Skelton

Infiltration Reduction Plan

Last Updated: October 2026



United Utilities

Water for the North West

Executive summary

Skelton in Cumbria is currently in the monitoring stage of our plan to identify and address infiltration and reduce spills at the Skelton Wastewater Treatment Works Storm Overflow (see Figure 1). An initial desktop assessment concluded that there was a low likelihood of groundwater infiltration. However, surveys confirmed the presence of infiltration and remedial works 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 assessed and completed to address the localised infiltration which was identified at the survey stage.

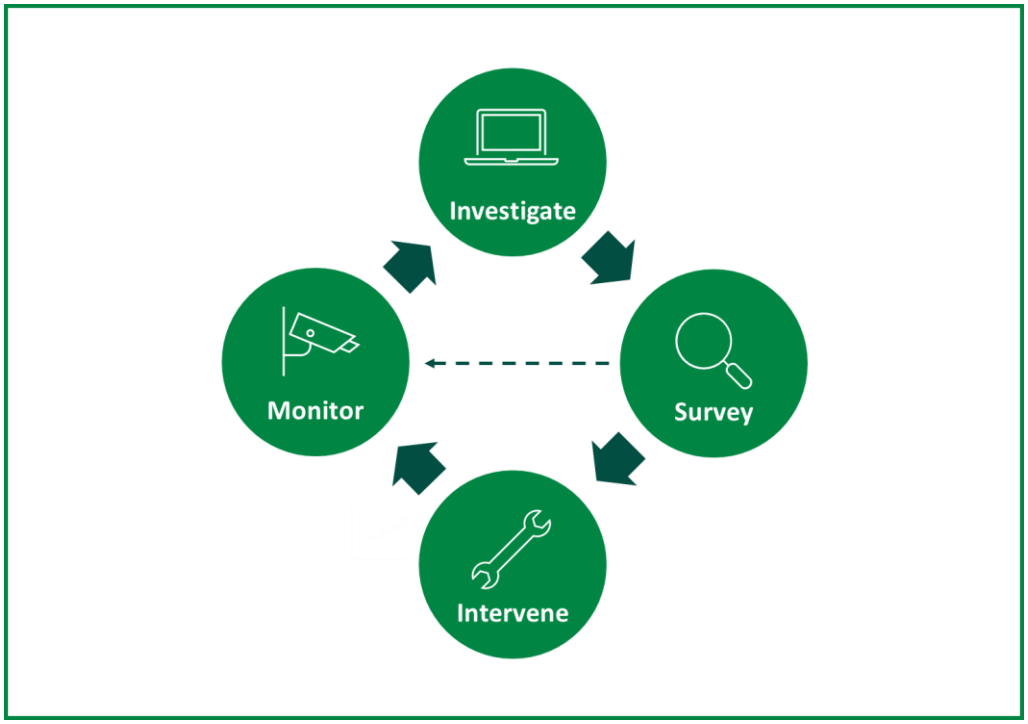


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Skelton drainage area and its associated overflow, Skelton Wastewater Treatment Works 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.

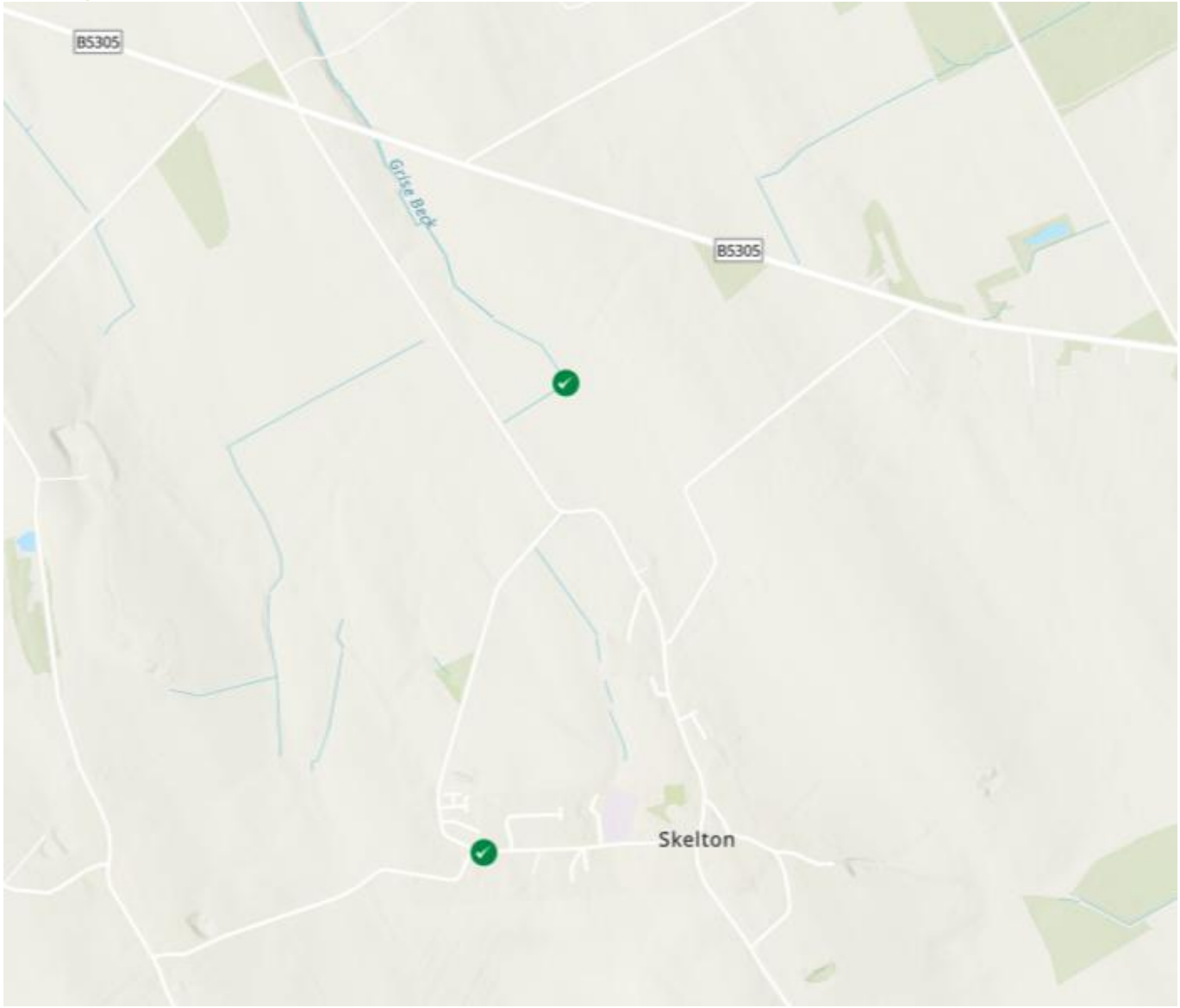


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (October 2024). The northern green dot marks the Skelton Wastewater Treatment Works Storm Overflow

Skelton is a small village and civil parish that lies around 6km outside the Lake District National Park Boundary, north-west of Penrith near Grise Beck.

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 significant infiltration was unlikely in the catchment. However, it did identify an area of the catchment where a watercourse ran adjacent to public sewers. It was noted that that flow from the watercourse could enter the sewer system through pipe defects, leaky joints, or issues with manholes.

From these findings, CCTV surveys were recommended to identify if there was infiltration from the watercourse into the sewer network. The CCTV surveys could also identify if there was land drainage connected into the sewer, which would be assessed for removal.

Survey

503 metres of CCTV surveys were completed in autumn 2024. The survey footage was initially analysed using artificial intelligence (AI) to help quickly identify potential sources of groundwater entering the sewer network. The results were then reviewed by an engineer, who confirmed several locations where groundwater was entering the sewer system and recommended remedial works to address these issues.

The network was also checked for any unexpected inflows, and no lateral connections were identified as receiving water they were not intended to receive.

Intervention

As recommended, remedial works to address infiltration were completed in spring 2025. This involved lining 107 metres of sewers to seal the network and prevent infiltration. All points of infiltration identified in the 2024 surveys have been sealed.

Next steps

Skelton is currently in the monitoring stage of our plan to identify and address infiltration (see Figure 1). We will continue to monitor the network to assess the effectiveness of the completed interventions and identify any new sources of infiltration should they arise.