

**Braithwaite**

# **Infiltration Reduction Plan**

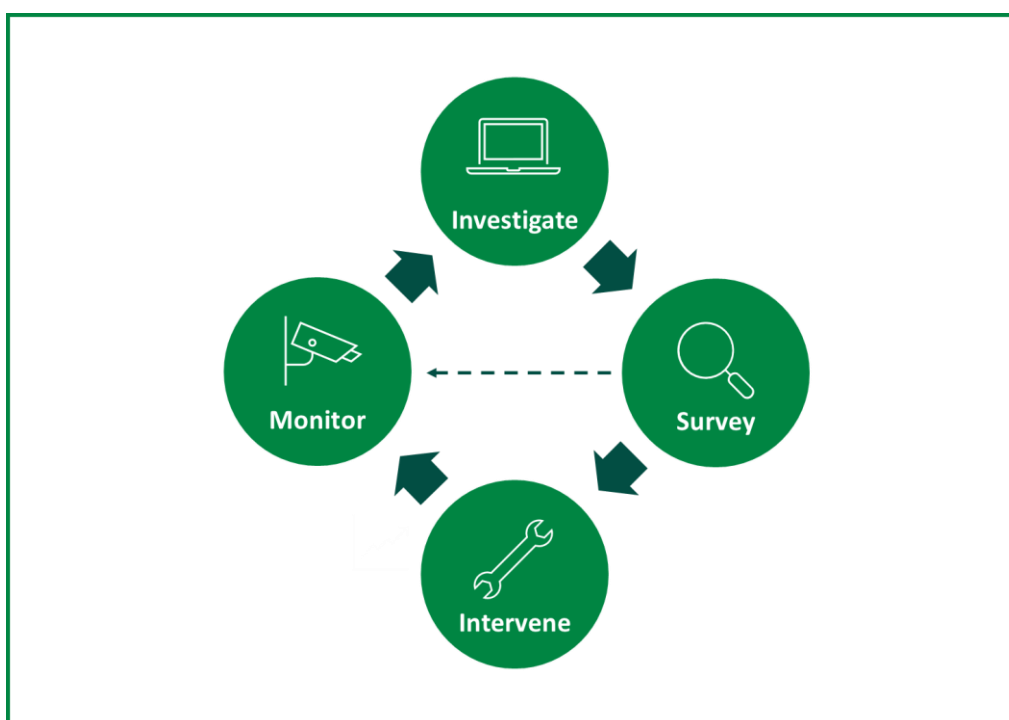
**Last Updated:** July 2025



## Executive summary

Braithwaite Pumping Station Storm Overflow in Cumbria is currently in the monitor stage (see Figure 1) to address infiltration and reduce spills at the Braithwaite Pumping Station Storm Overflow (ALL0056SO). A desktop assessment concluded that groundwater infiltration was possible, surveys have confirmed that infiltration is present and remedial works were completed in May 2025.

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 Winter 2024 surveys. As more is known on the results of the interventions, this Infiltration Reduction Plan will be updated accordingly.

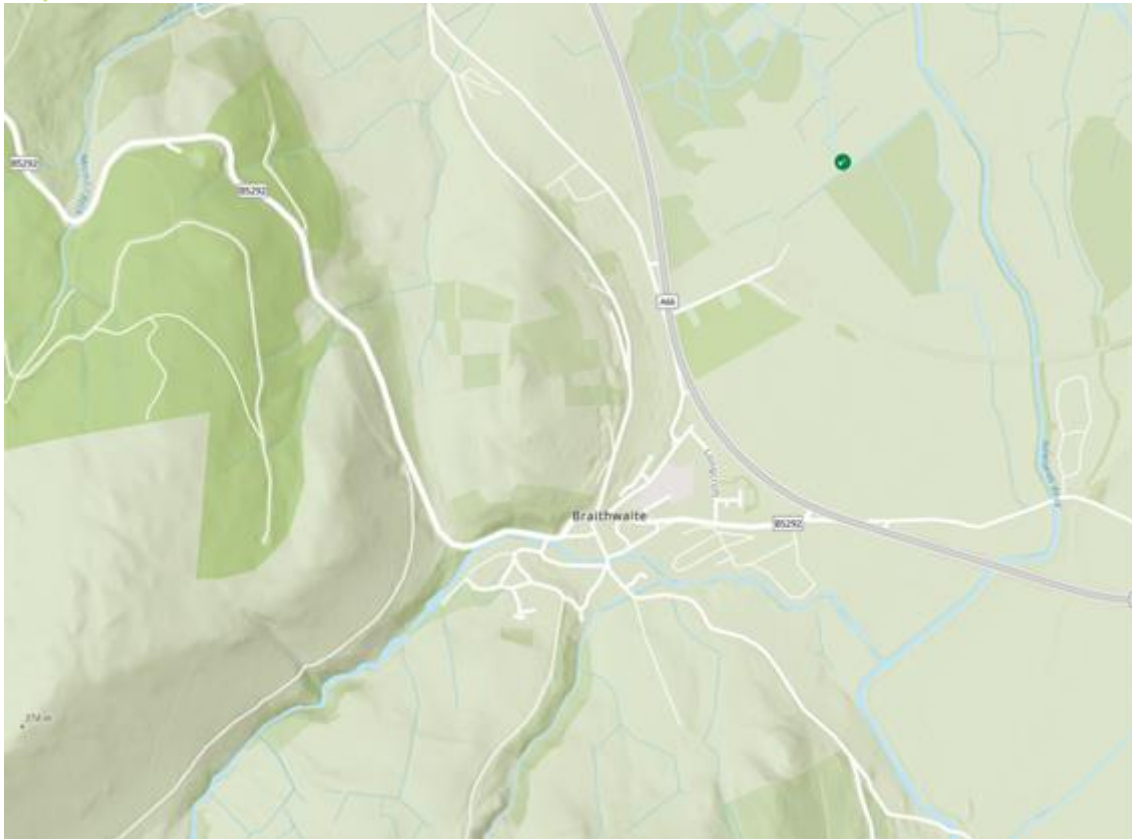


**Figure 1:** Iterative process to investigate, identify and address groundwater infiltration

## Context

Sometimes, water can enter our wastewater pipes 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 show our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Braithwaite drainage area and the associated overflow the Braithwaite Pumping Station Storm Overflow (ALL0056SO). 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 green dot marks the the Braithwaite Pumping Station Storm Overflow.

Braithwaite village in Cumbria 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.

## 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 infiltration was possible in the catchment and most likely driven by slow response run off. The assessment also identified areas of the catchment where public sewers cross the local watercourse. Potential interactions of the water course with the sewer via highway gullies or defects could contribute to flows in the network.

From these findings, it was recommended that CCTV surveys were completed to identify potential infiltration sources. CCTV surveys could also identify infiltration of the watercourse into the sewer or land drainage connected into the sewer, which can be removed.

## Survey

As recommended, we completed over 300m of CCTV surveys in Winter 2024 and identified infiltration. The CCTV surveys were reviewed by an engineer and assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring remedial works. A section of heavy infiltration was identified and suspected to be sourced from a nearby watercourse.

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

## Intervention

Remedial works to address infiltration were completed in May 2025. On the 18.7m sewer length where heavy infiltration was found, overlapped patches with silicon resin were installed to seal the network. Once the patches were cured, the line was then CCTV investigated to ensure there was no defect on the liner and no flow restrictions.

## Next steps

Braithwaite is currently in the monitor 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 remedial works completed in May 2025 and identify any more significant areas of infiltration, should they arise.