

Orcheston Infiltration Reduction Plan Summary

This provides an update on the last year's groundwater situation, what mitigation actions, if any, were taken and a summary of our action plan to prevent flooding due to groundwater infiltration of our sewer network.

April 2021 – March 2022

Winter groundwater levels across the region were relatively low, with peak levels comparable to the winters of 2014/15 and 2016/17. Following high groundwater levels during the preceding winter, groundwater levels rose again in May 2021 with a monthly rainfall 66% above the long-term average (LTA) (fourth highest UK May rainfall on record). This particularly affected areas in the north of the region. During the autumn, heavy rainfall in October (33% above the LTA) caused groundwater levels to rise. However, below-average rainfall between November 2021 and March 2022 meant that most catchments were not severely affected by infiltration. Local groundwater did not reach critical levels, and the network in Shrewton and Orcheston was able to cope. In Shrewton the two incidents of backing up attributed to inadequate hydraulic capacity (IHC) occurred on 2nd April 2021, due to high groundwater levels the previous winter.

Action Plan

Annual activity

- Routine jetting of vulnerable sewers to maximise capacity.
- Stakeholders meeting to establish roles and responsibilities with local authorities.
- Review existing asset and operational data and produce an Infiltration Reduction Report.
- Investigate and review Annual Infiltration Reduction Update.
- Continued monitoring of telemetry.
- Promotion of multi-agency approach particularly during times of high groundwater level.
- Routine review of telemetry; compared with borehole data, local watercourse data, rainfall data and Customer incidents to assess residual levels of infiltration.

Completed to date

- Put in place a procedure for recording, investigating and resolving incidents.
- Pro-active inspection of public sewers. Identify infiltration using CCTV.
- Undertook pro-active inspection of sewers using ElectroScan.
- Analysed flows in the sewers using flow survey and modelling.
- Sewer and manhole sealing of the public system where proven to be cost effective.
- Carried out pump station surveys and asset update, where necessary.
- Reviewed historic telemetry and rainfall records.
- Initiated monitoring of local watercourses to indicate local groundwater levels and inform Operational Mitigation Action Plan (OMAP).

	2015-20	2020-21	2021-22
Length of sewer inspected (m)	399	1,894	3,182
Length of sewer sealed (m)	33	-	-

Short term

- Extensive pro-active inspection of public sewers to identify infiltration using CCTV.
- Use of machine learning and rainfall forecasting to predict flows in sewers.
- Add OMAP layer to Drainage and Wastewater Management Plan Hub for Risk Management Authorities.
- Continued sewer and manhole sealing of the public system where proven to be cost effective.
- Investigate the use of Artificial Intelligence (AI) to code CCTV, increase survey efficiency and help identify defects and hotspots.

Medium term

- CCTV and targeted infiltration studies according to analysis from previous surveys of s105a sewers.
- Undertake pro-active inspection of public sewers as set out in Sewerage Risk Management Manual. Identify infiltration using CCTV.

Long term

- Inspection of private gullies drains and manholes.
- Remedial works of private assets (where appropriate and if permitted).
- Monitor and regulate surface water disposal to prevent surface water to foul misconnections.
- Consider sustainable solutions such as above ground attenuation.

Current Performance

This graph compares operational incidents with the flow at Homanton Sewage Pumping Station (SPS) and groundwater at Tilshead. There is a clear correlation between high groundwater levels, and pump run times, wet well levels and incidents attributed to IHC. However, the groundwater level at which these incidents have occurred has increased over time, demonstrating that the sealing works have had a positive impact on the catchment. The reduction in the number of incidents reported also demonstrates this. This is particularly evident in Orcheston, where no IHC incidents have been reported since April 2020, despite high groundwater levels in March 2021. This shows that the extensive sealing works have had success in reducing the inflow to the network. Whilst improvement has been seen at Homanton SPS, further incidents were reported in the winter of 2020/21. This partly due to a limit on the flow that the site can pass forward, to prevent overloading the Water Recycling Centre downstream.

