

6 Strategy development

The Drainage Strategy for the Fairford catchment is currently at Stage 1 (Initialise/prepare), of the 4-stage framework process. The following activities in Table 4, are planned and ongoing, in order to carry out the risk assessment and development of our strategy options.

Table 4 Activities planned and ongoing to enable strategy development

Activity	Purpose	Date planned	Outcome
Stakeholder engagement	This document will be circulated to the Environment Agency, Lead Local Flood Authority (Gloucestershire County Council) and Cotswold District Council before being published on our website. The Local Flood Forum will continue to be used as the primary route for stakeholder engagement. All third party data will contribute to drainage strategy development.	Ongoing	Stakeholders informed about progress and timing of works to reduce the risk of flooding. Work carried out by Thames Water is coordinated with activities of other partners involved with drainage.
Monitoring of pumping stations	To monitor performance of pumping stations and pumped flows within the catchment.	Ongoing	Use information to identify additional actions for inclusion in the drainage strategy for Fairford. Share information with other agencies.
Sewage treatment works storm discharge monitoring	Monitor the discharges from the storm tanks.	From winter 2015	Use information to identify additional actions for inclusion in the drainage strategy for Fairford. Share information with other agencies.
Connectivity surveys	Carry out visual inspection of properties to determine the extent of roof drainage and other surface water drainage that discharges into the foul sewer network when appropriate.	From winter 2015	A better understanding of the contribution that surface water connections make to foul sewer flooding in the area.
Sewer and manhole surveys	Ascertain sewer and manhole condition and evidence of infiltration via CCTV survey and manhole "lift and look" surveys when appropriate.	From winter 2015	Use information to identify additional actions for inclusion in the drainage strategy for Fairford. Share information with other agencies.
Update drainage strategy	Improve the drainage strategy based on the initial results from the permanent monitoring, customer surveys, connectivity surveys and feedback from stakeholders.	2017	Risk assessment, options appraisal and preferred strategy to be completed, subject to capturing weather events through monitoring and surveys.
Consider innovative solutions	Identify quicker / cheaper / collaborative options that improve the benefit to cost ratio in order to keep customers' bills down to prioritise investment to ensure greatest benefit to customers.	Ongoing	Enhanced toolkit available to reduce the risk of sewer flooding and then apply this once data becomes available.

7 Preferred strategy and plan

We believe that the foul sewerage system in Fairford has surcharged and flooded predominantly due of a combination of groundwater infiltration, surface water run-off from saturated fields, surface water inundation from highways, public spaces and properties, surface water connections and river water overflowing from the River Coln. Our network strategy is to understand the relative impact that

each of these factors has on the risk of sewer flooding, and then to develop a plan comprising cost beneficial solutions using customer willingness to pay research. In parallel, we will assess the extent to which new developments may be significant in the context of challenges currently experienced and where necessary, we will develop solutions to accommodate the proposed development in the catchment.

We may carry out some repair works as this strategy develops, in the event that our investigations identify faults or problems with the sewerage network that are highly likely to have caused flooding. Table 5 below details the repair activities that we have identified to date.

Table 5 Activities identified in preferred plan to date

Activity	Purpose	Date planned	Outcome
Localised sewer rehabilitation	Undertake localised sewer rehabilitation to include lining, patch repairs, localised pipe replacement and manhole repairs identified through survey work and where considered cost effective in reducing ingress of ground water.	When identified	Reduce infiltration into the public sewers.
Manhole cover replacement	Replace manhole covers with leak tight covers where identified through survey work.	When identified	Stop ingress of surface water through manholes located in flood plain.
Connectivity surveys	Carry out visual inspection of properties to determine the extent of roof drainage and other surface water drainage that discharges into the foul sewer network when appropriate, and to work with stakeholders to remedy misconnection of surface water identified into the foul sewer.	From winter 2015	A better understanding of the contribution that surface water connections make to foul sewer flooding in the area and to stop ingress of misconnected surface water

Our plan will be updated and shared once the Risk Assessment and Options Appraisal sections have been completed in accordance with the Drainage Strategy framework.

8 Temporary overflows

We have not installed temporary pipework and pumps in the sewerage network during wet weather events in Fairford to maintain service, but we would consider doing so to prevent the backup of sewerage into customers' properties and uncontrolled spilling from the sewer system into the environment.

As part of the stage 2 risk assessment and stage 3 options appraisal, we will be

investigating the circumstances under which emergency discharges would be required in future, such as the use of temporary overflows, to pump out from the sewerage network through biological filters to maintain service to customers and prevent homes from flooding. As this Drainage Strategy develops, in this section we will describe the location of any proposed temporary overflows and the circumstances under which we would use

them, in order that this Drainage Strategy, together with our plans to reduce infiltration, fully meets the requirements of an Infiltration Reduction Plan as set out in the Environment Agency's Regulatory Position Statement. We will continue to identify sewer rehabilitation and other permanent works to reduce groundwater infiltration alongside refining the use of temporary overflows.

Appendix A

Glossary of terms

Term	Definition	Term	Definition
Blockages	Obstacles or the build-up of fat and grease, block or obstruct our sewerage pipes. This is normally caused by things which should not be flushed, or poured, into drains and sewers.	Inundation	the brickwork or defects in manhole structures. Accumulated surface water from rain and/or river floodwater that has resulted in localised flooding, finds its way into the sewerage system through manhole covers and drains. These may be public or private.
Combined sewer	A pipe conveying the combined rainwater and contaminated wastewater from two or more properties. A combined sewer is designed to carry wastewater to a sewage works for treatment but during periods of heavy rainfall or snowmelt, the volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water courses.	Lateral drain	See definition for Foul drain.
Dry weather flow	The average flow rate observed over a 24 hour period in dry weather and based on Sewers for Adoption, the industry standard, includes an allowance for infiltration of 10% of the calculated flow rate.	Misconnections (surface water to foul water)	Property owners have connected rainwater and/or land drainage to our sewers (e.g. roof drainage, paved driveways drains, soakaway overflows), and can cause major issues for the performance of the sewerage system.
Foul drain	A pipe conveying the contaminated wastewater from a single property. If the pipe extends beyond the property boundary, the portion of the pipe outside of the boundary is termed a lateral drain. The portion of the pipe inside the boundary is a private drain. On 1 October 2011 water and sewerage companies in England and Wales became responsible for lateral drains, which were previously the responsibility of property owners. Private drains remain the responsibility of property owners.	Misconnections (foul water to surface water)	A plumbing mistake resulting in wastewater appliances being misconnected to the surface water system.
Foul sewer	A pipe conveying the sewage from two or more properties. On 1 October 2011, water and sewerage companies in England and Wales also became responsible for private sewers, which were previously the responsibility of property owners. A foul sewer is designed to carry contaminated wastewater to a sewage works for treatment. It disposes of wastewater from sources including toilets, baths, showers, kitchen sinks, washing machines and dishwashers.	Private sewers	See definition for Foul sewer.
Infiltration	Groundwater finds its way into the sewerage system (including private drains), via defective pipes or pipe joints and through	Rainfall induced infiltration	Sewer infiltration that occurs as a result of rainfall percolating into the ground impacting the sewer on route to recharging the groundwater table.
		Riparian owner	If you own land adjoining, above or with a watercourse running through it, you have certain rights and responsibilities. In legal terms you are a 'riparian owner'. If you rent the land, you should agree with the owner who will manage these rights and responsibilities.
		Soakaway	Surface water from a roof and driveway of a property is piped to an underground pit, usually filled with gravel or similar material. Some soakaways are situated within the boundary of the property.
		Surface water drain	A pipe conveying uncontaminated rainwater from a single property.
		Surface water sewer	A pipe containing uncontaminated rainwater from two or more properties. A surface water sewer is designed to dispose of rainwater from roofs, driveways, patios, roads, etc to a local watercourse.
		Sustainable Drainage Systems (SuDS)	Measures designed to attenuate and slow down surface water before it enters sewers to reduce the risk of flooding following heavy rainfall. Includes green infrastructure such as raingardens, green roofs as well as other measures, such as permeable paving and water butts.

Appendix B

Supporting figures and photographs

Figure B1 Fluvial flood risk for Fairford based on Environment Agency plans

This flood risk map information has been sourced from the Environment Agency website. For more detailed flood map information for this catchment, please access the Environment Agency website.

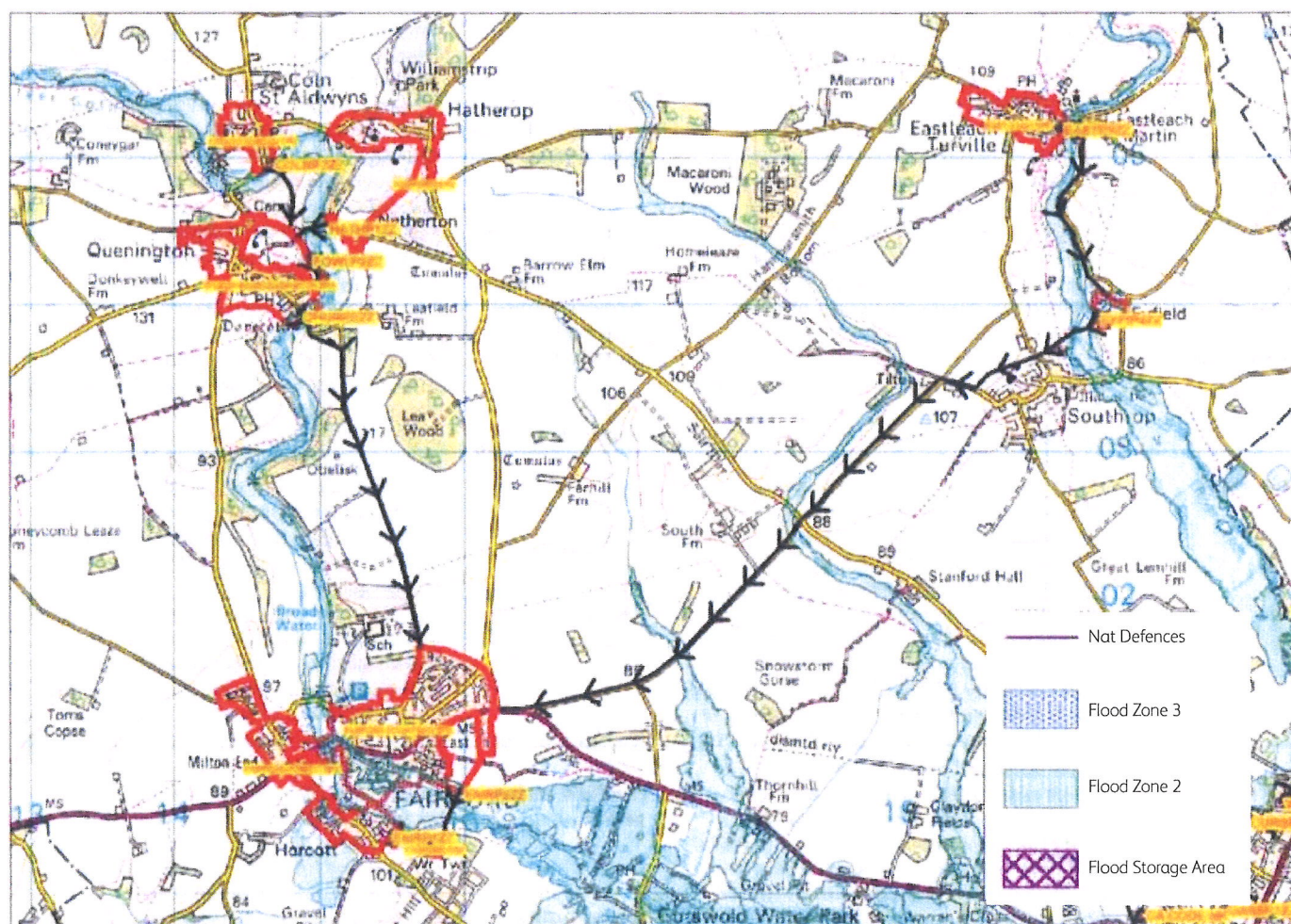


Figure B2 Surface water flood risk for Fairford from Environment Agency plans

This flood risk map information has been sourced from the Environment Agency website. For more detailed flood map information for this catchment, please access the Environment Agency website.

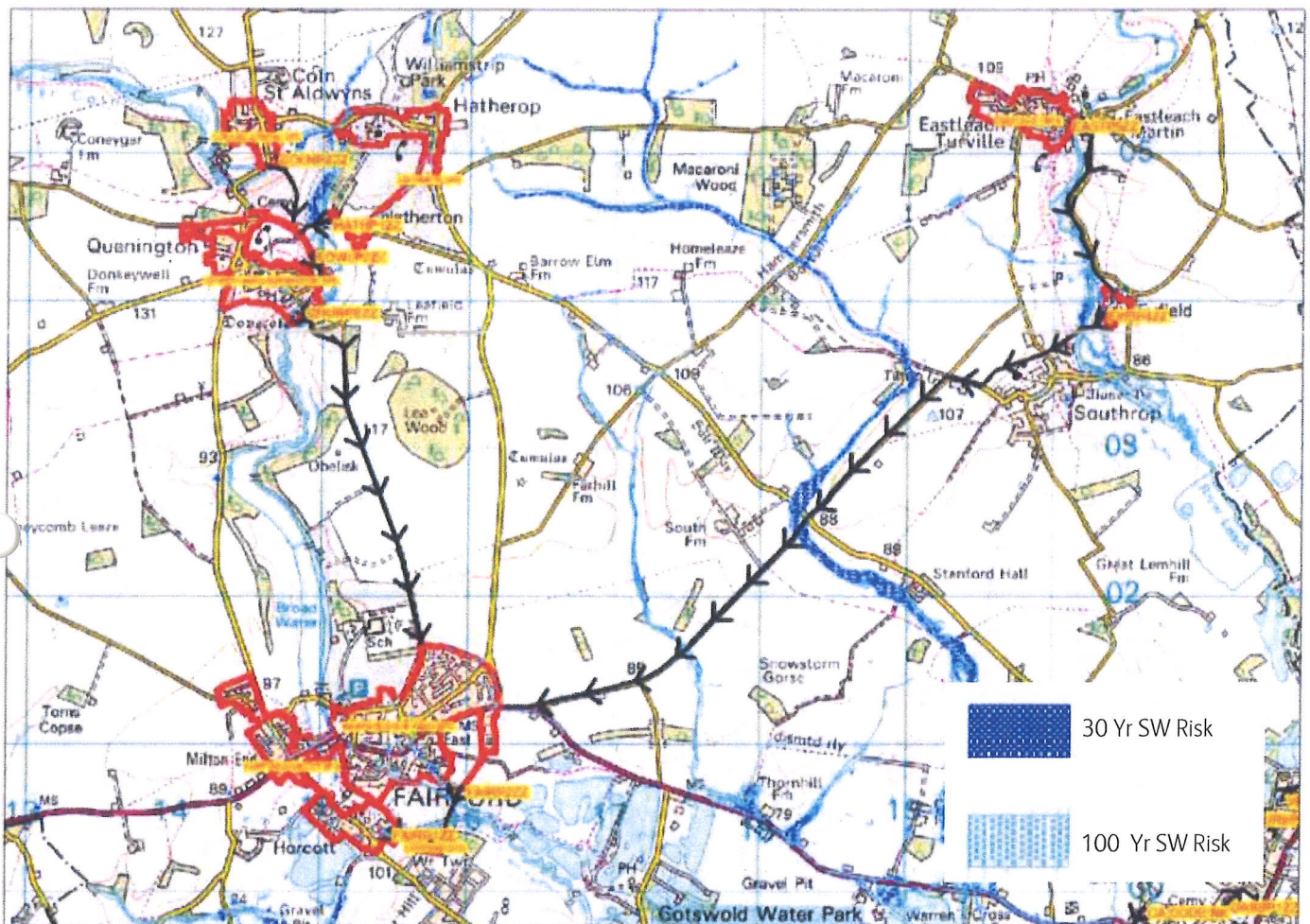


Figure B3 Groundwater flood risk for Fairford



ESI Groundwater Flood Risk Map of England and Wales © www.esinternational.com

Figure B4 Fairford bedrock and drift geology

This watercourses map information has been sourced from the Environment Agency website. For more detailed flood map information for this catchment, please access the Environment Agency website.

