



## Drinking water mains leakages in Scotland

### Summary

Scotland's drinking water infrastructure is facing a critical challenge regarding significant leakage from its mains system. Despite ongoing efforts, the current rate of water loss from the system remains unacceptably high, posing significant risks to the nation's water security, environmental sustainability, and economic efficiency. Immediate and comprehensive actions are imperative to address this pressing issue and safeguard the future of Scotland's water resources.

### Background

Water is a precious and finite resource, essential for life, nature, and economic growth. Scotland's drinking water mains system, which spans over 49,000 kilometres across the country, plays a crucial role in delivering this vital resource to homes, businesses, and communities<sup>1</sup>. However, the water mains system is plagued by leakage, resulting in the loss of millions of litres of treated water every day.

According to the latest information from Scottish Water, around 30% of treated drinking water supplied was lost from Scotland's drinking water mains in 2022/23<sup>2</sup>. This translates to a staggering loss of over 454 million litres of treated water, enough to supply over 3,200 households<sup>2</sup>.

Water is treated to a high standard for supply as drinking water, using chemical and mechanical processes. The energy and resources expended in treating and distributing the lost water contribute to increased greenhouse gas emissions and a larger carbon footprint<sup>3</sup>.

Leaks also place a greater burden on raw water supplies. Drawdown of reservoir levels and over-extraction of groundwater can have compounding negative impacts on surrounding ecosystems. As reservoir volumes reduce, shoreline vegetation dries out and habitat areas for fish, water birds, amphibians, invertebrates, and plants shrink. Groundwater abstraction can lead to lower water tables in adjacent wetlands and riparian areas dependent on groundwater discharge. This can make it harder for plants to access subsurface moisture during dry periods, and can lead to dieback of vegetation like willows, and wetland meadows. The loss of vegetative cover and organic soils diminishes critical breeding habitat for birds, amphibians, mammals and terrestrial invertebrates. Groundwater depletion also reduces baseflows in streams, stressing aquatic species. Overall, drawdown from surface and groundwater sources degrades the quality and quantity of water resources needed to sustain healthy plant and animal communities.

Failure to address the leakage issue could have far-reaching consequences for Scotland's water security, economic performance, and biodiversity conservation efforts. In the midst of a climate

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<sup>1</sup> <https://www.scottishwater.co.uk/about-us/our-network>

<sup>2</sup> <https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Key-Publications/Annual-Reports/SWAnnualReport2023.pdf>

<sup>3</sup> <https://assets.publishing.service.gov.uk/media/5a7cbfd4e5274a38e5756843/scho0708bofv-e-e.pdf>



emergency<sup>4</sup> continued water loss exacerbates the strain on already limited freshwater resources, potentially leading to supply disruptions and water scarcity during periods of drought or high demand. Secondly, the financial burden of treating and pumping lost water translates into higher operational costs for Scottish Water, which may ultimately be passed on to consumers in the form of increased water charges. Moreover, the environmental impact of leakage cannot be overlooked, as the energy and resources required for water treatment and distribution contribute to greenhouse gas emissions and further strain on Scotland's natural resources.

### Action required

To effectively tackle Scotland's leakage problem, a comprehensive and coordinated approach is required, involving all stakeholders. This approach should encompass the following key elements:

1. **Infrastructure Renewal and Maintenance:** It is imperative that leakage from the water main system is reduced by prioritising the systematic replacement and rehabilitation of aging water mains, valves, and other critical infrastructure components. This will require significant prioritised investment and resources to ensure a proactive and strategic approach to infrastructure renewal.
2. **Advanced Leakage Detection and Monitoring:** Investment in state-of-the-art leakage detection technologies, such as acoustic sensors, smart meters, and remote monitoring systems will enable the pinpointing of leaks promptly and initiate timely repairs, minimising water loss.
3. **Pressure Management and Optimisation:** Implementing effective pressure management strategies, including the installation of pressure-reducing valves and the optimisation of system pressures will maintain optimal pressure levels, significantly reducing the likelihood of leaks and bursts.
4. **Water Demand Management:** Scotland has the highest per capita water usage in the UK, and one of the highest in Europe. As a water-rich country, many consumers consider drinking water as a limitless resource. Reducing our water consumption should be a priority for all sectors. Water conservation efforts should be promoted through public education campaigns, incentives for water-efficient appliances and fixtures, and the adoption of water-saving technologies in both residential and commercial sectors. Reducing overall water demand can alleviate stress on the distribution system and minimise the potential for leaks.
5. **Encourage the adoption of grey-water re-use:** Around a third of water supplied to households is used to flush toilets. Not only is this a waste of resources, it places an unnecessary burden on the supply system. Despite first being identified as a potentially useful approach to reducing water usage some 20 years ago, grey water recycling has not been widely adopted in the UK. To accelerate the adoption of this technology a grant scheme should be developed to encourage and enable householders to retro-fit grey water systems. In addition, the installation of grey water systems should be encouraged through the planning system.
6. **Stakeholder Collaboration and Public Engagement:** Foster strong collaboration among water utilities, regulatory bodies, local authorities, and the Scottish government to ensure a coordinated approach to leakage reduction. Additionally, engage with the public and raise

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<sup>4</sup> <https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/>





awareness about the importance of water conservation and the impact of leakage on Scotland's water resources.

By implementing a comprehensive strategy that addresses infrastructure renewal, advanced leakage detection, pressure management, water demand management, and water re-use, Scotland can significantly reduce water loss, enhance water security, improve environmental sustainability, and achieve long-term economic efficiency in its water supply system. Failure to act now will only exacerbate the risks and consequences, jeopardising the nation's ability to meet its water needs and compromising its commitment to environmental stewardship. In addition, taking the actions described above would make a significant contribution to Scotland's Circular Economy ambitions.

**Scottish Environment LINK is the forum for Scotland's voluntary environment community, with over 40 member bodies representing a broad spectrum of environmental interests with the common goal of contributing to a more environmentally sustainable society.**

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