

# science summary



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SCHO0207BLXY-E-P

## Baseline report series

Science Summary SC990024/SS

The Environment Agency has published a series of reports with the British Geological Survey, which assess water quality in 23 important aquifers throughout England and Wales. These reports record backgrounds or “baselines” of water quality for different aquifers, which can be used to inform decisions about remediation and measure improvements in water quality in the future. These will be invaluable to regulatory bodies, such as the Environment Agency, users of groundwater, including water companies, industry and agriculture, and all those involved in the protection and remediation of groundwater.

In its natural state, groundwater issuing from springs is generally of excellent quality and an essential natural resource. However, the natural quality of groundwater in our aquifers is continually being modified by the influence of man. This occurs due to groundwater abstraction and the consequent change in groundwater flow, artificial recharge and direct inputs of manmade pollutants. A thorough knowledge of the quantity and quality of groundwaters in our aquifers, including a good understanding of the physical and chemical processes that control these, is therefore essential for effective management of this valuable resource.

About 35 per cent of public water supply in England and Wales is provided by groundwater resources, though in the south and east of England this figure exceeds 70 per cent. Groundwater is extremely important for private water supplies and in some areas, often those with the highest concentration of private abstractions, alternative supplies are not available. In addition, groundwater flows and seepages are vital for maintaining summer flows in rivers, streams and wetland habitats, some of which rely solely on groundwater, especially in eastern and southern England. The quantity and quality of groundwater is therefore extremely important to sustain both water supply and sensitive ecosystems.

Until now there has not been a universally accepted way of defining the natural “baseline” quality of groundwater. We need such a standard as the scientific basis for defining natural variations in groundwater quality and whether or not pollution is taking place. This is essential for determining the baseline to which remedial measures must, or can, be taken. Naturally high concentrations of some elements in particular areas may make it impossible or uneconomic to remediate to levels below the natural background which may already breach certain environmental standards. Similarly, it is not uncommon for existing limits for drinking water quality to be breached by entirely natural processes. Robust baseline values help us to assess and remediate such problems.

This series of Baseline Reports assesses the controls on water quality which are responsible for causing the natural variations seen in groundwater and provides a background for assessing the likely outcomes and timescales for restoration. The report builds on a scoping study of England and Wales, carried out in 1996 by the British Geological Survey for the Environment Agency, which reviewed the approach to be adopted in producing a series of reports on the principal aquifers in England and Wales. The initial phase of this work was completed in 1998 and comprised reports on seven aquifers. This report forms part of the second phase of the work that will extend coverage to all the important aquifers in England and Wales. The Baseline reports will be of use not only to regulatory agencies but also to all users of groundwater, including water companies, industry and agriculture, and all those involved in the protection and remediation of groundwater.

This summary relates to information from Science Project SC990024, reported in detail in the following output(s):-

**Title:** The Triassic Sandstones of the Vale of York  
**ISBN:** 978-1-84432-626-6      **February 2007**  
**Product Code:** SCHO0207BLXX-E-P

**Title:** The Permo-Triassic Sandstones of west Cheshire and the Wirral  
**ISBN:** 978-1-84432-627-3      **February 2007**  
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**Title:** The Permo-Triassic Sandstones of South Staffordshire and North Worcestershire  
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**Title:** The Chalk of Dorset  
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**Title:** The Chalk of the North Downs, Kent and East Surrey  
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**Title:** The Chalk of the Colne and Lee River Catchments  
**ISBN:** 978-1-84432-631-0      **February 2007**  
**Product Code:** SCHO0207BLYD-E-P

**Title:** The Great and Inferior Oolite of the Cotswolds District  
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**Title:** The Permo-Triassic Sandstones of Manchester and East Cheshire  
**ISBN:** 978-1-84432-633-4      **February 2007**  
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**Title:** The Lower Greensand of Southern England  
**ISBN:** 978-1-84432-634-1      **February 2007**  
**Product Code:** SCHO0207BLYG-E-P

**Title:** The Chalk Aquifer of Yorkshire and North Humberside  
**ISBN:** 978-1-84432-635-8      **February 2007**  
**Product Code:** SCHO0207BLYH-E-P

**Title:** The Bridport Sands of Dorset and Somerset  
**ISBN:** 978-1-84432-636-5      **February 2007**  
**Product Code:** SCHO0207BLYI-E-P

**Title:** The Devonian aquifer of South Wales and Herefordshire  
**ISBN:** 978-1-84432-637-2      **February 2007**  
**Product Code:** SCHO0207BLYJ-E-P

**Title:** The Great Ouse Chalk aquifer, East Anglia  
**ISBN:** 978-1-84432-638-9      **February 2007**  
**Product Code:** SCHO0207BLYK-E-P

**Title:** The Corallian of Oxfordshire and Wiltshire  
**ISBN:** 978-1-84432-639-6      **February 2007**  
**Product Code:** SCHO0207BLYL-E-P

**Title:** The Palaeogene of the Wessex Basin  
**ISBN:** 978-1-84432-640-2      **February 2007**  
**Product Code:** SCHO0207BLYM-E-P

**Title:** The Granites of South-West England  
**ISBN:** 978-1-84432-641-9      **February 2007**  
**Product Code:** SCHO0207BLYN-E-P

**Title:** The Ordovician and Silurian meta-sedimentary aquifers of central and south Wales  
**ISBN:** 978-1-84432-642-6      **February 2007**  
**Product Code:** SCHO0207BLYO-E-P

**Title:** The Millstone Grit of Northern England  
**ISBN:** 978-1-84432-643-3      **February 2007**  
**Product Code:** SCHO0207BLYP-E-P

**Title:** The Permo-Triassic Sandstones of Liverpool and Rufford  
**ISBN:** 978-1-84432-644-0      **February 2007**  
**Product Code:** SCHO0207BLYQ-E-P

**Title:** The Permo-Triassic Sandstone Aquifer of Shropshire  
**ISBN:** 978-1-84432-645-7      **February 2007**  
**Product Code:** SCHO0207BLYR-E-P

**Title:** The Chalk and Crag of north Norfolk and the Waveney Catchment  
**ISBN:** 978-1-84432-646-4      **February 2007**  
**Product Code:** SCHO0207BLYS-E-P

**Title:** The Carboniferous Limestone of Northern England  
**ISBN:** 978-1-84432-647-1      **February 2007**  
**Product Code:** SCHO0207BLYT-E-P

**Title:** The Lincolnshire Limestone  
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