

Torpenhow

Infiltration Reduction Plan

Last Updated: March 2025



Executive summary

Torpenhow in Cumbria is currently in the intervention stage (see Figure 1) to address infiltration and reduce spills at the Torpenhow Wastewater Treatment Works Storm Overflow (017570075SO). A desktop assessment concluded that there is the possibility of groundwater infiltration but not likely a significant amount that would reduce spill count if addressed. Surveys have confirmed that no interventions are required, and the site will be monitored.

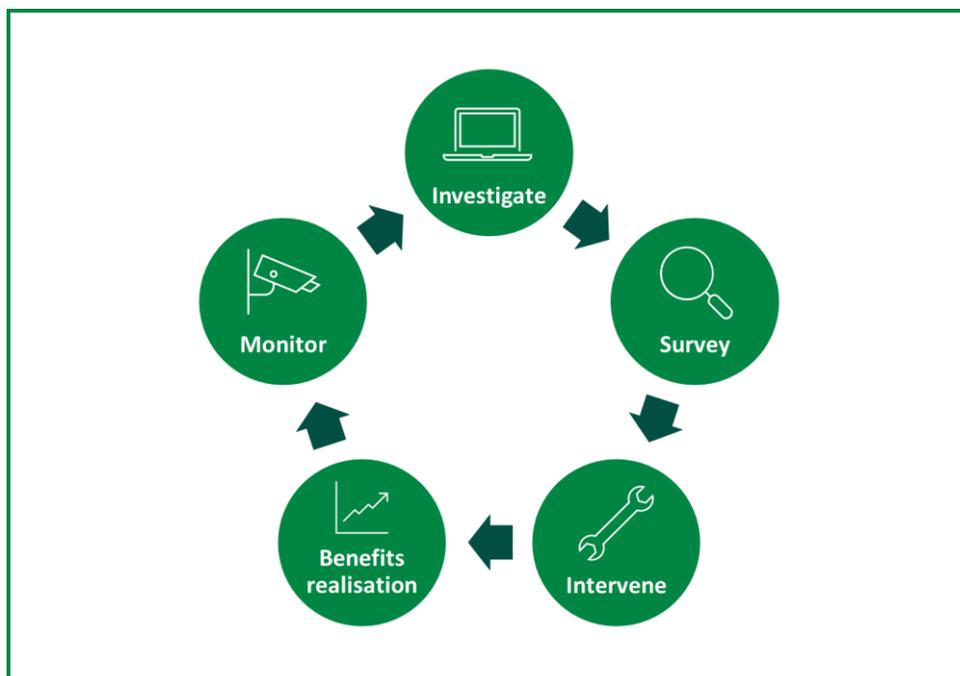


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

Context

Sometimes, water can enter our wastewater pipes that 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 Torpenhow drainage area and the associated overflow, Torpenhow Wastewater Treatment Works Storm Overflow (017570075SO). In 2022, 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. If groundwater infiltration is found to be a leading cause of spills, interventions will be assessed, and this Infiltration Reduction Plan will be updated accordingly. If not, this plan will end at the survey stage and next steps will be processed through other relevant workstreams.

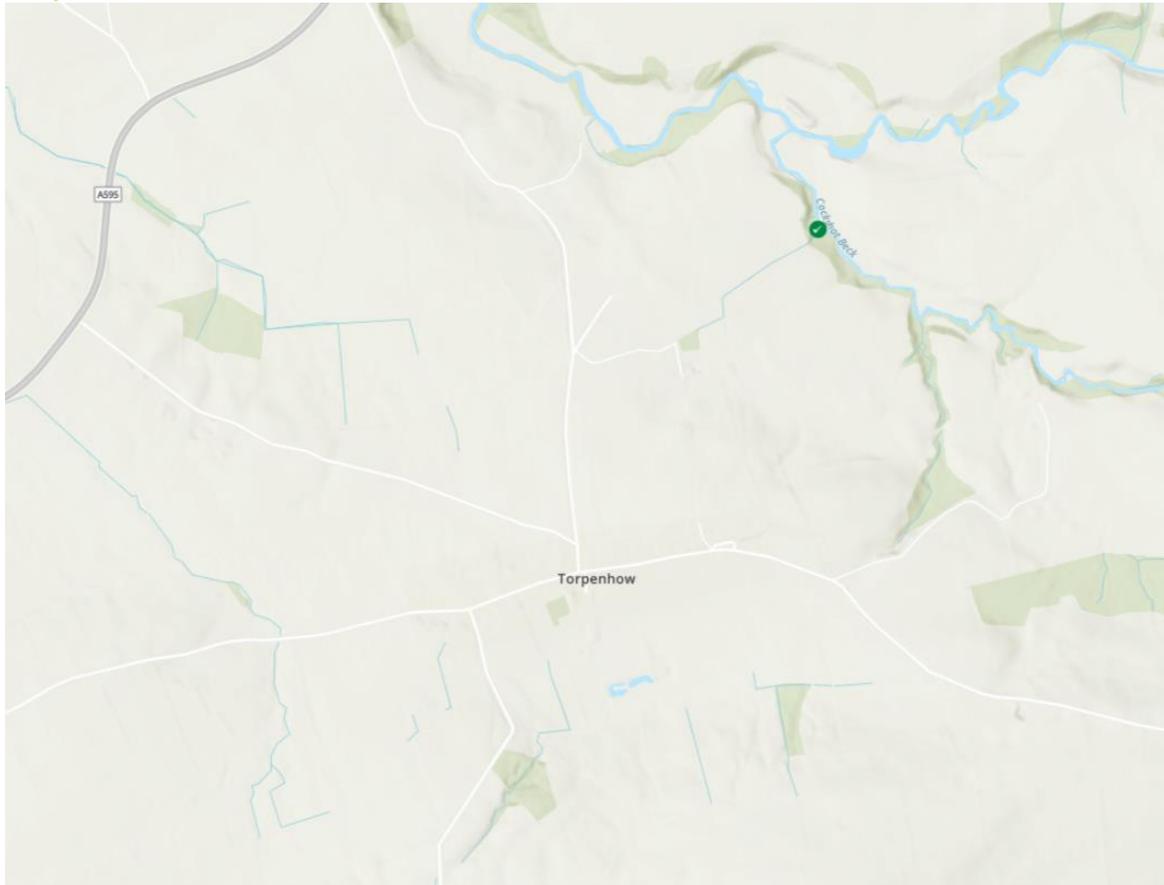


Figure 2: United Utilities – Better Rivers – Storm Overflow Map (November 2024). The green dot marks the Torpenhow Wastewater Treatment Works Storm Overflow.

Torpenhow village sits 2km North of the Lake District National Park, 3km south east of Blennerhasset. The River Ellen and its tributary Cockshot Beck are the nearest watercourses and where the storm overflow is located. The catchment consists of gently sloping hills, surrounding valleys and farmland. Its proximity to the Lake District fells contributes to its varied 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 however, indicators of some rainfall driven run off and possible groundwater infiltration warrant surveys to clarify this. However, there were several indicators that suggest that surveys are required to clarify whether infiltration is present, including the identification of a sewer crossing underneath a stream. Recent CCTV

surveys in the area for other works have also identified structural defects in the sewer network that could be facilitating groundwater infiltration.

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

Survey

Despite the desktop assessment determining groundwater infiltration as unlikely, to confirm this, 535m of CCTV sewer surveys were completed in Winter 2024. The CCTV surveys were assessed using Artificial Intelligence and reviewed by an engineer to identify points of infiltration. It was determined that, as no infiltration or evidence of previous infiltration were identified, no further interventions are required in the areas surveyed.

Next steps

Torpenhow will remain in the monitoring stage of identifying and addressing infiltration (see Figure 1) to identify emerging points of infiltration, should they arise.