

Radon potential maps

Identification of at-risk areas

Don Appleton, Keyworth

adon is a naturally occurring radioactive gas which is derived from the radioactive decay of uranium. Some radon released from rocks and soils will enter buildings and may reach high concentrations in some circumstances. The radon level in individual homes can be influenced by the construction method, the degree of ventilation and how the home is used. If the solid radioactive decay products of radon gas are breathed in, they will damage the lung tissue and increase the chance of developing lung cancer. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in dwellings of 200 Becquerels per cubic metre (Bq m-3). The Government recommends that if the radon concentration in a home exceeds the Action Level, radon reduction measures should be taken as soon as practical. Radon reduction measures are usually simple, effective and comparable in cost to work such as dampproofing and timber treatment.

Since 1987 more than 350 000 Government-funded radon tests have been carried out on individual buildings. The National Radiological Protection Board (NRPB) has used this radon test data to draw up maps of radon prone areas which show the estimated percentage of homes exceeding the Action Level for each 5 km square of the Ordnance Survey National Grid. These maps have been used to identify those homes most likely to have high radon levels and also areas where new dwellings should be protected against radon.

Research by the BGS has demonstrated that the variation in radon levels between different parts of the country is mainly controlled by the underlying geology. An alternative radon potential mapping method has been developed in which the radon risk is estimated for geological units rather than grid squares. This mapping method is generally effective in areas where enough house radon results are available but requires further development in restricted parts of south-west England where uranium mineralisation in faults crosses several geological units.

The Radioactive Substances Division of the Department of the Environment, Transport and the Regions (DETR) has contracted the BGS to work in collaboration with the NRPB to produce a series of twenty 1:50 000 scale geologi"... research by the BGS has demonstrated that the variation in radon levels between different parts of the country is mainly controlled by the underlying geology ..."

cal radon potential maps covering the most radon prone parts of Derbyshire, Northamptonshire, Nottinghamshire, Leicestershire, Lincolnshire, Oxfordshire, Shropshire, Somerset and Yorkshire. The NRPB will produce a 1 km grid map of south-west England. The main purpose of the maps is to identify with greater precision the location of homes likely to be above the radon Action Level and to inform any future radon measurement campaigns.

The BGS is also carrying out a 1:250 000 scale geological radon potential assessment of England and Wales on behalf of the Building Regulations Division of the DETR. A map showing where basic and full radon protective measures are required in new dwellings will be produced for incorporation in the revised Building Research Establishment Report 'Radon: guidance on protective measures for new dwellings.'



Extract from the provisional 1:50 000 scale geological radon potential map of the Kettering area, Northamptonshire. Pink, blue and white denote areas where greater than 10 per cent, 5-10 per cent and less than 5 per cent, respectively, of homes are likely to be above the Action Level (Topography based on the 1974 Ordnance Survey 1st Series 1:50 000 Kettering & Corby (Sheet 141) map with the permission of The Controller of Her Majesty's Stationery Office © Crown Copyright. Ordnance Survey licence number GD272191/1998).