

Embleton

Infiltration Reduction Plan

Last Updated: January 2026



Executive summary

Embleton in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Embleton Wastewater Treatment Works Storm Tank Overflow (017570038ST). An initial desktop assessment concluded that groundwater infiltration is possible in the area, and that reducing infiltration could reduce spill frequency at the overflow. CCTV surveys identified some infiltration, and interventions are currently underway as a result.

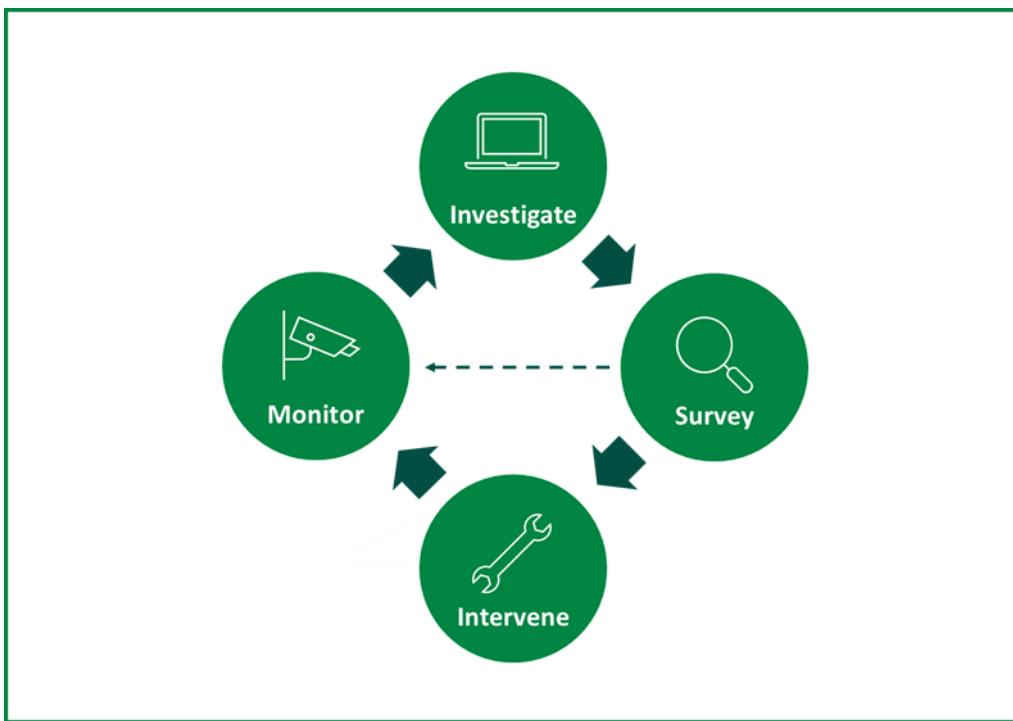


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Embleton drainage area and its associated overflow, Embleton Wastewater Treatment Works Storm Tank Overflow (017570038ST). In 2023, 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.

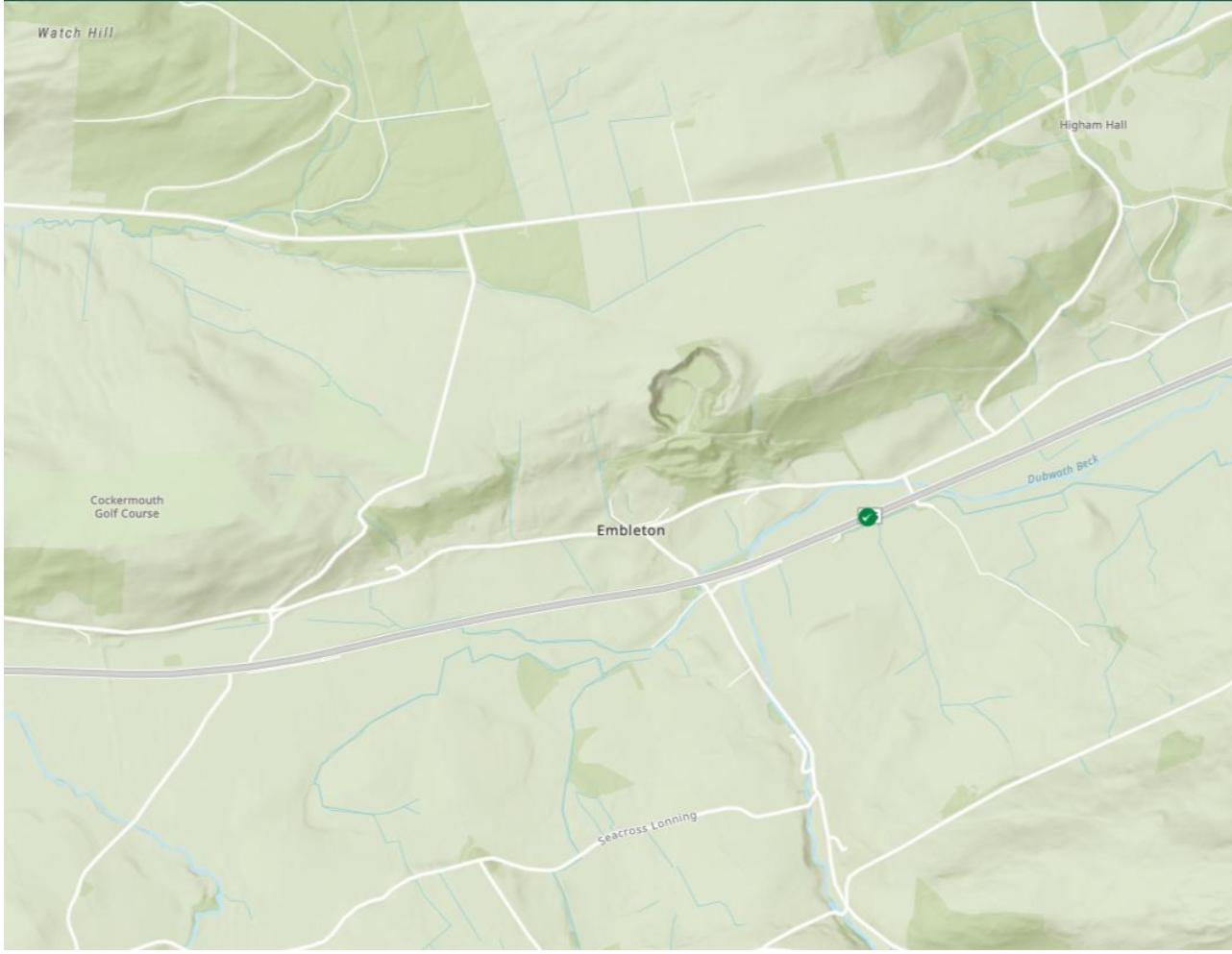


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the Embleton Wastewater Treatment Works Storm Tank Overflow.

Embleton is a small village located east of Cockermouth. It sits on the border of the Lake District National Park. South of the village, Wythop Beck runs into Dubwath Beck, which flows into Bassenthwaite Lake.

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 seasonal groundwater infiltration is possible in the catchment and rainfall-driven slow response runoff is likely. The contribution of groundwater infiltration to the modelled baseflow used in this assessment can only be determined following further investigations.

The identification of sewers running under or close to watercourses also suggested that further investigation would be required to identify any infiltration into the sewer network.

From these findings, it was recommended that CCTV surveys be completed to see if there was infiltration of 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

We completed 490m of CCTV surveys in Autumn/Winter 2024. The CCTV surveys were reviewed by an engineer and assessed using Artificial Intelligence to rapidly identify and locate points of infiltration requiring intervention. Infiltration was detected in a section of the network, and interventions were recommended as a result.

Intervention

As recommended, interventions are currently underway to address infiltration found in the network.

Next steps

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