

Cromhall 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 2022 – 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. The Cromhall catchment was not severely affected, and the Operational Mitigation Action Plan (OMAP) for Townwell SPS did not need to be instigated. There were no sewer flooding incidents caused by inadequate hydraulic capacity (IHC).

Action Plan

Annual activity

- Review asset and operational data and update annual reports.
- Continue monitoring system performance using telemetry, rainfall records and local groundwater levels.
- Communicate with other authorities during times of elevated groundwater levels and promote a multiple agency approach.
- Pro-active maintenance of vulnerable sewers including routine jetting.

Completed to date

- Put in place a procedure for recording, investigating and resolving incidents.
- Pro-actively inspected public sewers and identified any infiltration using CCTV.
- Customer engagement on sewer overloading and the need for risk-based approach to improvements.
- Undertook pro-active maintenance and jetting of vulnerable sewers to maximise capacity where necessary.
- Wessex Water infiltration [video](#) added to website.
- Sewer lining and manhole sealing of the public system where proven to be cost effective.
- Reviewed existing regional borehole data.
- Routinely reviewed telemetry compared with borehole data and other factors to assess residual levels of infiltration.
- Monitored local watercourse data and groundwater levels during periods of inundation to inform operational mitigation plans.
- Carried out pump station surveys and updated asset records where necessary
- Risk modelling of Wessex Water Assets to plan which catchments require proactive surveys as set out in Sewerage Risk Management Manual

- Analysed flows in the sewers, using historic and current telemetry, rainfall, flow surveys and modelling where appropriate.
- Appraisal of flooding incidents.
- Liaise with the Environment Agency regarding their groundwater warning modelling and service.
- Use of machine learning and rainfall forecasting to predict flows in sewers and detect blockages.

	2015-20	2020-21	2021-22
Length of sewer inspected (m)	1,170	1,886	198
Length of sewer sealed (m)	1,487	10	-

Short term

- Undertake rehabilitation work based on the survey findings where cost beneficial.
- Investigate the use of Artificial Intelligence to code CCTV footage, increase survey efficiency and help identify defects and hotspots.

Medium term

- Identify road gullies and other impermeable areas connected into the foul sewers and remove them where cost effective.
- CCTV and targeted infiltration studies according to analysis from previous surveys and telemetry data.
- Commission pump station surveys where necessary.
- Further infiltration sealing according to study findings.

Long term

- CCTV and targeted infiltration studies according to analysis from previous surveys of s105a sewers.
- Where areas of infiltration in private drainage systems are found, pass information on to the Council for further action. WW to consider funding private improvements.
- Review long term options for monitoring and improving data collection for example Event Duration Monitoring.
- Inspection of private gullies, drains and manholes.
- 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 shows incidents against river level (as measured at Frampton Cotterell) and telemetry at Townwell Sewage Pumping Station (SPS). Extensive sewer lining has taken place since 2017 to prevent groundwater infiltration into the network. In conjunction with the OMAP, this has reduced the number of sewer flooding incidents in the catchment. However, there remains a strong correlation between the rise in groundwater levels and incidents attributed to inadequate hydraulic capacity (IHC). This was particularly evident in 2019-20, when river levels were the highest since 2013. This winter, river levels were lower, and the pumping station was not overwhelmed.

