Braithwaite

Infiltration Reduction Plan

Last Updated: October 2026



United Utilities

Water for the North West

Executive summary

Braithwaite in Cumbria is currently in the survey stage (see Figure 1) to address infiltration and reduce spills at the Braithwaite Pumping Station Storm Overflow. An initial desktop assessment concluded that groundwater infiltration was possible. CCTV surveys confirmed the presence of infiltration and interventions were completed in Spring 2025. A second phase of survey work is currently in progress.

As groundwater infiltration has been found but is yet to be confirmed as a leading cause of spills to environment, interventions have been completed to address the localised infiltration identified during the 2024 surveys. As more is known on the results of the interventions, this Infiltration Reduction Plan will be updated accordingly.

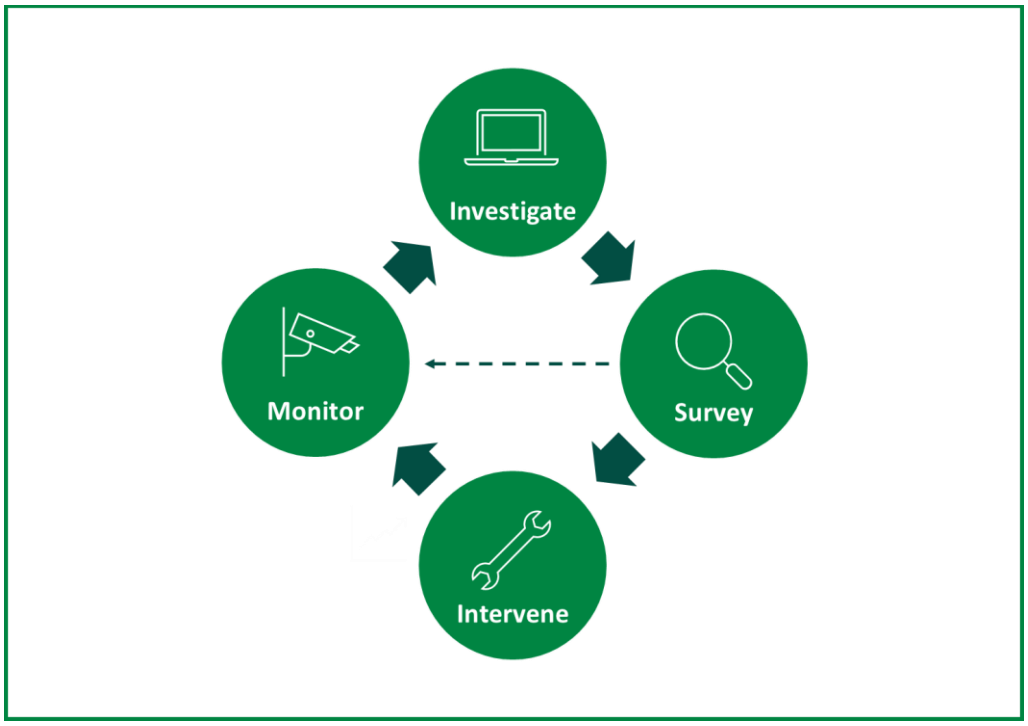


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water can enter our wastewater pipes, for which 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 show our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Braithwaite drainage area and its associated overflow, the Braithwaite Pumping Station Storm Overflow. Infiltration has been 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.

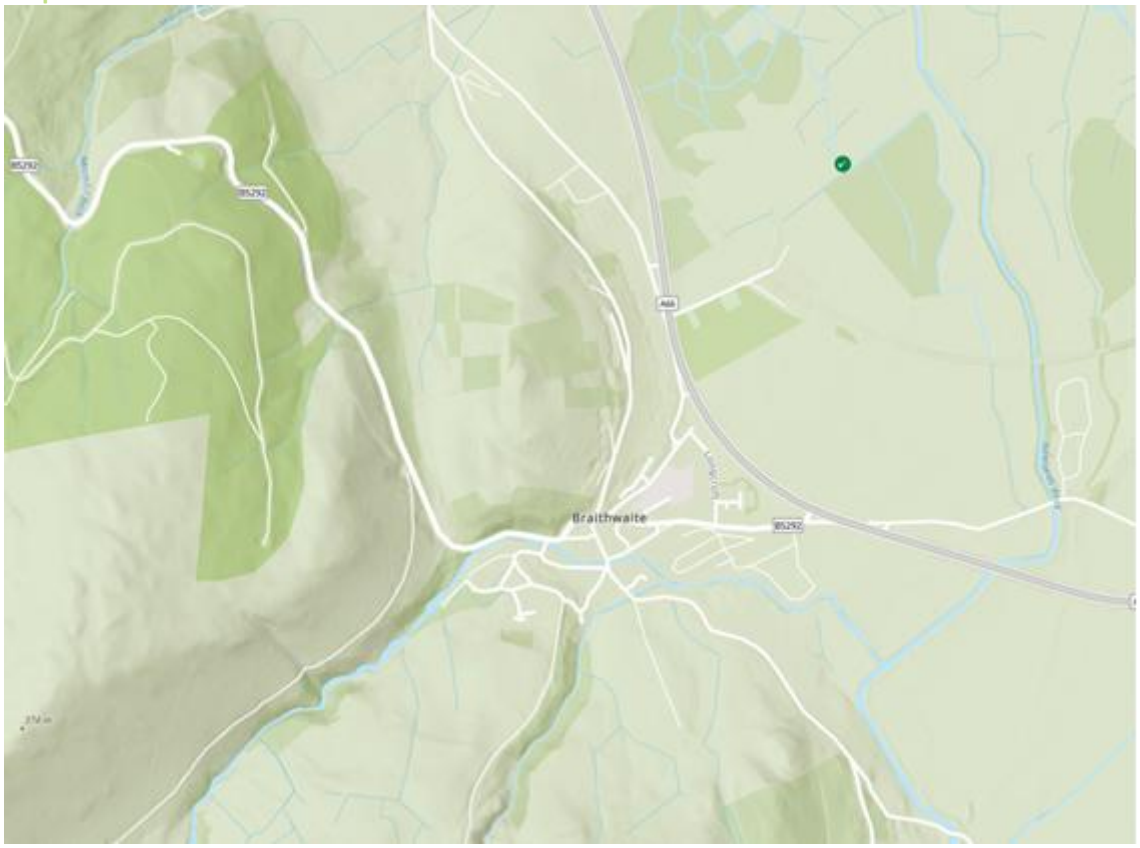


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the the Braithwaite Pumping Station Storm Overflow

Braithwaite lies around 2.5 miles from Keswick between Derwentwater and Bassenthwaite Lake. It is situated at the foot of Whinlatter Pass, sitting in a valley surrounded by hillsides.

Investigation

An initial 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 infiltration was possible in the catchment and most likely driven by slow response runoff. It also identified areas of the catchment where sewers crossed the local watercourse. Potential interactions of the watercourse with the sewer via highway gullies or defects could contribute to flows in the network.

From these findings, it was recommended that CCTV surveys be completed to identify any potential sources of infiltration. The CCTV surveys should also identify any land drainage connected into the sewer, which would be assessed for removal.

Survey

315m of CCTV surveys were completed in Autumn 2024. The CCTV surveys were assessed using Artificial Intelligence to rapidly identify and locate points of infiltration. The surveys were then reviewed by an engineer to assess for any required remedial works. A section of heavy infiltration was identified and suspected to be sourced from a nearby watercourse. Remedial works were recommended to seal the sewer network.

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

Further survey work is ongoing.

Intervention

As recommended, remedial works to address infiltration were completed in Spring 2025. This involved lining 19m of the sewer network to seal it and prevent infiltration.

Next steps

Braithwaite is currently in the survey stage of identifying and addressing infiltration (see Figure 1). If further infiltration is confirmed, additional remedial work will be undertaken. The site will then continue to follow the iterative process displayed in Figure 1 to identify any new points of infiltration, should they arise.