

Skelton

Infiltration Reduction Plan

Last Updated: November 2024



Executive summary

Skelton in Cumbria is currently in the survey stage (see Figure 1) to address infiltration and reduce spills at the Skelton Wastewater Treatment Works Storm Overflow (017670116SO). A desktop assessment concluded that there is low likelihood of groundwater infiltration. 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.

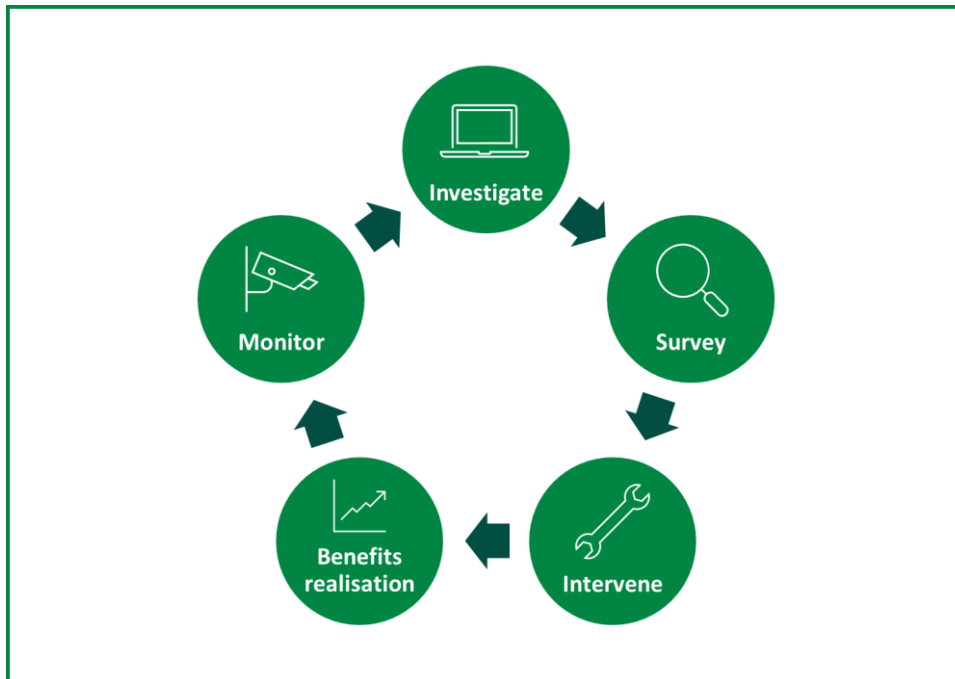


Figure 1: Iterative process to investigate, identify and address groundwater infiltration

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 Skelton drainage area and the associated overflow Skelton Wastewater Treatment Works Storm Overflow (017670116SO). 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.

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Figure 2: United Utilities – Better Rivers – Storm Overflow Map (October 2024). The green, most northerly dot, marks the Skelton WwTW Storm Overflow.

Skelton, North East Cumbria, is a small village and civil parish that lies around 6km outside the Lake District National Park Boundary, northwest of Penrith in close proximity to Grise Beck.

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 infiltration was unlikely in the catchment. However, further observations identified an area of catchment where a rural stream runs adjacent to public sewers. It may be that flow from this stream can enter the sewer system through pipe defects, leaky joints or issues with manholes.

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

It is expected that if groundwater infiltration is found, it will not significantly reduce spill count at Skelton Wastewater Treatment Works Storm Overflow.

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

Skelton 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 at Skelton could include, but not be limited to, relaying sewers, lining sewers or sealing manholes. This would be expected to be completed in 2025.