## Kirkbampton

# Infiltration Reduction Plan

**Last Updated:** October 2026



United Utilities

Water for the North West

# Executive summary

Kirkbampton in Cumbria is currently in the survey stage of this Infiltration Reduction Plan (see Figure 1), which aims to address infiltration and reduce spills at the Kirkbampton Wastewater Treatment Works Overflow and Storm Tank Overflow.

An initial desktop assessment concluded that groundwater infiltration was likely. The first phase of CCTV surveys confirmed infiltration, and remedial interventions were completed in spring 2026.

A second phase of surveys was undertaken between spring/summer 2026 and autumn/winter 2026 to assess whether any remaining infiltration was present within the network. The findings are currently being reviewed by our engineer and, where further remedial work is required, it is anticipated to be undertaken between winter 2026 and summer 2027.

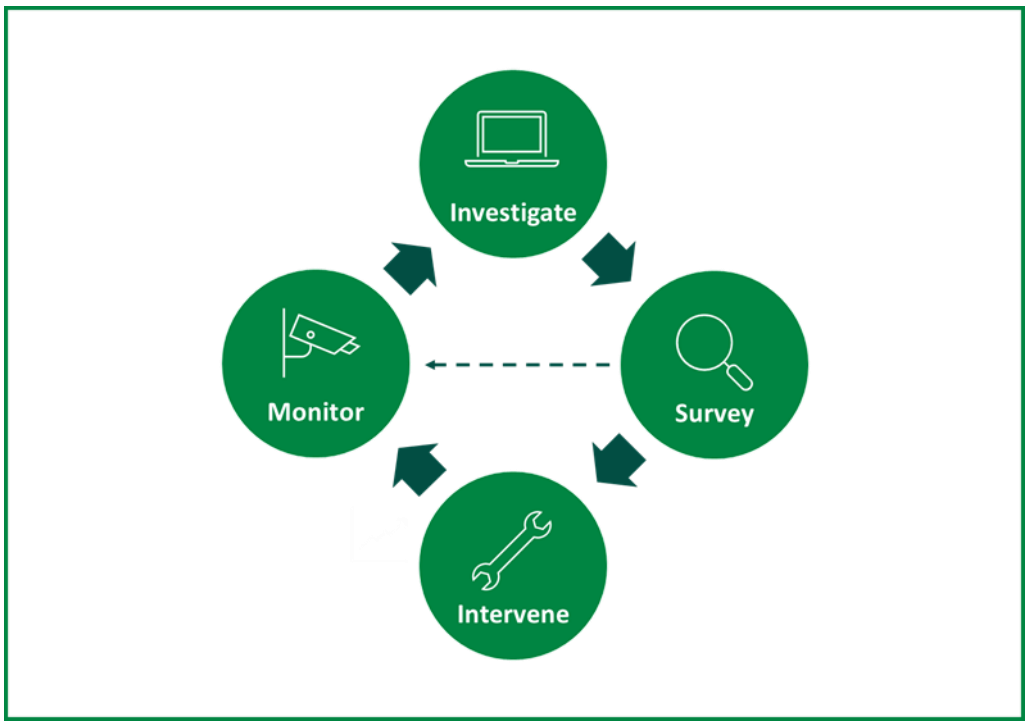



**Figure 1:** Iterative process to investigate, identify and address groundwater infiltration

# 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 Kirkbampton drainage area and its associated overflows, Kirkbampton Wastewater Treatment Works Overflow & Storm Tank Overflow. In 2022, infiltration was identified as a potential leading cause of the storm overflows discharging. The purpose of this plan is to capture the process to investigate, identify and address significant groundwater infiltration.

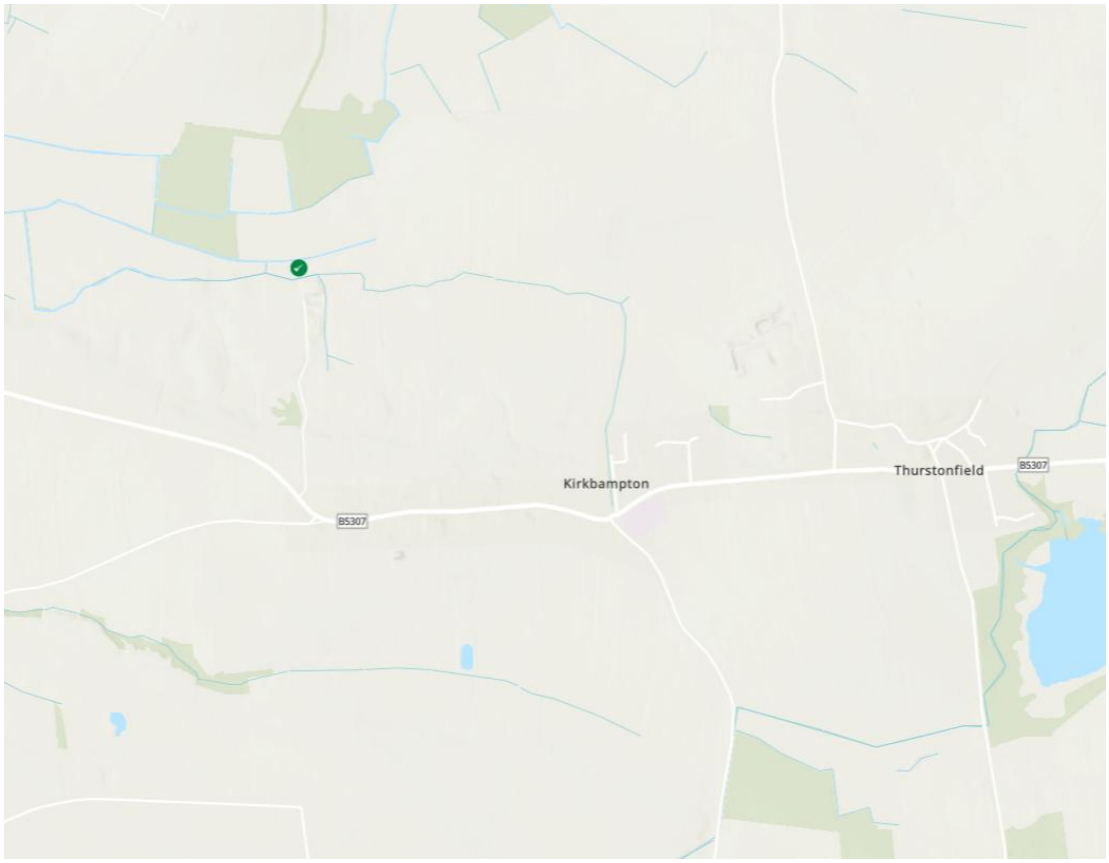



**Figure 2:** United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the Kirkbampton Wastewater Treatment Works Storm Tank Overflow

Kirkbampton in Cumbria sits six miles west of Carlisle and is surrounded by farmland and scenic countryside. The village has a relatively flat landscape considering its proximity to more undulating hills towards the Lake District National Park to the south and the coastal marshes and plains to the north.

## 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 groundwater infiltration was likely in the catchment. Monitoring at the storm tank evidenced seasonal changes indicative of groundwater infiltration. The assessment also noted areas of the catchment where sewers crossed watercourses. It can be that flow

from the watercourses enters the sewer system via defects in the sewer network or when there is a rise in groundwater levels.

From these findings, it was recommended that CCTV surveys be completed to see if there was infiltration of the watercourses into the sewer network. CCTV surveys could also identify if there was land drainage connected into the sewer, which would be assessed for removal.

## Survey

A total of 2,841 metres of CCTV survey work was completed between winter 2024 and autumn 2025. The survey footage was initially assessed using artificial intelligence (AI) to rapidly identify and locate potential points of infiltration. The results were subsequently reviewed by an engineer to confirm findings and determine any required remedial works.

The surveys identified multiple locations where groundwater infiltration was entering the sewer network, and remedial interventions were recommended. The network was also assessed for inflows, with several potential inflow sources identified and currently undergoing further investigation.

A second phase of CCTV survey work, comprising 2,842 metres, was undertaken between spring/summer and autumn/winter 2026 to assess whether any further infiltration remains within the network following the initial interventions. The survey findings are currently being reviewed by an engineer and, where further remedial work is required, it is anticipated to be undertaken between winter 2026 and summer 2027.

## Intervention

As recommended, remedial interventions to address infiltration were completed in spring 2026. This included lining approximately 1,516 metres of the sewer network and sealing 15 manhole chambers to prevent groundwater infiltration.

An engineer is currently reviewing the findings from the second phase of survey work. Any additional remedial work identified from the recent CCTV surveys will be planned for delivery between winter 2026 and summer 2027.

## Next steps

Kirkbampton is currently at the survey stage of our infiltration reduction process (Figure 1). The findings from the latest CCTV surveys are being reviewed, and any further remedial work identified is anticipated to be undertaken between winter 2026 and summer 2027. Following completion of these works, we will continue to monitor the network to assess the benefits achieved and identify any new sources of groundwater entering the sewer system.