground mining because the rock types present are such that no commodities or metal ores have been worked by underground mining methods. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.

(A) Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered.

Presence of past underground mining is not known to have occurred. Areas are categorized on the basis that the rock types present are known to have been worked in other areas. Areas therefore have the potential for underground mining but there is little or no evidence of mining activity.

Class A examples include:

1. Areas where minor mineral veins may be present on which it is possible that there have been attempts to work these by underground methods
2. Areas of chalk where no evidence of working has been recorded

It should be noted, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.

(B) Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered.

Presence of past underground mine workings may occur but workings of small limited extent. Rock types present could support small scale underground mining. All such occurrences are likely to be of minor localised extent and infrequent.

Class B examples include:

1. Areas where small mineral veins may be present on which it is possible that small scale mining has been undertaken.
2. Sandstone (for building stone) areas where bedrock geological formation e.g. Elland Flags are present but no evidence of working is found at the location.
3. Salt (brine) workings which have been recently abandoned. Areas of known working using controlled extraction methods.

It should be noted, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.
(C) Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered.

Presence of past underground mine workings may be present. Underground mining is likely to have been of limited extent.

Class C examples include:

1. Chalk areas where the approximate location of workings rather than an exact location are known.
2. Slate workings e.g. Woodhouse Eaves (Leicestershire) where working is known to have occurred but exact location is not known.
3. Vein mineral areas of North Pennine orefield which surround worked mineral veins but which contain no mapped veins and no actual evidence of underground working.

It should be noted, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.

(D) Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered.

Presence of past underground mine workings are probable. These are areas known or suspected to contain underground mining for minerals and/or other materials.

Class D examples include:

1. Mineral veins these are areas within 500 m of mapped mineral veins within which it is likely that mining activities may have occurred and subsidiary veins explored and exploited.
2. Bedded ironstone workings where ironstone is extracted in association with coal but is not the primary mineral.

It should be noted, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.

(E) Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered.

Presence of past underground mine workings are known or suspected to contain underground workings for minerals and/or other materials, extent of workings are likely to be extensive. No consideration has been given to the effects of remediation and it may be necessary to check if any remediation has been carried out.

Class E examples:

1. Mineral veins areas within 200 m of mapped mineral veins within which it is likely or known that mining activities may have occurred.
2. Areas where hydraulic limestone is known to have been worked at Barrow-on-Soar (Leicestershire)
3. Gypsum working at West Leake (Nottinghamshire) where the extent of workings has been mapped from published documents.

It should be noted, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. Coal mining is not covered by this data, and a Coal Authority mining search maybe required.

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