

Policy Position Statement

Water quality implications of transferring treated water supplies

Purpose

This policy position statement sets out the water quality implications of transferring water between supply zones either within the same company or between companies in the case of both planned continuous transfers and water shortage emergencies.

CIWEM considers

1. In light of future water availability and the pressure to reduce abstraction there is likely to be an increasing case for water transfers between supply zones in the UK to maintain resilience.
2. There are risks associated with transferring treated water between supply zones and these need to be adequately addressed in a risk assessment to ensure that there is no deterioration in water quality to customers.
3. Drinking Water Safety Plans are an integral part of assuring the safety of drinking water. Anyone who is responsible for altering the supply arrangements on either a temporary or permanent basis must be fully conversant with the Regulatory requirements.
4. Further treatment or blending may be required to maintain drinking water quality standards for consumer acceptability at the receiving end following a water transfer.

CIWEM is the leading independent Chartered professional body for water and environmental professionals, promoting excellence within the sector.

Context

The UK Government's Water White Paper makes the case for using water resources more flexibly in the future in light of the Environment Agency's analysis of future water availability and the pressure to reduce abstraction where there is a risk of environmental damage or to meet Water Framework Directive targets. Improved interconnection within and between water companies on a relatively local scale could offset the need for new resources or infrastructure. OFWAT estimates that savings from improved interconnections across the country could be as high as £960 million over the lifetime of the assets and the Water Resources in the South East Group (WRSE) (an alliance of 6 companies and regulators) have suggested that greater

sharing between companies in the region could generate savings of over £500 million by 2035ⁱⁱ.

Transferring water can be energy intensive so the bulk transfers that are envisaged by the Government in the White Paper are to take place over a short distance, joining up water supply zones both within and between company networks, to incrementally build a more integrated water supply network. However there are water quality implications from moving bulk supplies of treated water even over short distances. Options for interconnection will need to be objectively assessed alongside alternative approaches in Water Resource Management Plans and subject to a risk assessment to ensure appropriate control measures are in place to ensure no deterioration in the quality of drinking water supplied. All bulk supplies between companies, and transfers to others such as new applicants or traded abstractions should be regarded by the receiving company as new sources that are subject to regulation 15 requirements. This is detailed in Drinking Water Inspectorate (DWI) Information Letter 6/2012ⁱⁱⁱ. The need for a risk assessment between water companies who share the same water source is emphasised within the body of the DWI Information Letter 8/2011^{iv}.

The need to transfer water from one operational area to another may also arise in order to maintain supplies during an emergency such as a drought. Water companies are required to have contingency arrangements for the provision of a continuous supply of wholesome water and so all transfers during such an emergency must be subject to a risk assessment as part of their planning. The risk assessment is required to eliminate issues arising from differing nature and composition of water being transferred to that previously passing through the receiving distribution system and assure water quality will be preserved.

Key Issues

The risk assessment must consider a range of issues that may potentially arise from, for example:

Allowing a soft, low alkalinity water to pass into a hard water area

- An increased degree of corrosion in unlined pipes giving rise to potential increased levels of iron and/or lead exceeding maximum acceptable concentrations.
- An increase in corrosion products may also give rise to an increase in discolouration or suspended sediment water complaints and the need for additional flushing of the distribution system to remove these deposits.
- The need to shield unlined pipes from further internal attack by providing an internal protective coating.
- The introduction of a soft water into a hard water area may result in increased de-zincification of brass water fittings.
- Costs of treatment will generally increase with the need to provide temporary or even permanent treatment to correct some of the above problems, such as the provision of phosphate dosing to combat rising lead levels.

- Sudden change in hardness and in particular iron levels can give rise to problems in industrial processes such as in the dyeing and finishing of textiles. Therefore, material changes in water quality need to be communicated to relevant commercial and industrial customers.

Allowing a hard, high alkalinity water to pass into a soft water area

- An associated increase in chloride and sulphate ions may lead to increased corrosion of copper and brass water fittings.
- Industrial processes that normally receive a soft water supply may need to provide an alternative supply, install a softening facility or move production in an emergency, for example, textile finishing, laundries and metal plating. Soft drink manufacturers may need to be informed.
- Consumer concern at noticeable changes in water, appearance of scale in kettles, chalk deposits on surfaces and other aesthetic changes.

Metaldehyde

- Metaldehyde is a selective pesticide used by farmers and gardeners to control slugs and snails in a wide variety of crops and can find their way into watercourses either directly during application or as a result of run-off during high or prolonged rainfall events. Water companies have legal programmes of work (Undertakings) agreed with the Drinking Water Inspectorate to reduce the risk of breaching standards set as part of drinking water quality regulations. Extending the use of water with elevated levels of metaldehyde to a water supply zone, such that the zone receives water above the drinking water Prescribed Concentration Value (PCV) for pesticides and that is not subject to an undertaking, requires a risk assessment and discussion with the Drinking Water Inspectorate before implementation. Additional treatment and blending may be required.

Other operational considerations

- Change of source e.g. ground water to surface water may cause consumers to notice a change in taste, odour and chlorine concentrations.
- Fluoridation – the need to prevent fluoridated water passing into a non-fluoridated area may require the need to totally stop fluoridation and this must be highlighted in the risk assessment.
- Plumbosolvency control - the need to prevent non phosphate dosed waters passing into areas which require plumbosolvency control. This must be risk assessed to consider the impact on lead concentrations at consumers' properties and whether additional communications are required.
- Disinfection – the mixing of chlorinated and chloraminated waters may give rise to TCP type odours in the blended water. Enhanced water quality monitoring may be instigated to identify if further remedial treatment (e.g. booster chlorination or alternative water provisions) are required.

- Blending – the transfer of water that is normally blended with other water for quality requirements before going into supply e.g. for the reduction of nitrate levels, may not be allowed to go directly into supply if alternative dilution water is not available.
- Reverse flows – increasing in flow velocity or redirection of flows along distribution mains may cause re-suspension of deposits within the mains and give rise to discolouration issues. Remedial flushing or conditioning may be required to mitigate against this issue at the time of the transfer. If emergency transfers make use of connection pipes that are generally closed, there may be a need for some initial flushing or the use of a bleed to keep the mains wholesome.
- Flow monitoring – control measures and commissioning procedures should be agreed and practiced on a regular basis with flow and quality monitoring.
- Long distance transfers – treated waters that have been disinfected but still contain trace quantities of natural organic material may often generate taste and odour problems during their transport over long distances. Therefore, further treatment may need to be considered in the risk assessment exercise to cover these and other potentially associated increases in disinfection by-products and microbiological re-growths. There may also be a need for booster chlorination to maintain a disinfectant residual in the water delivered to all consumers.
- New pipework – the infrastructure to transfer the water may not be already available and the installation of new pipework that is suitable to transfer treated water may be necessary.
- Tankering – when tankering water the source of supply is critical and can pose the same risks as detailed above where the water is introduced to supplement a supply, for example, into a service reservoir. Where consumers are being supplied directly from a tanker there are requirements within the Water Supply (Water Quality) Regulations that specify monitoring arrangements for tankers.

Communication

- Documentation – during an emergency transfer all operational procedures, actions and necessary water quality monitoring need to be documented. In order to provide a record and an essential audit trail to trace any water quality issues that may subsequently arise.
- Communications – it is important that all consumers and interested authorities are informed when emergency transfers are likely to significantly affect the quality of the received water and to report the actions taken to mitigate these changes during an emergency.

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Note: CIWEM Policy Position Statements (PPS) represents the Institution's views on issues at a particular point in time. It is accepted that situations change as research provides new evidence. It should be understood, therefore, that CIWEM PPS's are under constant review, that previously held views may alter and lead to revised PPS's. PPSs are produced as a consensus report and do not represent the view of individual members of CIWEM.

References

- i Environment Agency. 2011. The case for change – current and future water availability <http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho1111bvpep-e-e.pdf>
- ii Defra. 2011. Water for Life (Water White Paper). <http://www.official-documents.gov.uk/document/cm82/8230/8230.pdf>
- iii Drinking Water Inspectorate. 2012. Information letter 6/2012 Regulation 15 compliance arrangements <http://dwi.defra.gov.uk/stakeholders/information-letters/2012/06-2012.pdf>
- iv Drinking Water Inspectorate. 2011. Information Letter 8/2011 Objectionable taste and odour in water supplies in North-East London between January and March 2010 <http://dwi.defra.gov.uk/stakeholders/information-letters/2011/08-2011-annexa.pdf>
- v The Water Supply (Water Quality) Regulations 2010 <http://www.legislation.gov.uk/wsi/2010/994/contents/made>