

**Torpenhow**

# **Infiltration Reduction Plan**

**Last Updated: November 2024**



## Executive summary

Torpenhow in Cumbria is currently in the survey 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 are underway to clarify this as well as the exploration of Natural Flood Management to manage rural run off if this is found to be a significant contributing factor in spill numbers.

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.

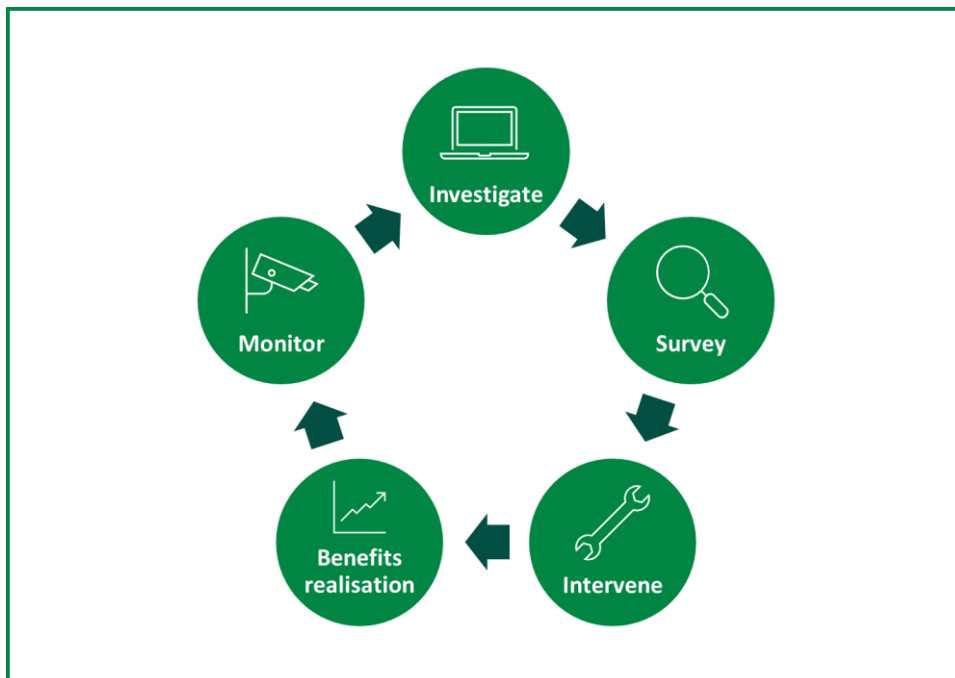
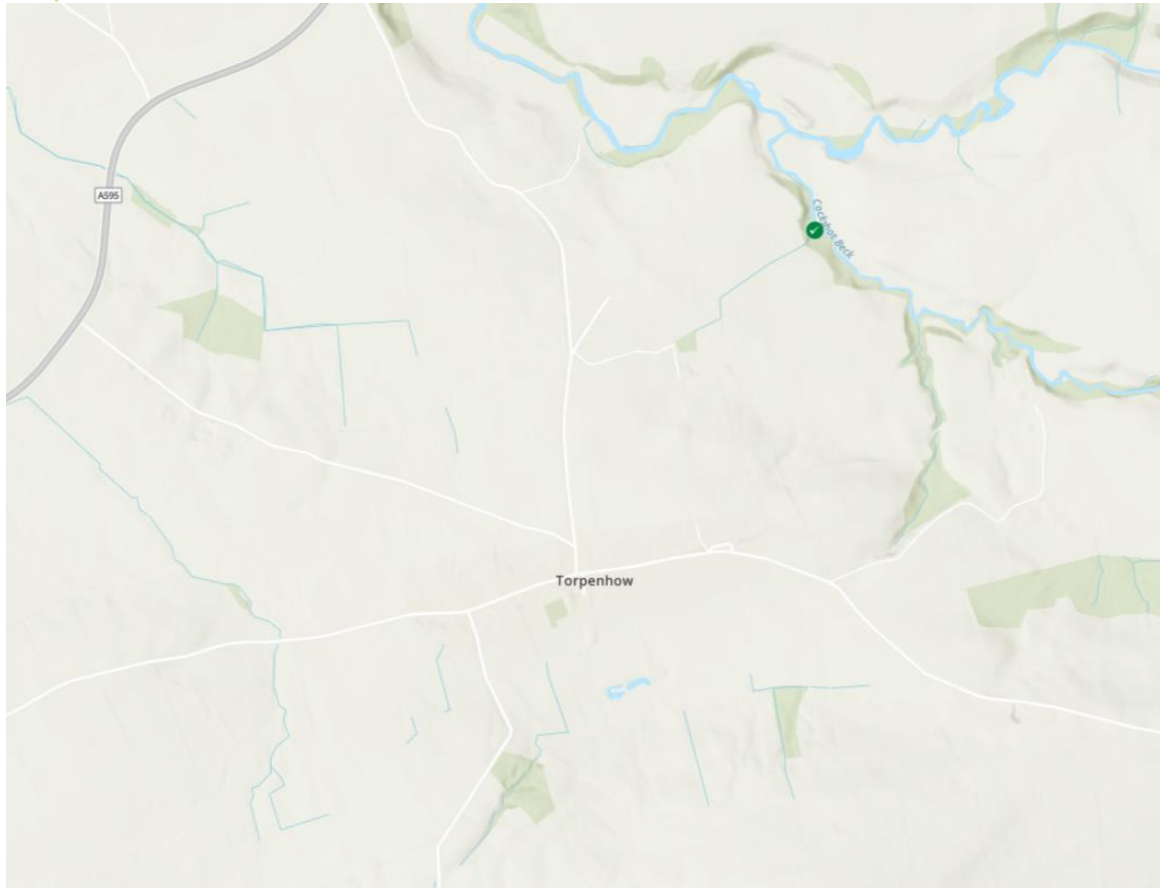


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

## 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 possibility 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

Comprehensive CCTV surveying of the area is planned for Winter 2024 to identify possible infiltration and inflows to the sewer. This may be extended to Winter 2025 if surveying is not conclusive. The CCTV survey information will then be assessed using Artificial Intelligence to identify outstanding infiltration and inflow issues that need addressing.

As well as CCTV, surface water modelling software will be used to complete a hydrological and topographical assessment to identify opportunities for natural flood management in the catchment to reduce the impact of rural runoff on sewer capacity.

## Next steps

Torpenhow is currently in the surveying stage of identifying and addressing infiltration (see Figure 1). If the CCTV survey reveals groundwater infiltration, interventions will be considered, and the site will follow an iterative intervention regime to monitor the efficacy of the solution. Remedial works for the identified defects and any infiltration sources identified through surveys could include, but not be limited to, relaying sewers, lining sewer or sealing manholes. This would be expected to be completed in 2025.