Grange

Infiltration Reduction Plan

Last Updated: December 2025

United Utilities

Water for the North West

Executive summary

Grange in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Grange Pumping Station Storm Overflow (LAK0074SO). An initial desktop assessment concluded that there was a possibility of groundwater infiltration but there is not likely to be a significant amount that would reduce spill count if addressed. CCTV surveys confirmed the presence of infiltration, and further interventions to address this are underway, due to be completed in Winter 2026.

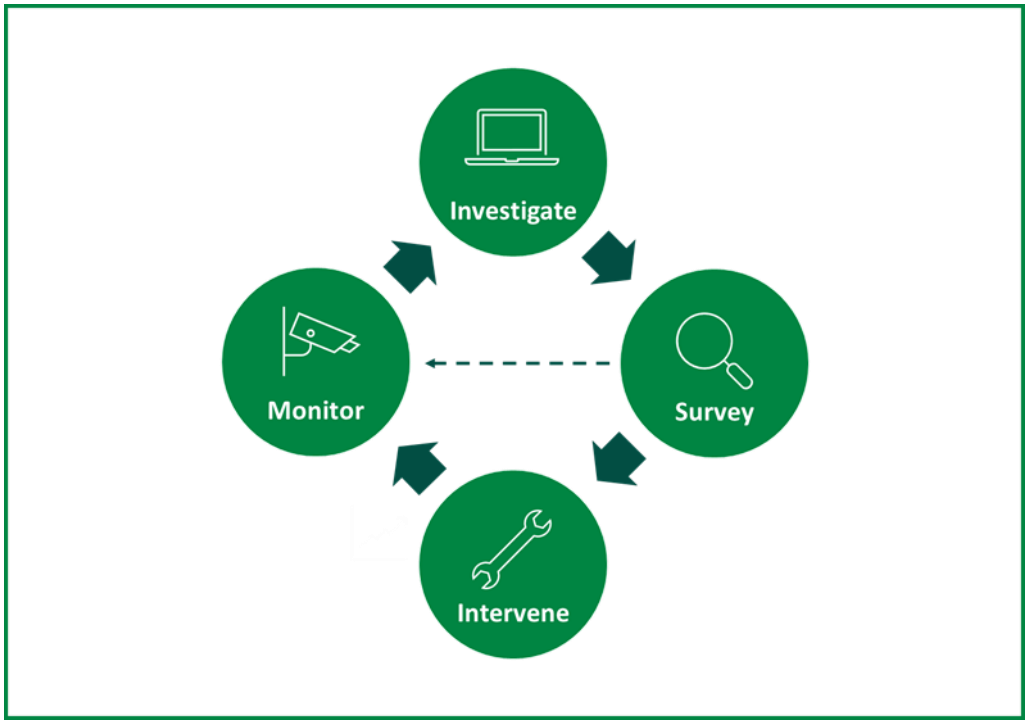

Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Grange Pumping Station drainage area and its associated overflow, Grange Pumping Station Storm Overflow (LAK0074SO). 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.

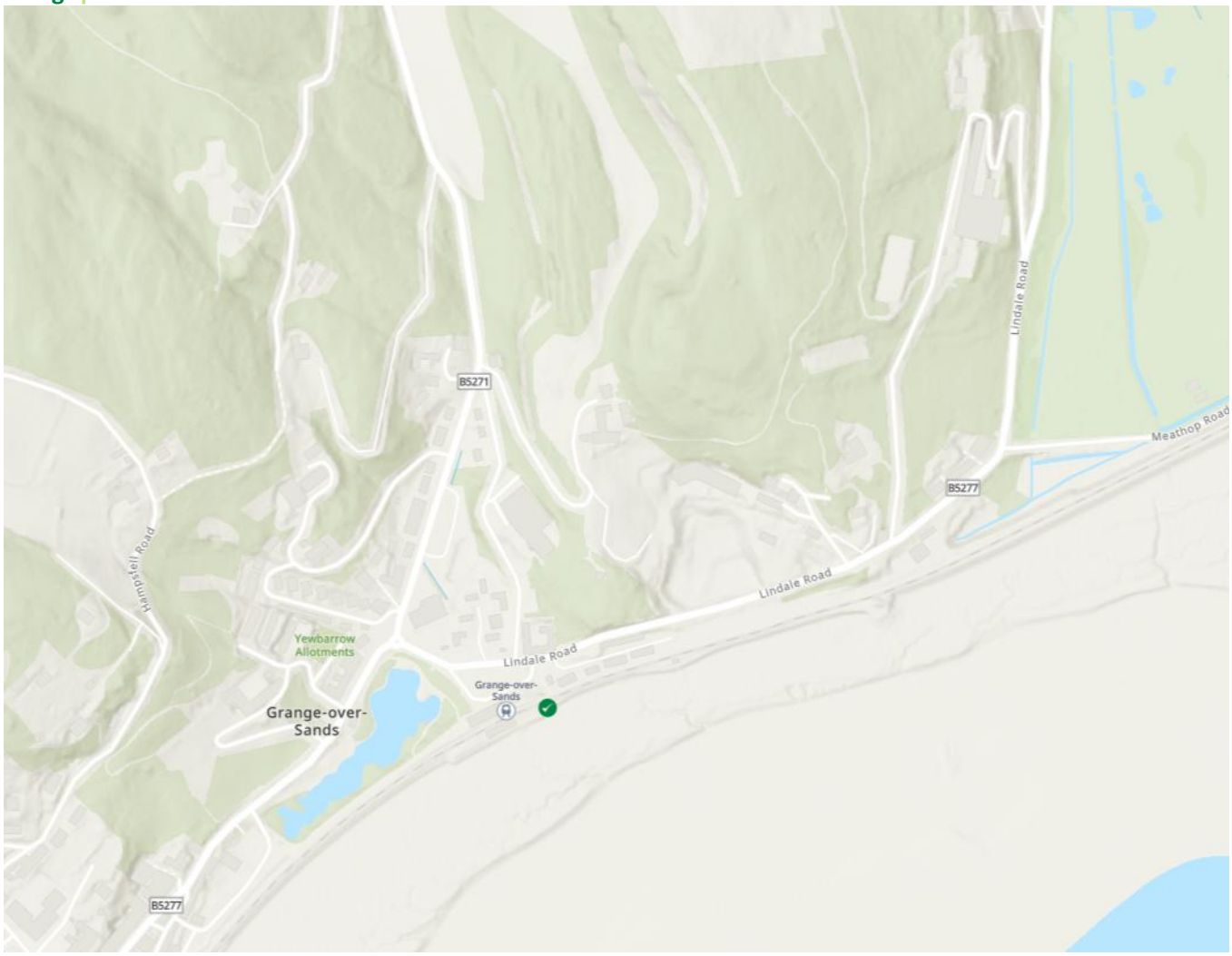

Figure 2: United Utilities – Better Rivers – Storm Overflow Map (November 2024). The green dot marks the Grange Pumping Station Storm Overflow

Grange-over-Sands lies on the northern stretch of Morecambe Bay in Cumbria. It lies just outside of the southern Lake District National Park border and is surrounded by coastal and upland area. The mixture of woodland, farmland, hills, urban areas, and the estuary creates a unique catchment landscape.

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 unlikely in the catchment. Some evidence of base infiltration in the system was identified: rainfall-driven runoff, and areas of the

catchment where water bodies run next to sewers and highways where public sewers are located. It is possible for flow to enter the system through highway gullies, therefore, further investigation was recommended.

From these findings, it was recommended that CCTV surveys be completed to see if there is infiltration 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

As recommended, 580m of CCTV surveys were completed 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. Multiple points of linear infiltration were identified. This confirmed the need for an intervention to seal the network.

Checks were also carried out on all lateral connections; none are suspected of receiving flows not bound to receive.

Intervention

Remedial works are currently in progress and due to be completed in Winter 2026. To date, 86m of the sewer network has been lined in order to prevent infiltration.

Next steps

Grange is currently in the intervention stage of identifying and addressing infiltration. The site will then follow the iterative process displayed in Figure 1 to monitor the efficacy of these remedial works and identify new points of infiltration, should they arise.