



Radon concentrations in abandoned mines, Cumbria, UK: health implications for industrial archaeologists.

Gavin Gillmore (1), Hossein Alizadeh Gharib (1), Antony Denman (2), Paul Phillips (2), and Dave Bridge (3)

(1) Kingston University, Geography, Geology and the Environment, Kingston-upon-Thames, United Kingdom (g.gillmore@kingston.ac.uk, 020 8547 7497), (2) University of Northampton, Applied Sciences, Park Campus, Boughton Green Road, Northampton, NN2 7AL, UK (paul.phillips@northampton.ac.uk), (3) Cumbrian Amenity Trust Mining History Society, 3 Brigham Hill Mansion, Brigham, Cockermouth, Cumbria, CA13 0T1, UK

This paper presents a number of surveys performed in a nominally 'low radon risk' geographical area of the UK. The Cumbrian region was identified by the Building Research Establishment in its 1999 guide as an area without a significant radon problem in terms of installing radon protection in new homes. The geology of the region is varied, being within the Northern Pennine Orefield, but consists of granites, andesites, tuffs, carbonates, sandstones and shales. Mineralisation has taken place (mostly lead and copper ores) primarily along fault and fracture zones, one example being Copper Valley, northwest of Coniston village. This work quantifies the risk of radioactive exposure in a number of abandoned mine environments. High radon levels, up to 28,589 Bq m⁻³, have been measured in parts of one mine.

This study demonstrates that industrial archaeologists (such as the Cumbrian Amenity Trust Mining History Society members) and explorers of abandoned mines are at risk from radon exposure, and proposes a management scheme to allow industrial archaeologists to continue exploration whilst minimising risk to health.