Bolton Low Houses

Infiltration Reduction Plan

Last Updated: March 2025

United Utilities

Water for the North West

Executive summary

Bolton Low Houses in Cumbria is currently in the monitoring stage (see Figure 1) to address infiltration and reduce spills at the Bolton Low Houses Wastewater Treatment Works Storm Tank Overflow (017570012ST). A desktop assessment concluded that there is the possibility of groundwater infiltration but not likely a significant amount that would reduce spill count if addressed. Surveys confirmed the presence of infiltration and remedial works were completed in Spring 2025.

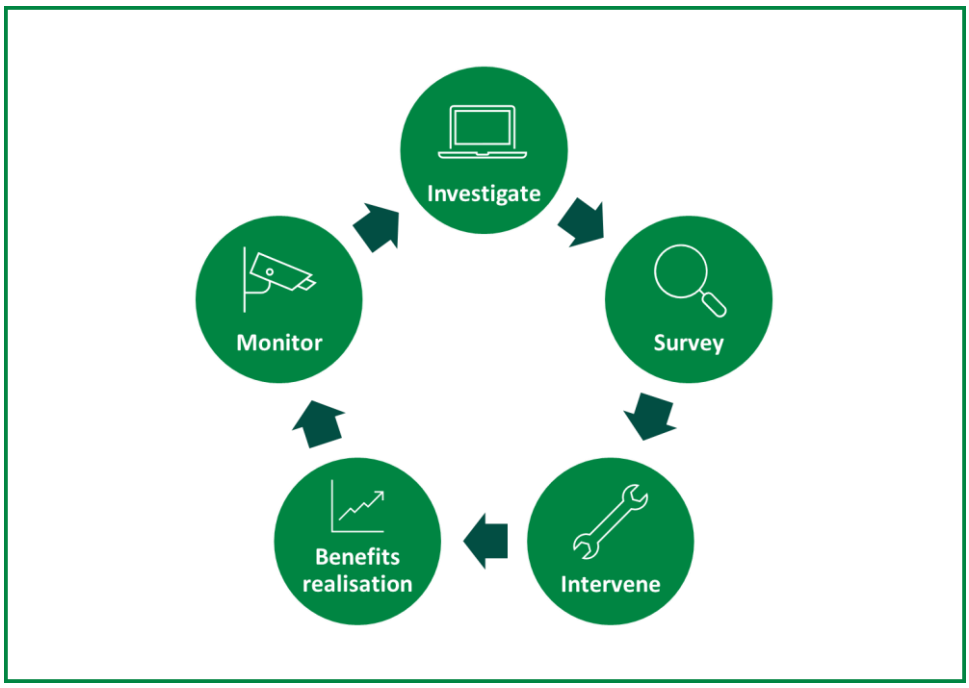

Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water can enter our wastewater pipes that they were not designed to receive. One source of these additional flows can be groundwater infiltration which can occur through pipe defects, leaky joints or issues with manholes. Extra water in the network can cause the sewer capacity to be exceeded, leading to sewer flooding or contributing to storm overflow activations.

As part of our ongoing work to maintain an effective network and achieve Better Rivers for the North West, our Infiltration Reduction Plans demonstrate our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Bolton Low Houses drainage area and the associated overflow, Bolton Low Houses Waste Water Treatment Works Storm Tank Overflow (017570012ST). In 2022, infiltration was identified as a potential leading cause of the storm overflow discharging. The purpose of this plan is to capture the process to investigate, identify and address significant groundwater infiltration.

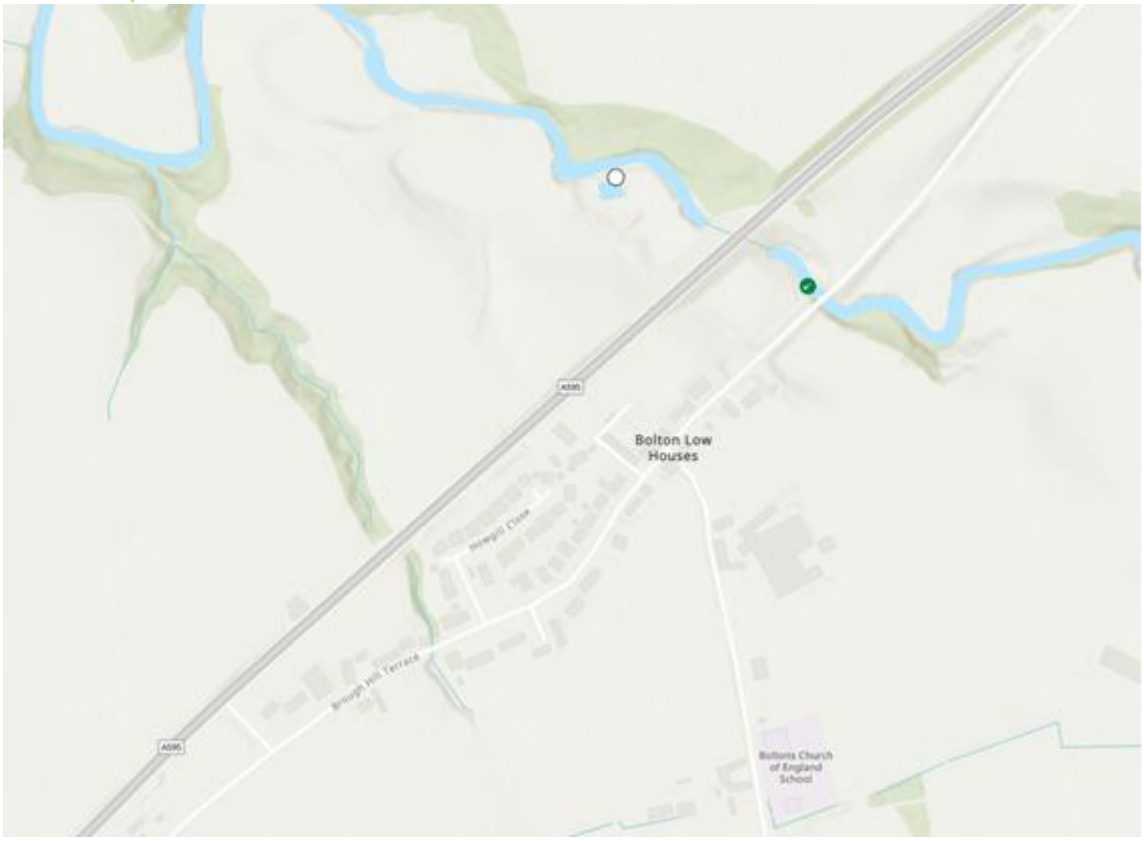

Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The white dot, North of Bolton Low Houses, marks the Bolton Low Houses Overflow.

Bolton Low Houses is a small village in Cumbria, South of Wigton. It lies just North of the Lake District National Park border, close to the River Waver and is surrounded by rural land. The land to the southeast falls towards the village and continues down to the River Waver.

Investigate

A desktop study was undertaken using available data to understand the extent of infiltration in the sewer network of the drainage catchment. The following data (where available) was analysed to determine the scale and location of potential infiltration:

- Relevant flow and depth data
- Operational information
- MCERTS Data
- Hydraulic models of the catchment
- River Levels
- Groundwater (borehole) data
- Spill analysis
- Topographical and Sewer maps

The assessment concluded that significant groundwater infiltration was unlikely in the catchment. However, there were several indicators that suggest that surveys are required to clarify whether infiltration is present, including the identification of a sewer crossing underneath a stream.

From these findings, it was recommended that CCTV surveys are completed to see if there is infiltration of the water course into the sewer. CCTV surveys can also identify if there is land drainage connected into the sewer, which can be assessed for removal.

Survey

As recommended, over 280m of CCTV surveys were completed in Winter 2024. The CCTV surveys were reviewed by an engineer and assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring remedial works. CCTV confirmed that no active infiltration was present within the sewer pipes but one manhole did have evidence of infiltration.

The network was also checked for inflows and no lateral connections are suspected of receiving flows not bound to receive.

Intervention

In February 2025, the manhole that showed evidence of infiltration was sealed via grout injection.

Next steps

Bolton Low Houses is currently in the monitoring stage of identifying and addressing infiltration (see Figure 1). The site will follow the iterative process displayed in Figure 1 to monitor the efficacy of the remedial works and identify new points of infiltration, should they arise.