Cotehill

Infiltration Reduction Plan

Last Updated: January 2026

United Utilities

Water for the North West

Executive summary

Cotehill in Cumbria is currently in the monitoring stage (see Figure 1) to address infiltration and reduce spills at the Cotehill Wastewater Treatment Works Storm Tank Overflow (017670051ST). An initial desktop assessment concluded that there was a low likelihood of significant groundwater infiltration. CCTV surveys confirmed the presence of infiltration, and interventions to address this were completed in Spring 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 2024 surveys. As more is known on the results of the interventions, this Infiltration Reduction Plan will be updated accordingly.

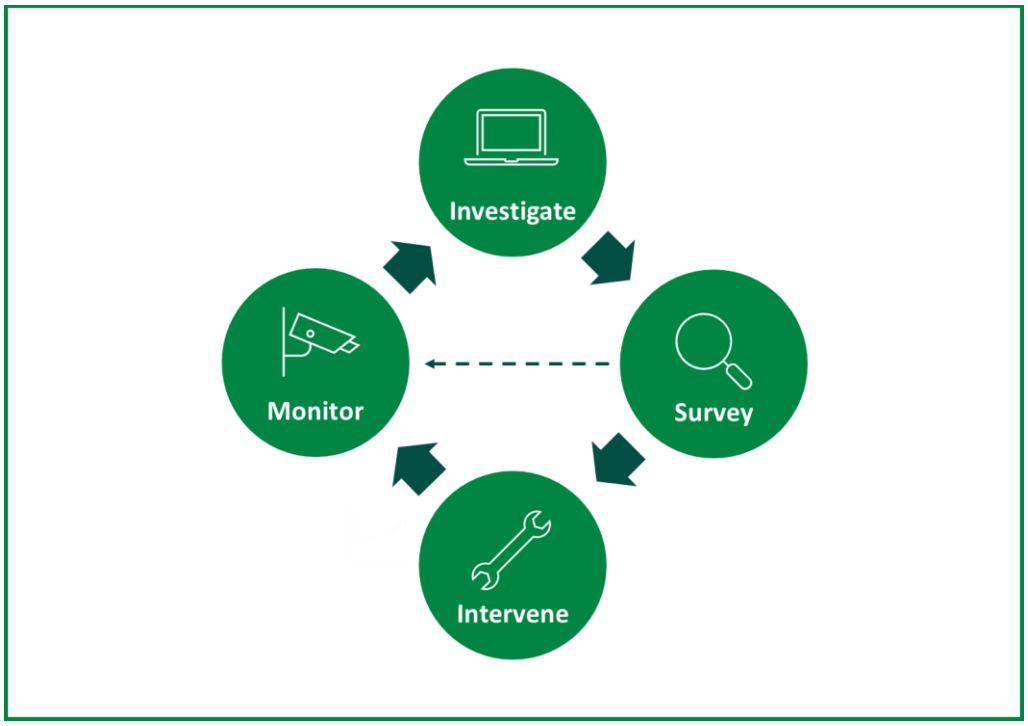

Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 demonstrate our efforts to date and next steps to address infiltration and inflows in the catchment. This plan covers the Cotehill drainage area and its associated overflow, Cotehill Wastewater Treatment Works Storm Tank Overflow (017670051ST). 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.

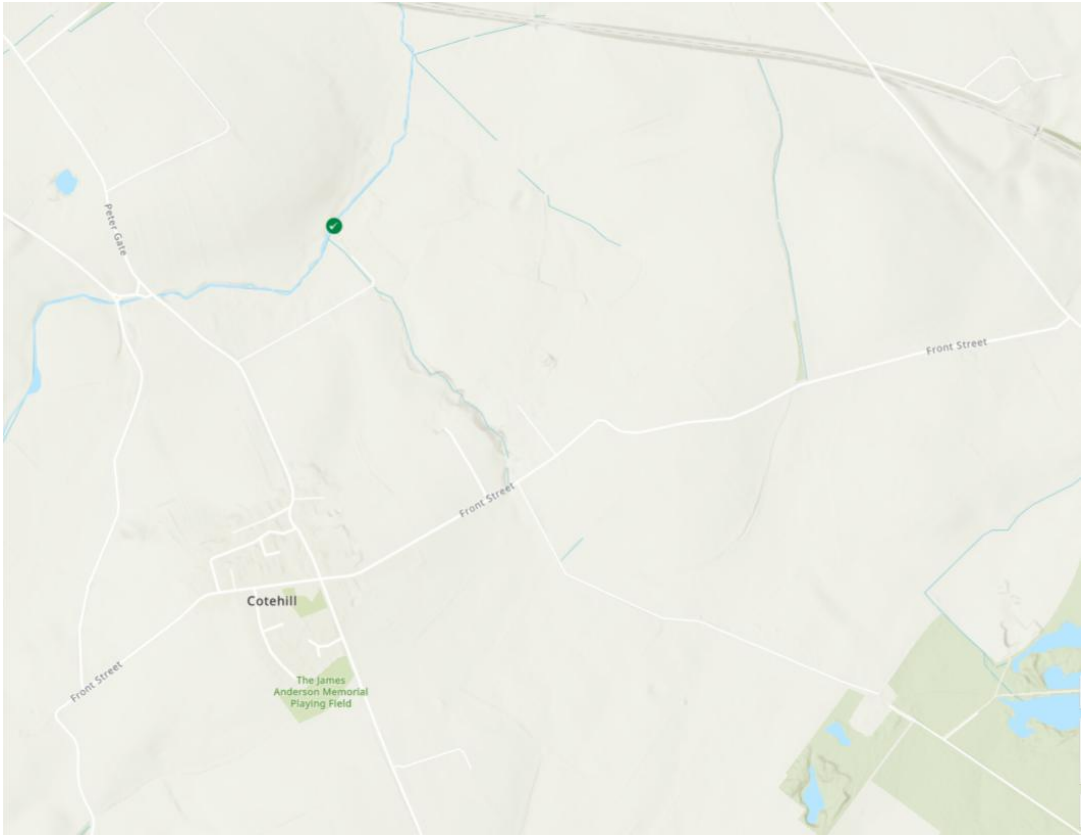

Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the Cotehill Wastewater Treatment Works Storm Tank Overflow

A village and parish in Cumbria, Cotehill lies south-east of Carlisle and south of Pow Maughan Beck, a tributary of the River Eden. The surrounding area features gently rolling hills and small wooded areas with primarily agricultural land use.

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 found indication of possible rainfall-driven infiltration, however, there was little evidence of baseflow that would be indicative of groundwater infiltration.

The assessment also identified areas of the catchment where watercourses either crossed or ran adjacent to sewers. It was noted that interactions with the watercourse could be a source of infiltration.

From these findings, it was recommended that CCTV surveys be completed to see if there was infiltration from the watercourse into the sewer. The CCTV survey should also identify if there is land drainage connected into the sewer, which would be assessed for removal.

Survey

694m of CCTV surveys were completed in Autumn 2024. The CCTV surveys were assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring interventions and reviewed by an engineer. Infiltration was confirmed at multiple points in the sewer network, with varying levels of severity.

Intervention

As recommended, remedial works were completed in Spring 2025. This involved lining 312m of the sewer network in order to seal it and prevent infiltration from all points identified during the 2024 surveys.

Next Steps

Cotehill is currently in the monitoring stage of identifying and addressing infiltration. The site will follow the iterative process displayed in Figure 1 to monitor the efficacy of the completed interventions and identify new points of infiltration, should they arise.