



## PRIVATE WATER SUPPLIES – CASE STUDY 2013/01

### Why having regard to Regulation 5 is preventative and will save costly complex investigations and remedies

During August 2013, and by arrangement with the relevant local authorities, the Inspectorate visited a number of private supplies as part of a programme of technical audit looking at the implementation of Regulation 5 of the Private Water Supplies Regulations. This regulation prohibits the use of products that are not approved or the use of approved products in a manner that does not adhere to any conditions of use specified in the approval (<http://dwi.defra.gov.uk/stakeholders/private-water-supplies/reg5.pdf>). This case study describes the findings and learning points from a risk assessment of a private supply serving a population of 55 people (large Regulation 9 supply based on the volume of water used).

The supply derives from several spring sources. Water is collected in a holding tank and feeds by gravity to a service reservoir located downhill where the water is dosed with chlorine dioxide by means of a flow proportional system. The Inspectorate's audit confirmed two contraventions of Regulation 5.

First, the raw water holding tank had been rendered using an unapproved cementitious product. The use of an unapproved product in this context poses a risk for two reasons: there may be substances in the material that will leach out into the water impairing its quality and posing a potential danger to human health; additionally, if any material is not cured fully before water is

reintroduced into the tank, then reactions may occur between the water and the uncured material giving rise to a subsequent deterioration in the condition of the structure or water quality or both.

#### Figure 12: Leachate floating on the water surface

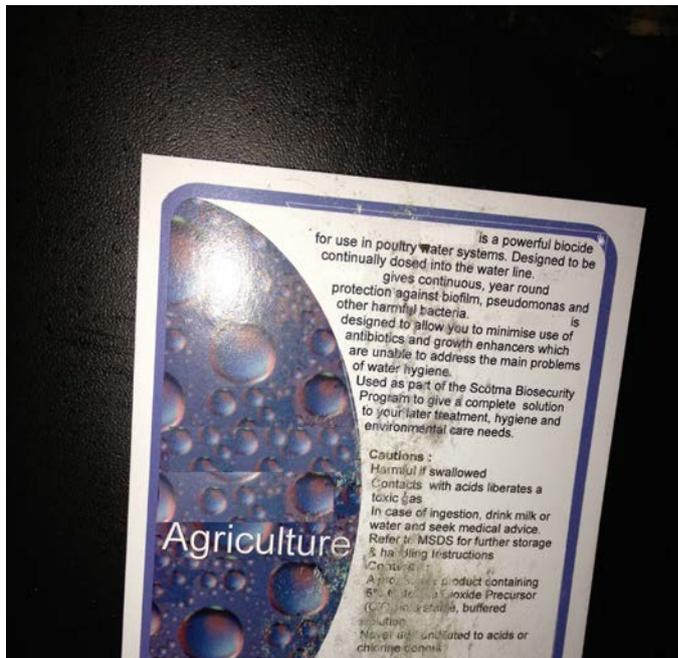
Figure 12 shows the leachate from the material floating on top of the water in the holding tank and illustrates the relatively large surface area to which the unapproved material was applied.





This indicates how the exposure to potentially harmful substances from the use of unapproved products can be substantial and why contravention of Regulation 5 should not be regarded as a trivial matter.

The action taken by the local authority had been to sample and test the material in the holding tank in an endeavour to determine whether this posed a risk to health. However, this sampling approach does not provide an equivalent level of protection to Regulation 5. The process for cementitious products involves a rigorous regime of approval, including the formulation of the product and the testing of product samples prepared in accordance with the manufacturer's instructions to BS EN standards by accredited laboratories. The purpose of this testing is to verify that there will be no adverse effect on water quality or health.



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Approval also involves a review of the manufacturers' instructions for use and the setting of any conditions that need to be adhered to when the product is applied on site. Retrospective testing after a problem has occurred, as carried out in this case, cannot determine reliably if the cause is due to the material itself or whether it has arisen as a consequence of the instructions for use being incorrect, or not followed correctly. Likewise, retrospective testing, without a full knowledge of the material composition and its method of application, cannot provide a robust assurance as to the future safety of the water supply. The second contravention came to light when the chemical dosing equipment and associated chemicals were checked. The system installed was a chlorine dioxide dosing system. The manufacturer of the system was one that does supply products listed by the Inspectorate as approved for use with drinking water; however, the product used was not approved. Instead, as shown in Figure 13, the product was intended for general agricultural purposes.

### Fig 13: Evidence that the dosing system was not of an approved type

The consequences of the use of a system intended for general agricultural purposes, as opposed to one specifically approved for drinking water, is that the chemical being dosed may be of a grade that is not sufficiently pure and thus contains contaminants, such as heavy metals, that will be added to the water. Additionally, the concentration of the active ingredient may be either too low or too high resulting in disinfection and water quality being compromised through under or overdosing. This contravention of Regulation 5 is particularly concerning because the system was sourced from a manufacturer and supplier of approved products, yet the wrong type of system was purchased and installed.





This case study illustrates two contraventions of Regulation 5 on one private supply where unapproved products were used, despite the ready availability of equivalent approved products. *The Inspectorate recommends that when carrying out risk assessments, investigating complaints or sample failures, and when enforcing private supply improvements, local authorities have regard to Regulation 5. Raising the awareness of private supply owners and operators whenever the opportunity presents will encourage compliant behaviour and prevent problems arising that can be difficult and costly to remediate retrospectively. For its part the Inspectorate has provided information to support awareness raising on its website (see <http://dwi.defra.gov.uk/private-water-supply/installindex.html> ).*

