EXECUTIVE SUMMARY

The EC Directive 98/83/EC on the quality of water intended for human consumption applies to all water intended for human consumption. The Water Supply (Water Quality) Regulations implement the Directive and set standards for the quality of the water supplied to premises by water companies as well as imposing monitoring requirements for the whole of the distribution network. The Directive and the Regulations provide that Member States and water companies respectively have met their obligations if failure to meet standards is attributable to the distribution system within premises, except in the case of premises and establishments where water is supplied to the public ("public buildings"). The Directive cites schools, hospitals and restaurants as examples of "public buildings". It is possible that specific national requirements could be required for monitoring and possible remedial action if deterioration in microbiological or chemical quality of drinking water occurred in the plumbing systems of public buildings. This project was undertaken to estimate the number of "public buildings" in England and Wales and the likely proportion that may breach one or more of the water quality standards and require remedial action.

In consultation with the Drinking Water Inspectorate (DWI) a total of 46 types of building were identified that can be considered as “public” in the context of the Water Quality Regulations. These fall into the broad categories of Education, Medical, Hostelries, Exhibition, Sports/leisure and Miscellaneous. The numbers of most types of building were estimated using the search facilities at the Yellow Pages internet site. For certain types of buildings (e.g. prisons) the numbers were estimated from other sources of information. It is estimated that there are approximately 225,000 public buildings in England and Wales (England 210,000; Wales 15,000).

A structured inspection and sampling programme was created to include a total of 200 buildings, split evenly across the 10 areas of England and Wales used in the Census. The buildings were selected randomly based upon relative occurrence and importance, ensuring that at least one of each type was included. Surveys of water supply arrangements were conducted first, and a suitable tap for sampling was identified. A detailed survey was then made of the plumbing between that tap and the entry of water into the building. This detailed survey included recording of the lengths and materials of pipework, type and number of fittings and whether water storage (e.g. cisterns) preceded the sampling tap. The results of the surveys were recorded on pro-formas. Subsequent visits were then made to geographically close groups of buildings to collect water samples. For each survey area, one analytical laboratory that was acceptable to DWI was identified and arrangements put in place for them to provide sample bottles and undertake the analysis.
Three sets of samples were taken for analysis:

1. a sample for microbiological analysis, without any prior preparation of the tap;
2. one or more samples for chemical analysis; and
3. a second sample for microbiological analysis, taken after cleaning and disinfecting the tap.

The samples were analysed for coliform bacteria, *E. coli*, enterococci, colour, conductivity, copper, hydrogen ion, iron, lead, nickel, nitrite, odour (qualitative), taste (qualitative), turbidity and zinc. A sample was also taken for on-site determination of chlorine, temperature and appearance.

All but three of the buildings (98.5%) were supplied by public water supplies. One building had UV irradiation installed upstream of the sampled drinking water tap and five employed ion-exchange softening of the drinking water supply.

A broad range of plumbing arrangements, materials and fittings was identified during the surveys. Various regulatory infringements were noted including poor insulation, lack of backflow prevention on appliances and lack of labelling to identify drinking water taps. However, in general such infringements would be unlikely to have an adverse effect on drinking water quality.

The appearance of most water samples was “clear” although 10 of the 200 samples were reported as “cloudy” or “coloured” (England 7/180; Wales 3/20). Water temperatures ranged from 8 to 25 °C with an average of around 15 °C. It is unlikely that cloudy, discoloured or excessively warm water would actually be consumed.

Bacteriological results for samples taken without prior preparation of the tap showed a number of failures, mostly for total coliforms. In contrast, the results obtained after disinfection of the tap – the normal sampling procedure – resulted in only a single failure (for enterococci).

Few failures were found for chemical parameters – one failure each for iron, lead and nickel. Re-sampling from buildings where metals results in excess of 50% of the standards were found generally confirmed the same level of concentration. Lead concentrations from lead-plumbed properties were generally low, indicating the success of plumbosolvency treatment by water companies.

Overall the level of compliance was high and comparable to that reported for statutory monitoring of water quality in supply zones.