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Geological and minerals planning research commissioned by the Department of the Environment in and near south-west England

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The Department of the Environment (DOE) commissions a programme of geological and minerals planning research, with a current value of about £"l.5 million per annum, in support of its own policy requirements. The programme includes work on minerals resources, environmental effects of mineral working, land instability and applied geological mapping (DOE 1988). This paper summarises geological work in the South West planning region (Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset and Wiltshire) and mentions national studies which are relevant.

High levels of demand for minerals (and, thus, of land from which to work them), disturbance during extraction, and effects left by past working are a source of contention. Such problems can be reduced by working minerals in the least damaging locations. Planning for extraction and for safeguarding of minerals from sterilisation by other types of development requires information on resources. The Department has commissioned a large number of such studies, principally of aggregate resources. Those in and near the region (Fig. 1 and DOE 1987) have concentrated on: sand and gravel resources of parts of Gloucestershire, Wiltshire and Dorset; sandstone resources; and celestite in the area north of Bristol.

A study of Mendips limestone and a national project on very high purity limestones are in preparation. Working marine sand and gravel can reduce the amount of land taken for extraction. A method of marine resource assessment has been developed and is being applied off the Wessex Coast. The possible need for work on the Bristol Channel will be considered shortly.

The amount of land taken can also be reduced by using industrial by-products and waste materials in place of some minerals. The need for further research on the large quantities of waste sands from china clay processing in Devon and Cornwall is being discussed.

Great Britain has a wide variety of land stability and safety problems, natural and man-made. These include landslides, rock falls, subsidence, mineshafts, compressible ground, erosion, flooding, chemical contamination and seismicity. Occurrences may cause alarm and risks to life or health. Property can be damaged, industrial production disrupted, land values reduced and investment deterred. Conversely, stable land gives opportunities for cost-effective development and stable underground space, for example, can be used for storage.

The Department is preparing guidance on the relevance of land instability to planning to help in minimising risks, the placing of development in suitable locations and in bringing unstable land back into productive use. Research is commissioned to aid these objectives including a series of national reviews to assess the scale of problems due to mineshafts, mine instability, landsliding, quarry face stability, natural underground cavities, seismicity and foundation conditions. Reviews on flooding, erosion, deposition and ground "contamination" due to high natural concentrations of radon, methane and heavy metals are being considered. Amongst the results of the reviews are regional planning atlases and data bases.

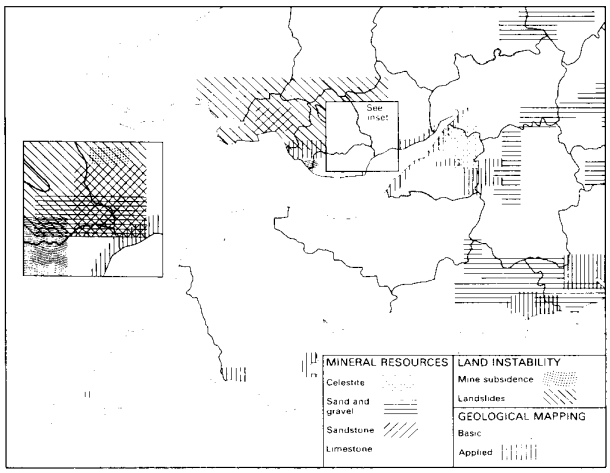

Figure 1. Research commissioned in and near the South West Region.

Risk assessment techniques are being developed for mine subsidence, landslides and seismicity. Seismic monitoring has been funded and improved national monitoring arrangements are being discussed.

Until the early 1980's, the Department commissioned standard geological mapping including several areas in the region (Fig. 1). However such maps do not give specific information on many earth science factors relevant to mineral and water resources, waste disposal and pollution potential, agricultural potential, land instability, flooding and ground contamination. In addition specialist maps are not readily interpreted by potential users who have little or no earth science training. The Department therefore commissions applied geological mapping exercises which are intended to alert planners and developers to opportunities, problems and the need to seek professional advice. Six studies have been carried out in the region and one, on the engineering geology of the Severn Levels, is in preparation.

Many of the Department's commissioned studies give rise to data archives or data bases which are valuable reference sources. Whenever possible these are made available to the public. A study of the Southampton area, jointly funded by the Department and the British Geological Survey, is investigating interactive digital mapping for the production of applied maps which could be continuously updated by adding new information to the data base.

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Department of the Environment, 1987. Geological and minerals planning research: projects completed, in progress and in preparation. London, 57pp.
Department of the Environment, 1988. Review of the geological and minerals planning research programme. London, 100pp.