Gleaston

Infiltration Reduction Plan

Last Updated: November 2025

United Utilities

Water for the North West

Executive summary

The Gleaston Castle area in Cumbria is currently in the monitor stage (see Figure 1) to address infiltration and reduce spills at the Gleaston Castle CSO (Combined Sewer Overflow) Storm Overflow (LAK0053SO, also known as Scales CSO). A desktop assessment concluded that flows are influenced by seasonal high groundwater levels, indicative of groundwater infiltration and CCTV surveys confirmed the presence of infiltration. Interventions to address this were completed in Summer 2025.

As groundwater infiltration has been found but is yet to be confirmed as a leading cause of spills to environment, interventions have been completed to address the localised infiltration identified during the Winter 2024 surveys. As more is known on the results of the interventions, this Infiltration Reduction Plan will be updated accordingly.

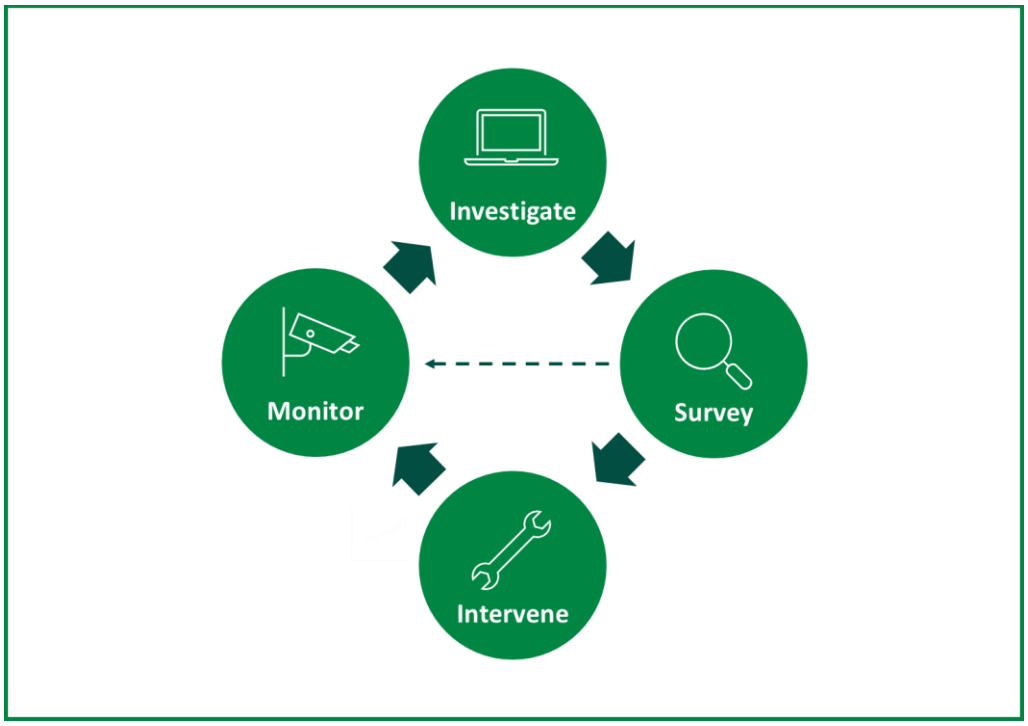

Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water that our wastewater pipes are not designed to receive can enter the pipes. 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 Gleaston Castle drainage area and the associated overflow, Gleaston Castle CSO (Combined Sewer Overflow) Storm Overflow (LAK0053SO). In 2023, infiltration was identified as a potential leading cause of the storm overflow discharging. The purpose of this plan is to further investigate and address this. The purpose of this plan is to capture the process to investigate, identify and address significant groundwater infiltration.

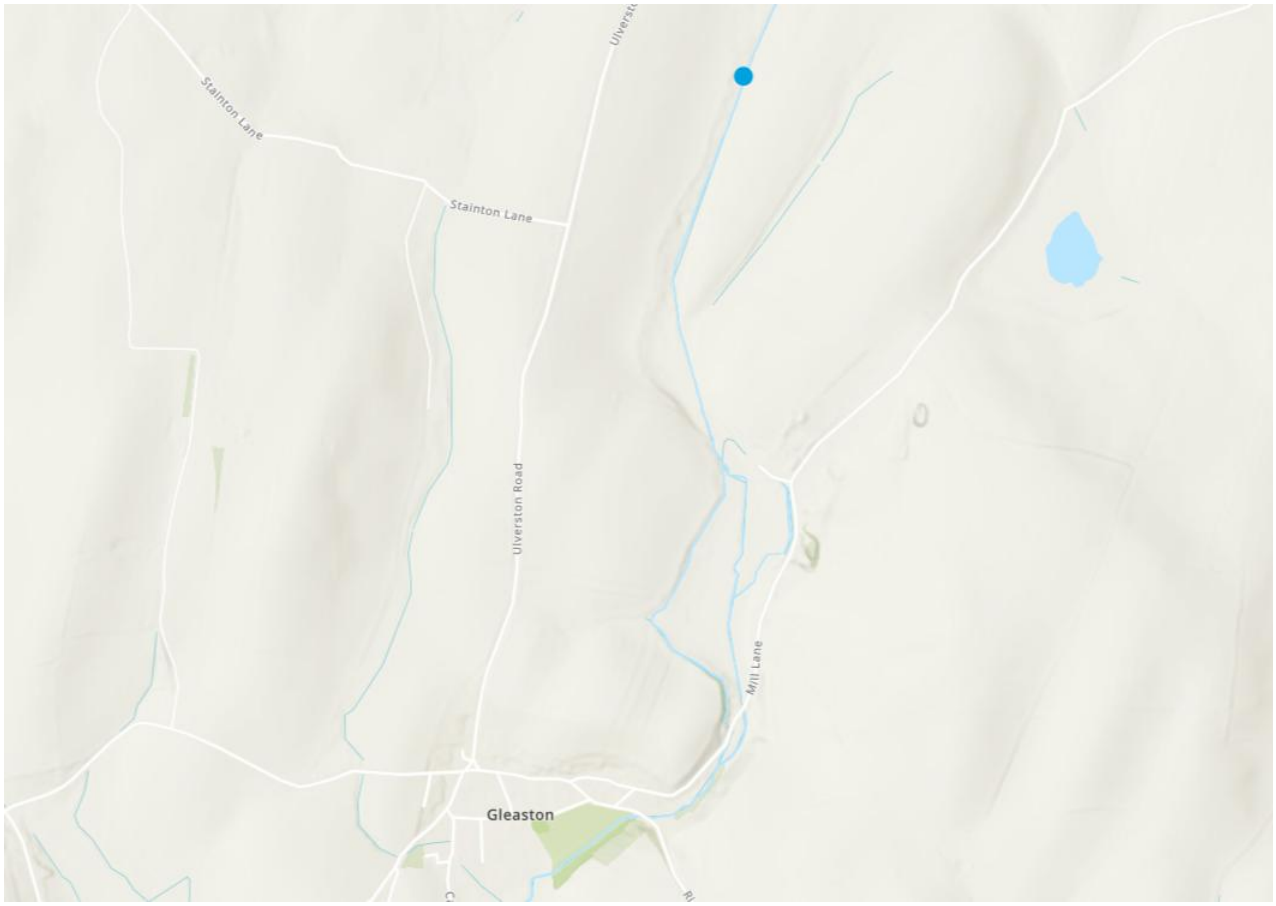

Figure 2: United Utilities – Better Rivers – Storm Overflow Map (December 2024). The blue dot marks the Gleaston Castle CSO Storm Overflow.

Gleaston is a village in Furness, Cumbria. It is 2km from Newbiggin beach. Gleaston Beck flows through the village into Deep Meadows Beck to the South.

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 significant groundwater infiltration was possible in the catchment as MCERTS and monitoring device data indicate high winter groundwater levels that are likely influencing flows. Further observations also identified areas where sewers are close to, and cross, local watercourses. Structural defects or connectivity between the watercourse and the sewers could be causes of infiltration.

The contribution of groundwater infiltration to spill frequency in the area can only be determined after further investigations. 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

Comprehensive CCTV surveying of the area has been completed. Two lengths of sewer and one manhole were shown to be suffering with severe infiltration in an area with a high water table.

Intervention

Remedial works to address infiltration were completed in Spring/Summer 2025 and included relaying over 100m of the sewer network and replacing 1 manhole. The new lengths of sewer were laid in a material which will prevent further infiltration at this point, and in addition to these lengths of sewer, the new manhole was concrete encased to add further protection against ground water in the area.

Next steps

Gleaston continues to be in the monitoring stage of identifying and addressing infiltration (see Figure 1). The site will follow the iterative process shown in Figure 1 and monitor the site over the wetter winter months, in order to check the efficacy of the remedial works mentioned above, and to identify new points of infiltration, should they arise. The number of spills will be reviewed again in Spring 2026 to check for improvement from this year.