

Orton

Infiltration Reduction Plan

Last Updated: September 2026



Executive summary

Orton in Cumbria is currently in the monitoring stage (see Figure 1) to address infiltration and reduce spills at Orton Wastewater Treatment Works Storm Tank and Overflow. An initial desktop assessment concluded that significant groundwater infiltration in the area was unlikely, however, CCTV surveys have confirmed infiltration. Remedial works were completed in Spring/Summer 2025.

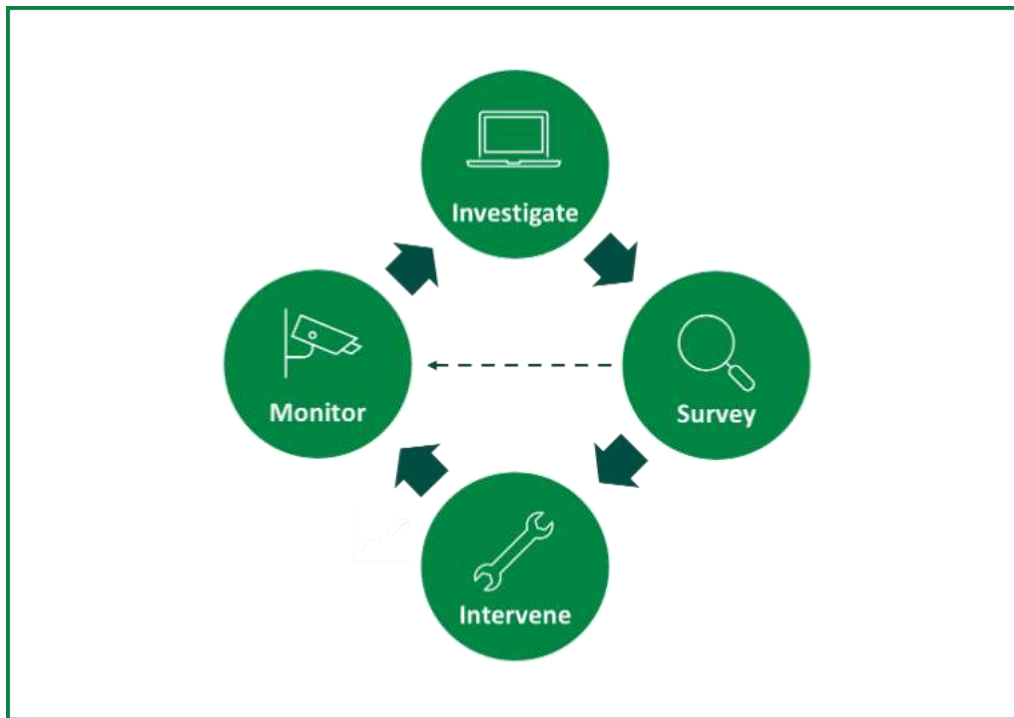


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Orton drainage area and its associated overflow, Orton Wastewater Treatment Works Storm Tank Overflow. In 2022, 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.

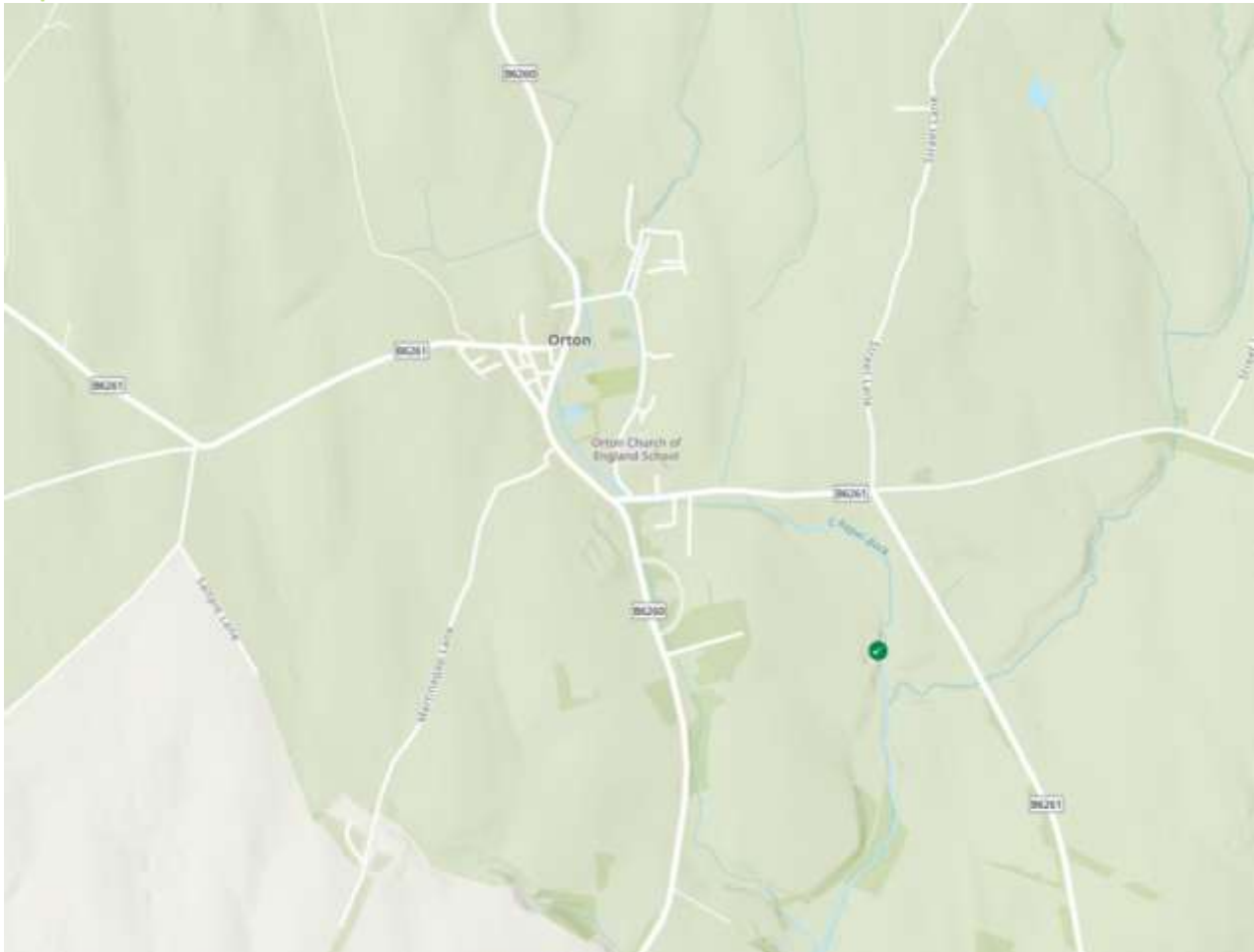


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (September 2024). The green dot marks the Orton Waste Water Treatment Works Storm Overflow

A market village in Cumbria, Orton lies 15 miles south of Penrith in a relatively flat landscape. Chapel Beck, a tributary of the River Lune, flows through the village.

Investigate

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 unlikely in the catchment as there was little evidence of baseflow in the system. However, further observations identified several areas of the catchment where sewers crossed or ran parallel to local rivers. It can be that flow from watercourses can enter the sewer system via pipe defects.

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

Survey

As recommended, 317m of CCTV surveys were completed in Winter 2024. The surveys were assessed using Artificial Intelligence to rapidly identify and locate points of infiltration. They were then reviewed by an engineer to identify any required remedial works. Infiltration was found, and remedial works were recommended as a result.

The network was also checked for inflows, and no lateral connections are suspected of receiving flows not bound to receive.

Interventions

Remedial works to address infiltration were completed in Spring/Summer 2025. Remedial works at Orton included relining 50m of the sewer network to seal it from infiltration and replacing A manhole cover and frame.

Next steps

Orton is currently in the monitoring stage of identifying and addressing infiltration. As groundwater infiltration has been found but is yet to be confirmed as the leading cause of spills to the environment, interventions have been completed to address the localised infiltration identified during surveys. As more is known on the outcome of the interventions, this Infiltration Reduction Plan will be updated accordingly.