

Embleton

Infiltration Reduction Plan

Last Updated: March 2025



Executive summary

Embleton in Cumbria is currently in the monitoring stage (see Figure 1) to address infiltration and reduce spills at the Embleton Wastewater Treatment Works Storm Tank Overflow (017570038ST). A desktop assessment concluded that groundwater infiltration is possible and therefore reducing infiltration in this area could be significant enough to reduce spill frequency at Embleton Wastewater Treatment Works Storm Tank Overflow. CCTV surveys did not identify groundwater infiltration and the area will now be monitored to identify new points of infiltration, should they arise.

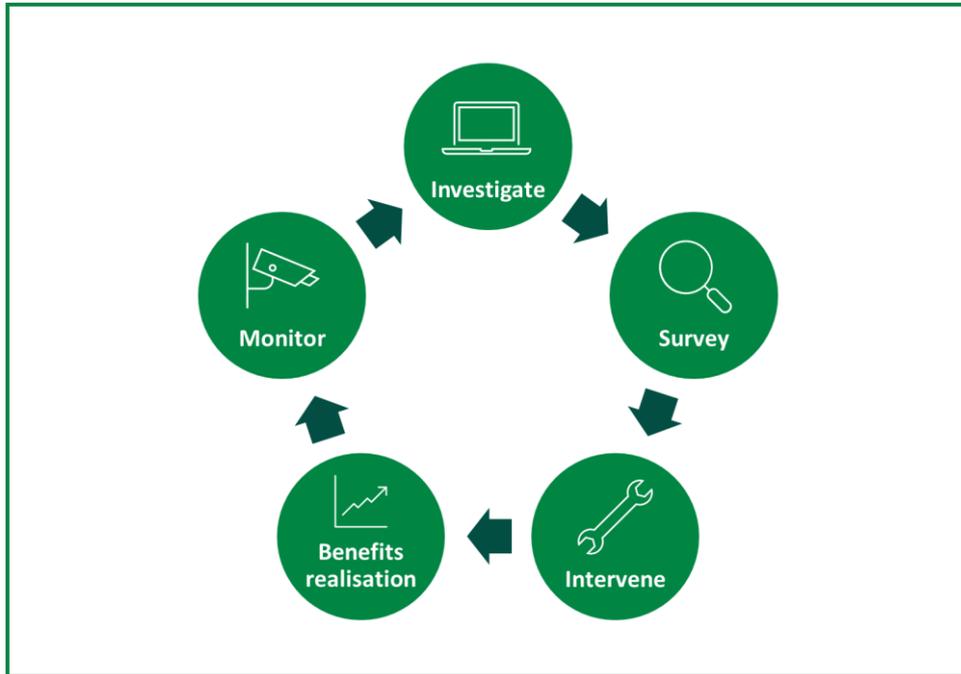


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Embleton drainage area and the 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.

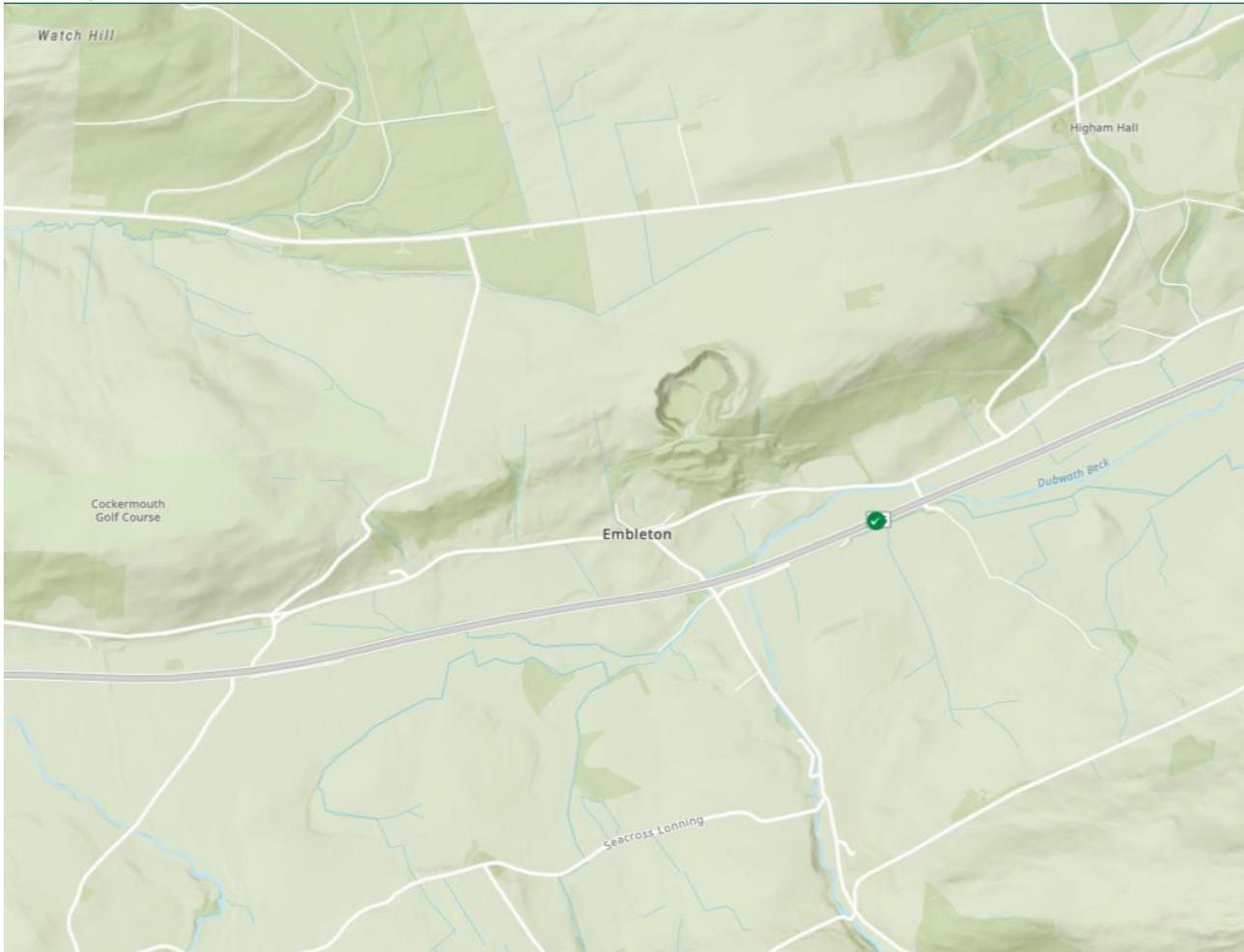


Figure 2: [United Utilities – Better Rivers – Storm Overflow Map \(September 2024\)](#). The green dot marks the Embleton Wastewater Treatment Works Storm Tank Overflow.

Embleton, Cumbria is a small village located 4km East of Cocker-mouth. 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 very slow response run off 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 suggest that further investigation is required to identify interference with the sewer network.

From these findings, it was recommended that CCTV surveys are completed to see if there is infiltration of the water course 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 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. In line with the desktop study, no active infiltration was found and therefore no remedial works required. There were lengths where encrustation is present which may be an indication of historic infiltration and therefore, resurveys may be completed to confirm that there is no infiltration when the water table is at its highest.

Next steps

Embleton will be resurveyed in winter 2025 and continue to be monitored to identify new points of infiltration, should they arise.