

Section 19 Flood Investigation Report

Date: 10th April 2025

Section 19 Flood Investigation Report: Wheatley
Date of Flood Incident: 23rd / 24th September 2024

**Based upon a flood investigation report prepared by
South Oxfordshire District Council (10/04/2025)**

Revision Schedule

Version	Date	Details	Author	Checked	Approved
1	10/04/2025	Final Report	D Bell – (South Oxfordshire District Council)	W Piotrowski – (South Oxfordshire District Council)	C. Brown - (Oxfordshire County Council)

Executive Summary

This investigation has reviewed significant flooding that occurred in the village of Wheatley, Oxfordshire on 23rd and 24th September 2025.

It has been concluded that flooding was primarily caused by heavy rainfall of over 120mm in a 24-hour period overwhelming drainage infrastructure. The most significant flooding affected Wheatley High Street and adjacent roads with the resulting storm flow significantly greater than the capacity of a culverted watercourse running under the High Street. Flooding from the culvert entrance extended down the High Street and followed the natural low points within the village to Crown Square where the watercourse re-emerges to the north of the square.

Although exact figures are unknown, it is estimated that approximately 50 properties experienced flooding internally with significant water depths reported in several locations. Damage to property has forced many residents to find temporary accommodation and local businesses have also been severely affected.

At the time of writing this report, investigations into the condition of key culverted watercourses and surface water sewers within the village is ongoing.

Although the risk of flooding to properties in this area cannot be fully mitigated, there are recommendations that could reduce the impact and potential extent of any future floods.

Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
Complete Hydraulic Flood Modelling study and assessment (ongoing)	South Oxfordshire District Council Environment Agency	-Oxfordshire County Council (Resilience Team) Wheatley Parish Council Landowners Wheatley Flood Group
Assess flood alleviation proposals to reduce flood risk (project has commenced and is ongoing) and prepare business case for approval by Environment Agency	South Oxfordshire District Council Environment Agency	-Oxfordshire County Council (Resilience Team) Wheatley Parish Council Landowners Wheatley Flood Group

Assess condition of key surface water sewers and main culvert	Oxfordshire Highways	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council
Review the frequency of maintenance of highway drainage assets, and look at increasing the frequency of cleansing in line with the current Countywide Highway Maintenance Programme and funding	Oxfordshire Highways	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council Wheatley Parish Council
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs.	Homeowners	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council
Riparian and drainage asset owners to clear blockages and repair / reconnect sections of drains identified as defective.	Riparian owners and drainage asset owners	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council
Refresh and improve community awareness, resilience and preparation for flooding, including production of community emergency plan	Community Flood Group and wardens	-Oxfordshire County Council (Resilience Team) - Vale of White Horse (Emergency Planner) - Oxfordshire County Council (Flood Risk Management Team)
Support community flood group and flood warden activities with additional training and materials.	Community Flood Group and wardens	-Oxfordshire County Council (Resilience Team) - Vale of White Horse (Emergency Planner) - Oxfordshire County Council (Flood Risk Management Team)

CONTENTS

1. INTRODUCTION	1
1.1. Lead Local Flood Authority (LLFA) Investigation.....	1
1.2. Site Location and context.....	2
1.3. Previous flood events.....	7
2. RECENT FLOOD ISSUES AND INVESTIGATION	9
2.1. Recent flood events	9
2.2. Rainfall data analysis	12
2.3. Existing Level information	13
2.4. Hydraulic Assessment.....	14
3. CONCLUSIONS	20
4. RIGHTS AND RESPONSIBILITIES	21
4.1. Communities and Residents	21
4.2. Lead Local Flood Authority (LLFA).....	21
4.3. Highway Authority (Oxfordshire Highways).....	22
4.4. Water Authority - Thames Water Utilities (TW)	22
4.5. South Oxfordshire District Council	23
4.6. Environment Agency (EA).....	23
4.7. Land Owners and Developers.....	24
5. RECOMMENDATIONS	25
5.1. General	25
5.2. Main Recommendations	26
5.3. Communities and Residents	27
5.4. Lead Local Flood Authority (LLFA).....	28
5.5. Highway Authority (Oxfordshire Highways).....	28
5.6. Water Authority Thames Water Utilities (TW).....	29
5.7. South Oxfordshire District Council	29
5.8. Land Owners and Developers.....	30
6. DISCLAIMER	32
ACRONYMS	32
USEFUL LINKS	33
EA - Prepare your Property for Flooding:	33

EA - Sign up for flood warnings: 33
EA - Up to date information on flood alerts & warnings: 33
Flood and Water Management Act 2010 33
USEFUL CONTACTS 33
Environment Agency: 33
Thames Water 33

1. INTRODUCTION

1.1. Lead Local Flood Authority (LLFA) Investigation

Section 19 of the Flood and Water Management Act (F&WMA) states:

- 1) On becoming aware of a flood in its area, a Lead Local Flood Authority must, to the extent that it considers it necessary or appropriate, investigate: -
 - a. which risk management authorities have relevant flood risk management functions, and
 - b. whether each of those risk management authorities has exercised, or is
 - c. proposing to exercise, those functions in response to the flood.
- 2) Where an authority carries out an investigation under subsection (1) it must: -
 - a. publish the results of its investigation, and
 - b. notify any relevant risk management authorities.

The LLFA have a set criteria which determines when a S19 report is required. The criteria is set out below.

LLFA/OCC Criteria

- Internal flooding (excluding to basements) to five or more residential properties or businesses within an area of 1km².
- Internal flooding of a business premises employing more than 10 people within an area of 1km².
- Internal flooding (excluding to basements) of at least one property or business for one week or longer.
- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.

Caused a transport link to be impassable:

- Motorways, trunk roads, Class A and B highway closures shall all be investigated.
- Class C highways – 10 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.
- Class U highways – 24 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.
- All rail link closures shall be investigated.

Any flooding event that a risk management authority deems significant but does not meet the agreed thresholds should be put forward to the Agency flood group meeting for consideration.

1.2. Site Location and context

The village of Wheatley is located approximately 5 miles to the east of Oxford city centre in the county of Oxfordshire. A site location plan is included in Figure 1.

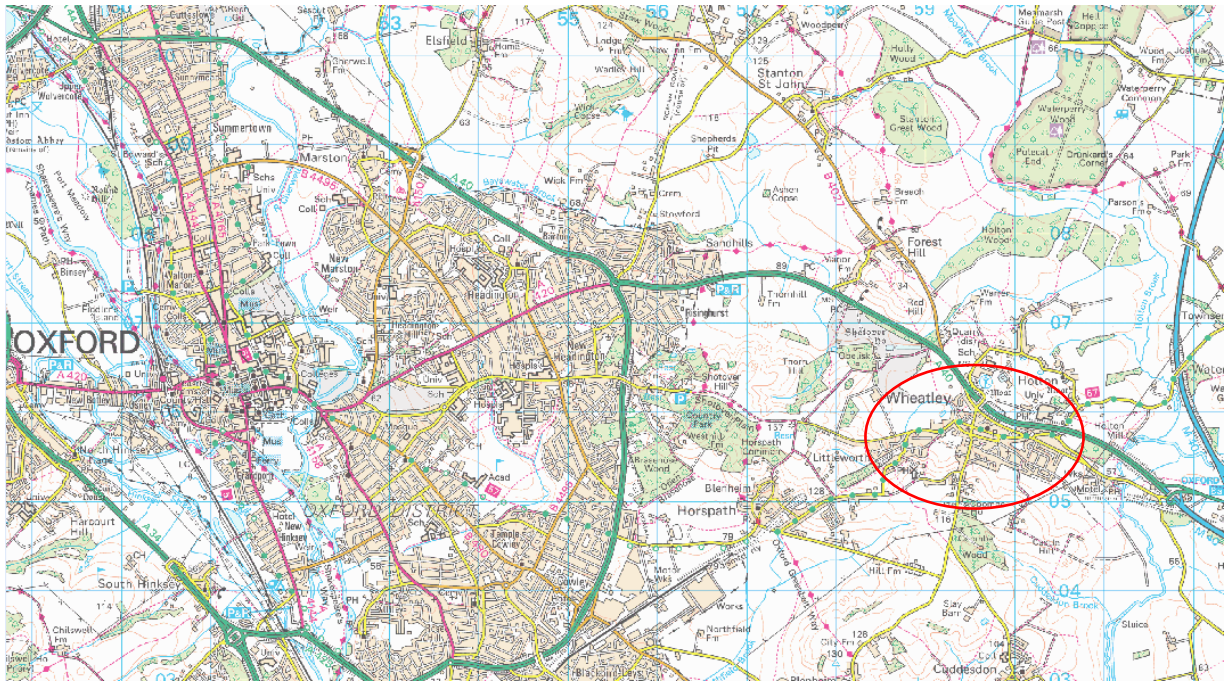


Figure 1 - Site Location Plan - © Crown copyright and database rights 2024 OS [1000018668].

Wheatley is located in a small valley with relatively steep streets leading down towards the central High Street. There is higher land to the west associated mainly with the Shotover Estate and this combines with Littleworth and Wheatley to form the main catchment area for the Wheatley Brook, which runs through the village and the catchment plan is shown in Figure 2.



Figure 2 – Wheatley Brook Catchment Area © Crown copyright and database rights 2024 OS [1000018668].

The catchment is a mixture of rural and urban areas and has relatively steep profiles, particularly in the hillier land to the west of the village. One of the main sources of the brook is located at a spring just to the west of the village of Littleworth close to a former railway cutting which is now a local nature reserve. This watercourse continues in a mixture of culverts and open channel before discharging under Old Road at the Keydale Road junction to a section of open channel between a school field and Shotover Estate land. On Shotover Estate there is a main tributary connecting flow from a source close to Home Farm and this then continues in a section of open channel before entering the village close to Westfield Road through a brick arch, at which point a large trash screen has been constructed. This is highlighted by a green marker on the plan in Figure 2.

The Wheatley Brook then runs through rear gardens of properties before entering a culvert adjacent to a residential property close to the junction between Littleworth Road, High Street and Kiln Lane. This 600m long culvert then runs under the length of the High Street before emerging to the north side of Crown Square. The watercourse then continues with a steeper gradient between rear gardens before entering a culvert at London Road. This then continues to flow through Wheatley close to the Old London Road and London Road before entering the flood plain of the River Thames. The watercourse confluences with the river just to the north of the road bridge highlighted by the orange marker on the plan in Figure 2.

Changes have been made to the route of the watercourse over the years. The course of the brook previously routed behind what is now a row of shops on High Street and through rear gardens to Crown Square. The culvert instead takes a more direct route under the High Street. The natural low point of the valley however follows the natural course of the brook with the High Street rising at the location of the shops. The map below from the 19th century shows the old route of the watercourse prior to being culverted in the mid 19th century. There is no link behind the shops as such, with a smaller culverted watercourse from the south draining under Farm Close Road and then through garden areas between High Street and Farm Close Lane on part of the former route of the main brook. This is highlighted on the plan in Figure 3.

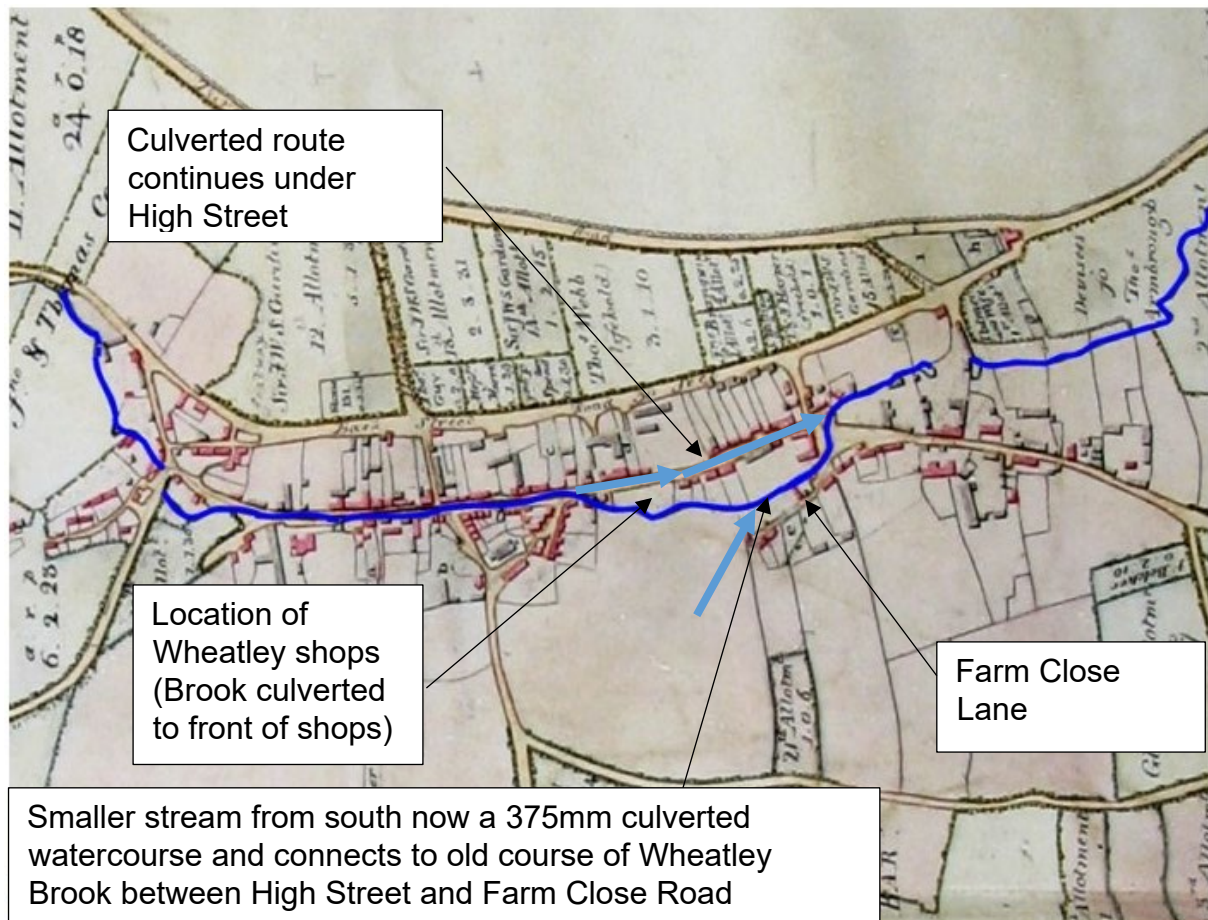


Figure 3 – Historic map of watercourse route (from Wheatley Village Archive)

There are various other connections of surface water sewers to the brook where it runs under the High Street of Wheatley draining other areas of the village. A detailed plan showing the general routes of watercourses, culverts and other key drains is included in Appendix A.

A further change in watercourse route is further downstream in the London Road / Old London Road area. To reduce risk to the industrial estate to the south of the London Road, the main exceedance flow of the brook was diverted to the north of the road. There remains a smaller culvert under the road to direct baseflow to the old channel.

1.2.1 Flood Maps

A copy of the fluvial flood map is included in Figure 4. This has been updated recently (March 2024) and highlights that areas close to the Wheatley Brook are at higher risk of flooding. The brook is spring fed and the main sources are shown in Figure 5, which also shows the steeper relief of the catchment, particularly to the south and west of the village.

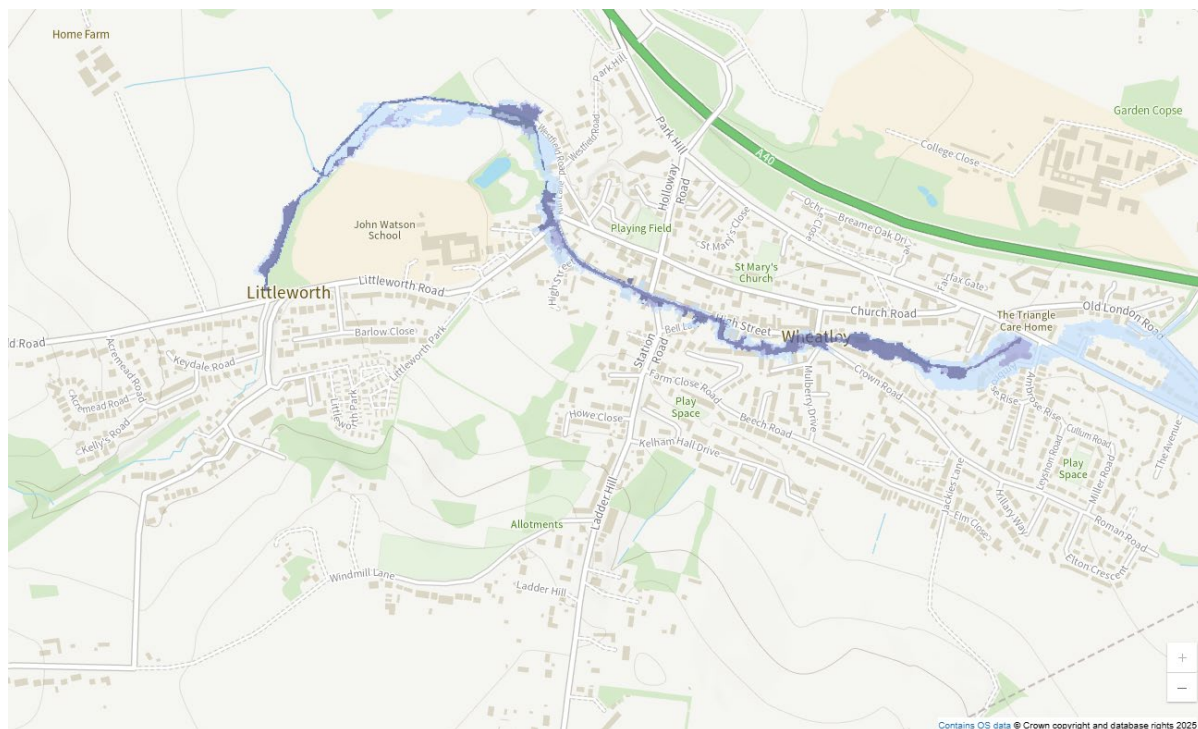


Figure 4 – Environment Agency Flood Map for Planning (contains OS data © Crown copyright and database rights 2025 Ordnance Survey AC0000851087)

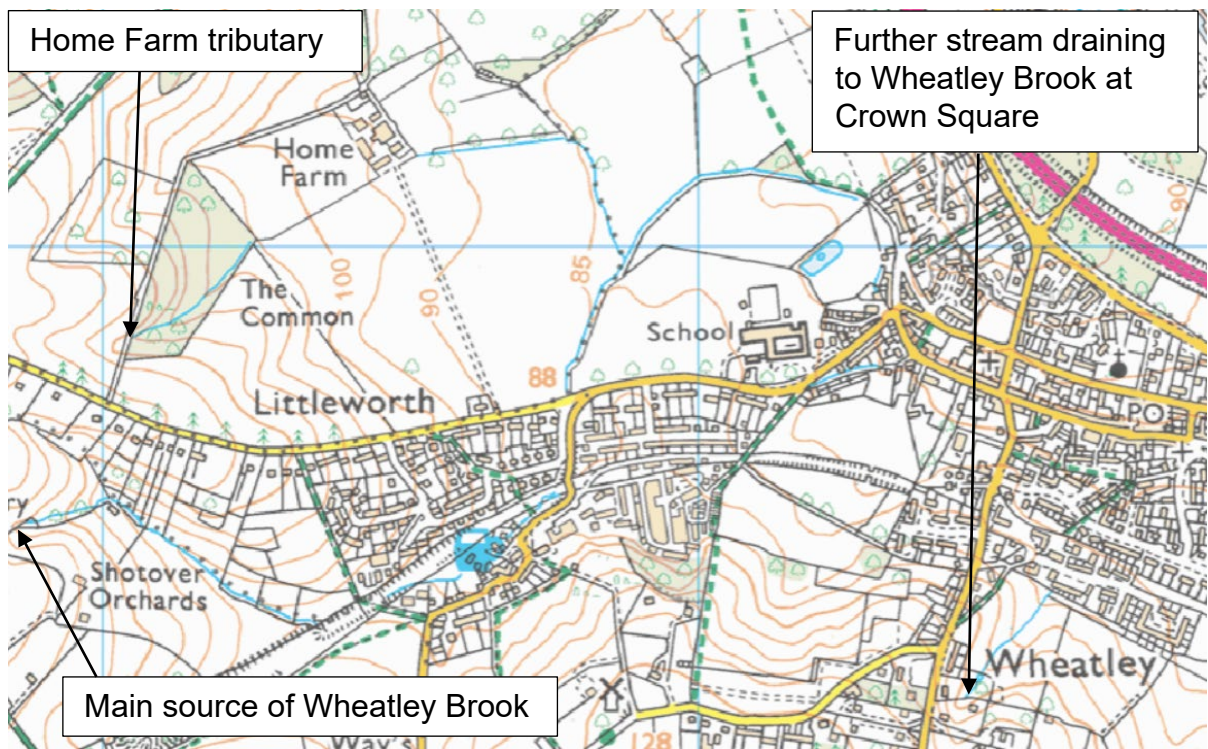


Figure 5 – Main sources of the Wheatley Brook © Crown copyright and database rights 2024 OS [1000018668].

The surface water flood map for the area is shown in Figure 6. This flood map highlights potential overland flow paths, however, does not necessarily take into consideration the effect of all below ground infrastructure. The former natural route of the brook is highlighted with water routing from High Street behind a row of shops before making its way back to the open section close to Crown Square.



Figure 6 – Environment Agency Surface Water Flood Map (contains OS data © Crown copyright and database rights 2025 Ordnance Survey AC0000851087

1.2.2 Geology

the British Geological Survey geology of Britain viewer is included in Figure 7 showing the general geology of the area. In the upper reaches of the catchment, more permeable sandstone and limestone from the Whitchurch Sand Formation (blue) and Portland Group (orange) are present. The lower area to the west of and through the southern part of the village consists of more impermeable clay and mudstone from the Kimmeridge and Ampthill formations (red and green) and there are also some head and alluvium superficial deposits in areas mainly along the watercourse corridor. The area in the north of the village is formed of more permeable Wheatley limestone (pink).

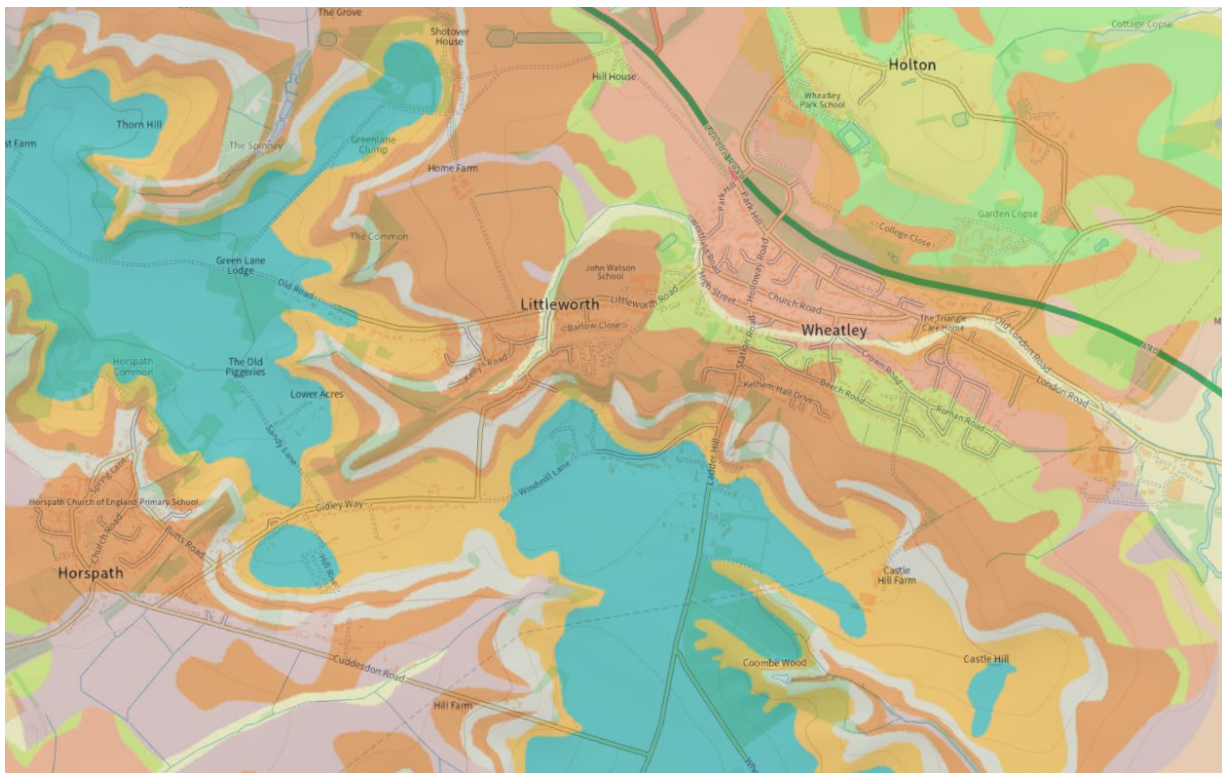


Figure 7 – Bedrock geology details – source British Geological Society © NERC 2011 and Crown copyright and database rights 2024 OS [AC0000807064].

Based on the geology some areas of the village to the north of the High Street drain to soakaways located within the Wheatley Limestone. There is a well located within a property just to the north of the Wheatley Brook by Crown Square within this stratum.

1.3. Previous flood events

On 3rd June 2008, the watercourse exceeded its capacity resulting in flooding along the High Street and around Crown Square in Wheatley. During this event, internal flooding occurred to several properties along the route. Wheatley Flood Group

estimated that peak flow along the High Street during the flood was in the order of around 2m³/s based on a cross section of the street, measured peak flood depths and the estimated longitudinal fall at the location.

In July 2012 a similar pattern of flooding occurred to the event in 2008.

Greater detail on historic flood events is available from Wheatley Flood Group and Wheatley Parish Council.

2. RECENT FLOOD ISSUES AND INVESTIGATION

2.1. Recent flood events

Flooding on 22nd / 23rd September 2024, was one of the worst flood events affecting the village of Wheatley in recent times. The flood effected large areas of the village with flooding along the High Street, parts of Bell Lane, Crown Square and Farm Close Road as well as parts of Littleworth Road and Keydale Road upstream.

Keydale Road Area

In the upper parts of the catchment, flooding affected areas of the former railway cutting, rear gardens and garages of properties in the Keydale area of Littleworth and properties close to the junction with Littleworth Park. Roads were impassable in several places for several hours, in particular at the Keydale Road / Old Road junction with the footpath between Littleworth Road, Kellys Road and the allotments flooded badly. Water flowed from the watercourse down Keydale Road and collected at the junction of Old Road. This is above the route of the main culverted watercourse in this location with the capacity exceeded.



Figure 8 – Photographs of flooding in nature reserve and access footway (source; Wheatley Flood Group)

Barlow Close / Littleworth Road

Flooding affected property at the eastern end of Barlow Close with flooding through garden areas into land associated with a Nursery School on the corner of Littleworth Road.

Central Wheatley Area

In the central areas of the village, the culvert entrance near Littleworth Road was overwhelmed with water streaming along the footpath towards the main road. Flooding spilled out onto the junction between Kiln Lane, Littleworth Road and the High Street before continuing to flood along the High Street above the culvert. At a

junction with a service road to the rear of shops at 66 – 76 High Street, water routed to the rear of the shops and through rear gardens along the natural low point and former route of the watercourse before it was culverted in the 1800's. Water therefore flooded the area between the High Street and Farm Close Road before making its way back onto the High Street and Crown Square.

It was also reported that the well to the north of Crown Square overtopped adding a groundwater element to the flooding with water also flooding out of manholes, particularly at the junction with Friday Lane.

Wheatley Flood Group confirmed a general timeline of events –

08:30: Flows in brook are high

09:45: Some flow down Hollow Way and Station Road but more from upper part of High Street

08:50: Flow increasing outside Kiln Lane from culvert overtopping

10:20: Near peak water levels in Upper part of High Street

11:50 Peak water levels in Crown Square

15:30 Water levels peak in lower end of High Street (flooding from rear) – properties pumped out by Fire Brigade

It is understood that the delayed peak in the lower end of the High Street was partly down to water building up behind walls across the overland flow route between properties. One local resident confirmed that a boundary wall collapsed due to the water pressure.





Figure 9 – Flooding in central Wheatley and collapsed section of wall (source; Wheatley Flood Group)

Old London Road Area

Reports confirmed that the stream flooded above its banks in this area of the village with water flowing overland along Old London Road and through property gardens. It is understood that Wheatley Parish Council assisted with unblocking debris from one of the culverts close to Old London Road where baseflow is taken under the London Road to the old course of the Wheatley Brook.



Figure 10 – Flooding adjacent to Old London Road (source; Wheatley Flood Group)

Flood Summary

Overall approximately 50 properties experienced internal flooding in one of the worst flood events to effect the village. Roads were unpassable for many hours and there was severe damage to property and belongings with businesses badly effected both during the flood and in the aftermath.

Oxfordshire Fire and Rescue attended to a number of call-outs and several roads were closed. The highway drainage and culverts reached capacity with road drains and some manholes surcharged and flooding. As described in the timeline, water levels peaked in the afternoon of 23rd September before subsiding.

2.2. Rainfall data analysis

To assist with the investigation, rainfall data for the September 2024 event has been obtained from the Defra hydrology data explorer. This identifies that 128.4mm of rainfall fell during the event, which makes it one of the most severe storms affecting the catchment in recent times. When reviewing records dating back to 1836, September 2024 was Oxfordshire’s wettest calendar month with more than three times its average September rainfall. Rainfall data covering the September event is detailed in Figure 11.

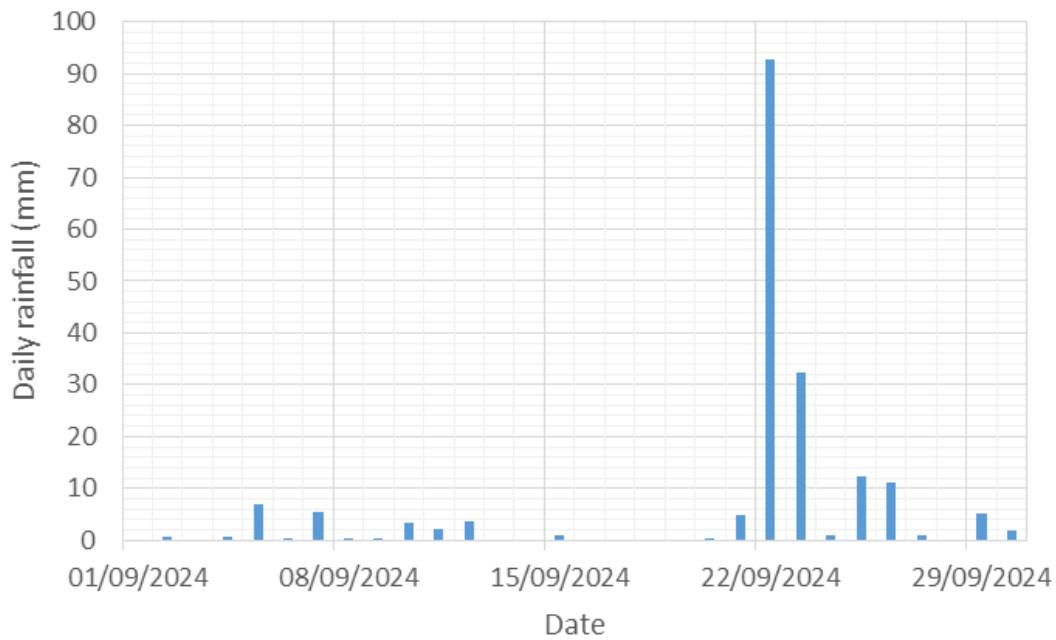


Figure 11 – Rainfall of 22/23 September 2024 (source Environment Agency)

If comparing to total rainfall data from two historic events effecting the village, the 2024 event (128.4mm) was much more significant in terms of total rainfall. The 2008 flood event had 35.4mm and 2012 event 30.8mm, although it is noted that the preceding weeks for these events were wetter, which does have a knock-on effect in terms of field runoff given wetter catchment parameters.

Further hydrological analysis of the September 2024 event using industry standard software suggests a return period of around 1:750 for the event, which highlights the extremity.

2.3. Existing Level information

Lidar (Laser Imaging, detection and Ranging) data of the 2023 survey have been acquired from the Environment Agency to assist with level assessment of the general catchment. Topographical survey work to survey cross sections through the watercourse in strategic locations has been commissioned and work was completed in October 2024. This information is being used to prepare a detailed hydraulic model of the catchment draining through Wheatley to assess options available to reduce the risk of flooding. The general representation of the model is shown in Figure 12 below



Figure 12 – Hydraulic model representation (Contains Ordnance Survey data © Crown copyright and database right 2024 [1000018668].)

At the time of writing this report, the baseline risk mapping for the 1:10, 1:20, 1:50, 1:75, 1:100 and 1:1000yr events has been completed along with an assessment of the September 2024 event to assist with model calibration.

The study continues to use the baseline mapping and updated hydrological data to assess potential options to reduce flood risk to Wheatley.

Detailed CCTV survey work has also been commenced to identify and assess the condition of key surface water sewers and culverts in Wheatley. This work is being undertaken by Oxfordshire Highways and has assessed networks particularly around Crown Square and Littleworth Road.

It is recommended that a survey of the main culvert is undertaken by Oxfordshire Highways to assess the condition and record the profile. It is understood that this can only be undertaken under a road closure and that this will require scheduling.

2.4. Hydraulic Assessment

Main High Street Culvert

The 2024 flood event was extreme and work has been undertaken using ReFH2 software to transform the actual rainfall from the September 2024 event into a hydrograph for hydraulic modelling, event assessment and calibration purposes. The representative hydrograph is shown in Figure 13 and predicts a peak flow of 3.6m³/s during the storm.

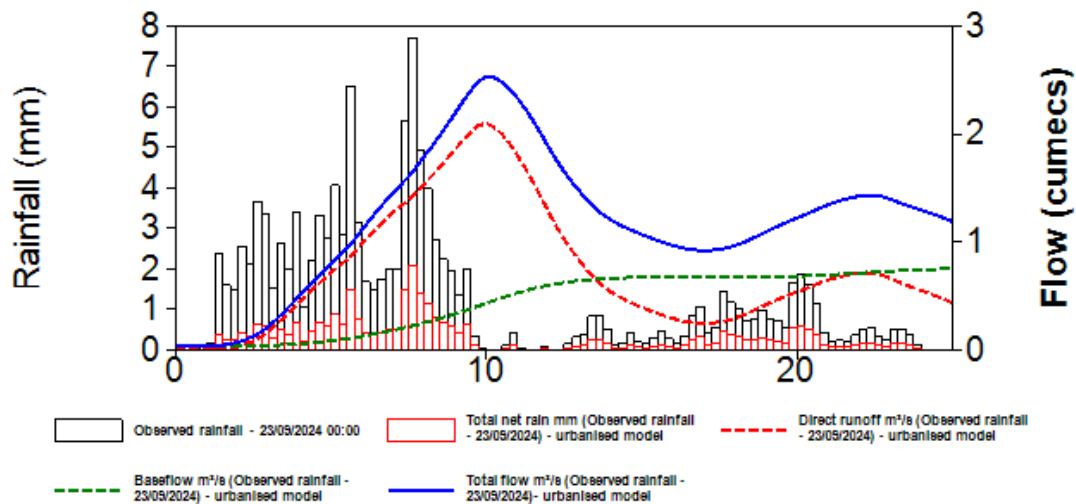


Figure 13 – Representative Flood Hydrograph

As highlighted previously, the Wheatley Brook is culverted under High Street and the entrance to the culvert is located down a small footway close to the junction between Littleworth Road and Kiln Lane. The entrance structure can be seen in Figure 14 and has been surveyed to establish entrance capacity.



Figure 14 – Entrance to main culvert (Source; Wheatley Flood Group)

Hydraulic assessment indicates that this has capacity for a flow of approximately of 0.93m³/s, so significantly less than the peak estimated storm flow of 3.6m³/s.

Following discussions with a local resident, blockage (collection of debris on the trash screen) at the culvert entrance was not considered to be a major contributing factor to the flood. This was due to good maintenance of the grate and the presence of a grate further upstream where the watercourse enters the main part of the village from the adjacent Shotover Estate land. This upstream grate successfully restricts the amount of ‘trash’ carried by the flow to the main culvert entrance, which was reported to be clear to take water with only very small amounts of debris on the screen.

Whilst the culvert profile may change along the route of the High Street, there are significant additional inflow points draining areas of the village both from the north and south along this route, so it is not expected that there would have been any spare capacity elsewhere along the route to take additional flow.

This therefore resulted in exceedance at the culvert entrance across the peak of the storm response until flow dropped back to culvert capacity levels and flooding is therefore because of capacity exceedance.

At the downstream end of the culvert, initial hydraulic modelling analysis indicates that the re-emergence of the watercourse increases flow capacity of the brook, partly due to the steepening of the watercourse as it heads downstream of High Street / Crown Square and the improved cross section of the open watercourse when compared to the culvert.

Crown Square

Survey of the drainage network in and around Crown Square has been undertaken by Oxfordshire Highways and South Oxfordshire Drainage team to better understand the mechanisms in this area and the area between High Street and Farm Close Road. A plan of the findings is included in Figure 16.

This survey did not identify any major blockages within drains surveyed and these were flowing normally during the investigation. Several gullies were noted as requiring maintenance. Since the flooding, Oxfordshire Highways have cleared several gullies, and it was confirmed in March 2025 that gullies in Wheatley and Littleworth are about to be cleaned and jetted as part of a targeted gully program identified for early in the 2024/25 financial year.

The survey did identify that there is a 375mm surface water sewer draining an area from the south of the village towards the corner of Wren Close / Farm Close Road. At this manhole some smaller drains from around nearby properties and the parking area to the rear of the shops on the High Street are connected with the 375mm diameter outfall pipe draining to a manhole located in the rear garden of 94 High Street. At this point the surface water sewer increases to twin 375mm diameter pipes to drain through Crown Square to the watercourse. It was identified that a 300mm diameter Thames Water foul sewer drains through manhole 12 on Crown Square potentially restricting flow.

There are further highway sewers from Mulberry Drive connecting into the main drain run on Crown Square. Crown Square is a natural low point and upstream there is a significant catchment from south Wheatley draining towards the Wheatley Brook.

Pronounced flooding from a manhole in Crown Square occurred in 2008 and the same issue occurred again in September 2024. This is shown on the photograph in Figure 15. Whilst a survey of the culvert under High Street has not yet been undertaken, current mapping indicates that the culvert splits close to this location with a further connection likely from the north. There is also a 300mm foul sewer cutting

through one of the main manhole chambers. It is therefore likely that there is a blockage effect occurring with reduced capacity forcing water to flood out of the manhole. This effect has been assessed as part of the modelling and given the proximity of the open section of watercourse, does not manifest as a significant increase in flood risk as water drains back into the channel downstream.



Figure 15 - Flooding from manhole in Crown Square (Source; Wheatley Flood Group)

Area Rear of 66 – 72 High Street Shops and Farm Close Road area

The drainage investigation undertaken identifies that there is only a small 150mm link pipe from the parking area to the rear of the shops linking surface water to the network in Farm Close Road, which has limited capacity. Floodwater originating from the High Street therefore drained overland between High Street and Farm Close Road following the natural valley. It is understood that walls between gardens caused severe impediment to flow resulting in water levels increasing in some areas. Figure 16 includes drains identified in this area.

Apart from a few gullies with stuck lids, gully pots requiring maintenance in the Beech Close area upstream were cleaned in February 2025 by Oxfordshire Highways.



Figure 16 - Surface Water drainage network around Crown Square. (Contains Ordnance Survey data © Crown copyright and database right 2024 [1000018668].

Barlow Close / Littleworth Road

Survey investigation work by Oxfordshire Highways along the rear of 10a Barlow Close has identified a 225mm surface water sewer draining around the property into a small pond. The outfall pipe from this pond was found to be 100mm diameter and blocked approximately 10m along with the survey unable to confirm its outfall point, although it is believed that the pipe was jetted to a greater extent. A plan showing drains identified is included in Figure 17

When tracing sewers back through from the downstream area it was found that there was a surface water sewer located close to the point of blockage but not on the same line. There is also a ditch close by on the opposite side of nearby Littleworth Park.

It is recommended that the pipe owner review information from the survey and arrange for the blockage to be removed and / or system reconnected to the outfall pipe. It is noted that from a review of historic plans, this outfall pipe would appear to follow an old ditch line and therefore that responsibility for work would likely be with the associated landowner.

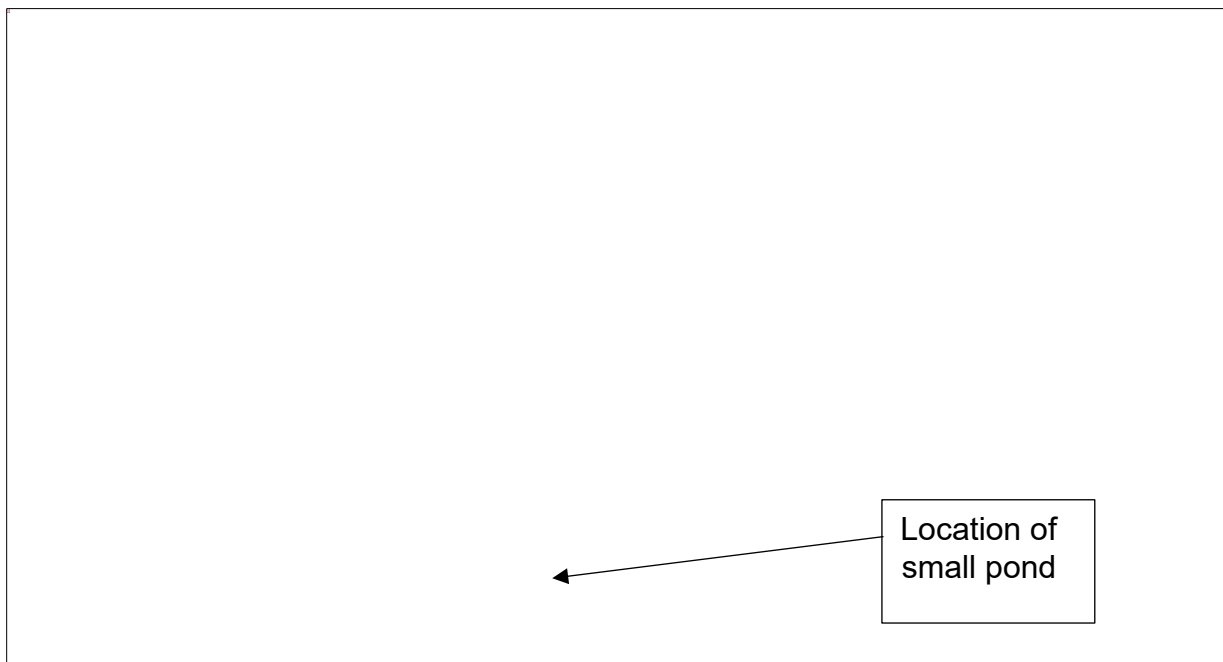


Figure 17 – Drainage network around Barlow Close / Littleworth Road (Contains Ordnance Survey data © Crown copyright and database right 2024 [1000018668].)

3. CONCLUSIONS

This investigation has reviewed flooding that occurred in Wheatley on 22nd / 23rd September 2024.

Flooding was caused by exceptionally heavy rainfall, with total rainfall above 120mm in 24 hrs. This was significantly above the monthly average and contributed to the wettest Oxfordshire September since records began.

This overwhelmed culverts and drainage infrastructure, and hydraulic analysis confirms that during the peak of the storm, flow in the main Wheatley Brook as it enters the centre of the village was more than 3 times the capacity of the culvert.

Flooding in risk areas of the village was therefore severe with water flooding overland along the natural low points affecting roads and properties.

Flooding also occurred from groundwater with a well near Crown Square reportedly overflowing with water draining into the open section of watercourse nearby.

Detailed survey of the watercourse to inform a wider study into potential flood mitigation measures has been completed and this has assisted with the production of a detailed hydraulic model which has been used to assess the existing fluvial network and its response to high flows.

Although exact numbers are not known, it is estimated that around 50 properties experienced internal flooding resulting in significant damage to property and belongings with some residents needing temporary accommodation. Businesses were affected in several locations including a nursery and commercial premises along High Street.

Following the event key drainage infrastructure has been investigated by Oxfordshire County Council and South Oxfordshire District Council and it is proposed to survey the main culvert, which will require a road closure given the location. The information identified to date has assisted with informing this investigation and the recommendations within.

There are several recommendations for further work to mitigate future flooding and these are detailed in Section 5 of this report.

4. RIGHTS AND RESPONSIBILITIES

4.1. Communities and Residents

Communities may consist of the Town or Parish Council, Flood Forum, Community Group and affected residents, amongst others.

Communities and residents who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected.

Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include [subscribing to MET Office email alerts](#) for weather warnings, nominating a Community Flood Warden, producing a community flood plan, implementing property level protection and moving valuable items to higher ground. Finally, individual households can create their own personal flood plans, such as collating important documents for quick removal from the property, torches, waterproof clothing etc.

Oxfordshire County Council has produced a number of flood guides covering various subjects, some of which relate to this type of flood incident. The relevant guides have been identified and are available at: www.oxfordshirefloodtoolkit.com

4.2. Lead Local Flood Authority (LLFA)

As stated within the introduction section, OCC as the LLFA has a responsibility to investigate flood incidents under Section 19 of the F&WMA.

The LLFA also has a responsibility to maintain a register of assets which have a significant effect on flooding from surface runoff, groundwater or ordinary watercourses (non-Main River) as detailed within Section 21 of the F&WMA. The register must contain a record about each structure or feature, including the ownership and state of repair. OCC is also required to keep a record of flooding hotspots across the county.

OCC's practices relating to third party assets is to notify third party owners of their asset forming part of a flood risk system, and assist by advising those third party owners on the condition of their assets and their maintenance responsibilities.

As Lead Local Flood Authority, OCC will be looking for support from other risk management authorities, communities and individual home owners to ensure flood incidents are reported, and any assets which have a significant effect on flood risk are recorded on the asset register.

While OCC can suggest possible causes of flooding, and make recommendations to ensure flood risk is mitigated as far as possible, the F&WMA does not provide OCC with the mandate or funding to act on identified causes of flooding or force risk management authorities to undertake any recommended actions.

4.3. Highway Authority (Oxfordshire Highways)

Oxfordshire Highways have a duty to maintain the highway under Section 41 of the Highway Act 1980 but subject to the special defence in Section 58.

New highway drainage systems are designed to Highways England's Design Manual for Roads and Bridges (Volume 4, Section 2). They are only required to be constructed to drain surface water runoff from within the highway catchment rather than from the wider catchment.

There are historic drainage systems in historic highways which can become the responsibility of the Highway Authority due to dedication, as opposed to adoption. These drainage systems may not have been designed to any standard.

Oxfordshire Highways undertake regular highway drainage cleansing. Identify and develop a detailed plan of their assets.

If flooding occurs OCC will assess the capacity of the highway assets and identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works should be considered.

Oxfordshire highways should assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities.

4.4. Water Authority - Thames Water Utilities (TW)

Water and sewerage companies are responsible for managing the risks of flooding from surface water, foul water or combined sewer systems. Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. However, in extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

Sewerage undertakers have a duty, under Section 94 of the Water Industry Act 1991, to provide sewers for the drainage of buildings and associated paved areas within property boundaries. Since the 1st October 2011 the majority of private sewers and lateral drains in England and Wales were transferred into public ownership, meaning they are now the responsibility of the relevant sewerage undertaker.

A public sewer is a conduit, normally a pipe that is vested in a Water and Sewerage Company or predecessor, that drains two or more properties and conveys foul, surface water or combined sewage from one point to another, and discharges via a positive outfall.

There is no automatic right of connection for other sources of drainage to the public sewer network. Connection is therefore discretionary following an application to connect.

4.5. South Oxfordshire District Council

District Councils have powers under Section 14 of the Land Drainage Act 1991 (LDA) to undertake flood risk management works on ordinary watercourses (non Main River) where deemed necessary.

Under Section 20 of the LDA, District Councils have the powers to (by agreement of any person and at that person's expense) carry out any drainage work which that person is entitled to carry out. Agreement may not be required in certain emergency or legally upheld situations.

South Oxfordshire District Council also has delegated authority from OCC/LLFA to serve notice on persons requiring them to carry out necessary works to maintain the flow of ordinary watercourses under Section 25 of the LDA and receives funding from the LLFA to do this.

The District Council is the Planning Authority and has a role in Building Control and the Building Regulations.

4.6. Environment Agency (EA)

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through national and strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery.

The EA also has operational responsibility for managing the risk of flooding from main rivers. Main rivers are usually larger river and streams and include all watercourses defined on the main river map which can be accessed at <https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/StatutoryMainRiverMap&Mode=spatial>

The responsibility for maintenance and repair of rivers lies with the riparian owner, but the EA have permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991 (WRA).

The EA encourage third party asset owners to maintain their property in appropriate condition and may take enforcement action on a prioritised basis where it is appropriate. They may also consider undertaking maintenance or repair of third party assets only where it can be justified in order to safeguard the public interest and where other options are not appropriate.

Further remit of the EA includes;

- preparing preliminary flood risk assessments and flood risk management plans for flooding from main rivers, reservoirs and the sea (Flood Risk Regulations 2009)

- warning and informing (Ministerial Direction to the National Rivers Authority, 1996)
- regulating activities that may affect the risk of flooding from main rivers (Environmental Permitting Regulations (England and Wales) Regulations 2016)
- Carrying out surveys and mapping (Flood Risk Regulations 2009, Water Resources Act 1991)
- reporting to the minister on flood and coastal erosion risk and how the national and local strategies are being applied by all of the authorities involved (FWMA, 2010)
- acting as a statutory consultee for planning authorities providing advice on planning applications, local plans and environmental assessments regarding flood risk from main rivers and the sea (Town and Country Planning (Development Management Procedure) (England) Order 2015)

4.7. Land Owners and Developers

Land owners are responsible for the drainage of their land and controlling any movement of sediment from their land. Legally, owners of lower-level ground have to accept natural land drainage from adjacent land at a higher level. The exception to this is where the owner of the higher level land has carried out “improvements” such that the runoff from the land cannot be considered “natural”.

Agricultural practices by land owners can be considered as “improvements” to the land, so that cultivation of crops or other land uses can take place. Mitigation works are required on improved land to account for the change in natural land drainage and changes to surface water runoff this can create.

Land owners and developers are responsible for working with the Local Planning Authority to ensure that their development is completed in accordance with the planning permission and all conditions that have been imposed.

Advice for developers is available on the Oxfordshire Flood Toolkit.

www.oxfordshirefloodtoolkit.com/planning/developers/

5. RECOMMENDATIONS

5.1. General

Listed below are the recommendations emanating from this formal Section 19 Flood Investigation Report. All the actions are initial recommendations that require discussing in detail to determine their feasibility.

It is important to note that it is for the relevant responsible body or persons to assess each recommendation in terms of the legal obligation, funding, resource implications, priority and cost/benefit analysis of undertaking such action.

The recommendations may be included within the action plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programmes, as appropriate.

Authorities should work together Look into funding opportunities to carry out the listed actions. There are multiple funding sources which could contribute to schemes and improvement works going forward. The majority schemes will require elements of partnership working and contributions to be successfully funded. They are likely to need to provide multiple benefits such as improving flood resilience whilst also managing water levels, reducing drought risks, helping nature recovery as well as climate adaptation.

There are several funding options available which can be explored through multi agency working groups such as,

- Flood & Coastal Erosion Risk Management (FCERM)
 - Flood Defence Grant in Aid (FDGiA)
 - Local Levy Regional Flood and Coastal Committee (RFCC)
- DEFRA Natural Flood Management Funding
- Woodland Creation Grants
- Agricultural & Environmental Schemes (Countryside Stewardship)
- Funding sources relating to development and regeneration, such as section 106 agreements, Community Infrastructure Levy (CIL) and New homes bonus
- Non-government organisations and charitable trusts
- Community fundraising and events
- Lotteries (Heritage Lottery Fund, Big Lottery, Arts Council)
- Volunteering
- Nature for Climate Fund
- Grants from other government departments, such as BEIS, MHCLG, DfT, DfE (for example, Flood Resilient Schools)
- UKRI – the research councils funding
- Business in the community
- Green recovery challenge fund
- Partnership funding (for example, contributions from partners, local authorities, businesses and communities etc.

5.2. Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
Complete Hydraulic Flood Modelling study and assessment (ongoing)	South Oxfordshire District Council Environment Agency	-Oxfordshire County Council (Resilience Team) Wheatley Parish Council Landowners Wheatley Flood Group
Assess flood alleviation proposals to reduce flood risk (ongoing) and prepare business case for approval by Environment Agency	South Oxfordshire District Council Environment Agency	-Oxfordshire County Council (Resilience Team) Wheatley Parish Council Landowners Wheatley Flood Group
Assess condition of key surface water sewers and main culvert	Oxfordshire Highways	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council
Review the frequency of maintenance of highway drainage assets, and look at increasing the frequency of cleansing in line with the current Countywide Highway Maintenance Programme and funding	Oxfordshire Highways	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council Wheatley Parish Council
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs.	Homeowners	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council
Riparian and drainage asset owners to clear blockages and repair / reconnect sections of drains identified as defective.	Riparian owners and drainage asset owners	-Oxfordshire County Council (Resilience Team) South Oxfordshire District Council

Refresh and improve community awareness, resilience and preparation for flooding, including production of community emergency plan	Community Flood Group and wardens	-Oxfordshire County Council (Resilience Team) -Vale of White Horse (Emergency Planner) - Oxfordshire County Council (Flood Risk Management Team)
Support community flood group and flood warden activities with additional training and materials.	Community Flood Group and wardens	-Oxfordshire County Council (Resilience Team) -Vale of White Horse (Emergency Planner) - Oxfordshire County Council (Flood Risk Management Team)

5.3. Communities and Residents

These include Town/Parish Council, Flood Forum, Community Group, land owners and affected residents.

Nominate a Community Flood Warden to help coordinate the following:

- Preparing Household Emergency Plans for vulnerable properties in this area.
- Regularly inspecting ditches and pipework in the area of flood risk. Report blockages or other issues to the land owner and the LLFA.
- Explore options for property level protection and implement any recommendations. This could include additional drainage at the rear of properties, self-sealing air bricks and flood barriers.

Information on Flood Prevention measures for Home Owners, Communities and Businesses can be found on the Flood Toolkit:

www.oxfordshirerefloodtoolkit.com/risk/prevention

Residents should check whether they are at risk of flooding by using the long term flood risk service www.gov.uk/check-long-term-flood-risk. If they are at risk of flooding they should sign up for flood warnings by visiting [sign up for flood warnings-gov.uk](http://sign-up-for-flood-warnings.gov.uk).

Permanent measures such as installing floodgates, raising electrical sockets and using flood resistant material when doing building work should be considered. South Oxfordshire District Council, Oxfordshire County Council and the Environment Agency can provide advice on these matters and more information can be found at: www.oxfordshirefloodtoolkit.com/emergency/preparation
<https://nationalfloodforum.org.uk/>

Explore community wide solutions (e.g. attenuation areas, overflow routes, tree planting). Use the Flood Toolkit Funding Tool to find sponsors who may be willing to help fund improvement projects: www.oxfordshirefloodtoolkit.com/risk/funding

Continue to report flood incidents to the Lead Local Flood Authority at: www.oxfordshirefloodtoolkit.com/emergency/report-flood. Endeavour to obtain as much evidence of flood events as possible, such as photographic and video evidence.

Residents to explore obtaining Government subsidised flood insurance via Can Flood Re help me? <https://www.floodre.co.uk/>

5.4. Lead Local Flood Authority (LLFA)

LLFA team to work with the Oxfordshire County Council Emergency Planning Team and the EA to set up and support a community based Flood Warden Network.

Assist the Oxfordshire County Council Emergency Planning Team, the EA and other flood management authorities to support the community in the production of a Community Flood Plan and provide advice to residents on how to explore options for property level protection.

Inform owners of the drainage systems and watercourses within the overall surface water catchment area of their legal responsibilities.

Re-establish the Agency flood group meetings to discuss problems and to look at strategies to combat flooding due to Climate Change. Have periodic meetings with the local flood group to discuss the issues and recommendations with representatives from key authorities.

Work with South Oxfordshire District Council in looking at opportunities for schemes to manage flows upstream such as nature based solutions through partnership working.

5.5. Highway Authority (Oxfordshire Highways)

Regularly check and maintain highway assets in line with their current maintenance regimes. Add detailed information of the assets to the OCC Asset Register.

Assess the capacity of the highway assets with support from the LLFA and South Oxfordshire District Council to identify any areas with insufficient capacity for

draining runoff from the highway. Where this leads to flood risk to properties improvement works must be considered.

Assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities. Work with the community and LLFA to clarify ownership and maintenance responsibilities for watercourses, particularly where these are located within or near to the highway.

5.6. Water Authority Thames Water Utilities (TW)

Assess the sources of water entering the public sewerage system. Foul sewers to be checked for surface water connections, blockages and capacity issues. Remedial works to be carried out as necessary to minimise surface water entering the system and increase capacity.

Assess the capacity of their assets and identify any areas of insufficient capacity. Where this leads to flood risk to properties improvement work must be considered.

Ensure the existing foul system is not compromised from future development proposals.

5.7. South Oxfordshire District Council

Continue to consult with the Environment Agency and Lead Local Flood Authority as required in respect of planning applications for new developments to reduce flood risk. Aim to ensure that all works are carried out in accordance with the approved plans and documents.

Review the planning policies relating to developments in the vicinity of the flooding incident, together with any flood risk assessments and drainage designs. Consider contacting the developers to take action in the event that any items relating to surface water drainage and flood risk are not evident or ineffective in the final developments or in the construction period.

Utilise their enforcement powers under Section 25 of the Land Drainage Act 1991 where it is considered that riparian owners are failing to maintain ordinary watercourses in their ownership.

Continue regular maintenance of their Ordinary watercourse Assets, in line with current maintenance regimes.

Endeavour to assist other flood risk management authorities and land owners in the preparation of a detailed plan of assets relating to drainage and flood risk, to share with the LLFA and the community.

Support landowners to investigate private drainage and check for blockages and defects with remedial works to be carried out where necessary.

Continue to support homeowners and businesses in providing individual property level protection.

5.8. Land Owners and Developers

Developers should work with local authorities to ensure all development is completed in accordance with approved plans and documents, and planning policy.

Land owners should undertake regular inspection and maintenance of their drainage systems in accordance with a defined maintenance regime. Further, they should identify and develop a detailed plan of their assets to share with the LLFA, other flood risk management authorities and the community.

Land owners should assess the capacity of their drainage systems and identify any areas with insufficient capacity for the collection, conveyance, storage and disposal of surface water. Where this could lead to runoff to the public highway or nuisance to third party private property, improvement works should be considered.

Landowners who are riparian owners are responsible for carrying out work to maintain the natural flow of water in the relevant watercourse. Such work will include the removal of significant blockages and the removal of vegetation if it is causing premature flooding to third party land and or property.

Review the library of flood guides on the Oxfordshire Flood Toolkit.

Agricultural land owners should carry out works to their land to reduce surface water runoff. These include following principles of good soil husbandry and providing land drainage systems such as ditches (**Error! Hyperlink reference not valid.**<https://www.gov.uk/guidance/create-and-use-a-soil-management-plan>).

These works help to retain the natural land drainage regime and provide the best soil conditions for the continued agricultural use of the land. Examples of good practice for reducing surface water runoff from agricultural land are:

- Ploughing fields in a perpendicular direction to the slope of the land, reducing the effect of channelling of water over the land when it rains
- Using techniques and machinery to limit compaction of soils
- Growing crops that match the capability of the land, particularly in relation to the timings of activities and not overworking soils through the year
- Providing new ditches, sub-soil drainage and outfalls, and reinstating and regularly maintaining existing ditches. Old existing ditches may be completely filled and difficult to see. The type of soil make-up, type of flora and overall lie of the land can help to determine the routes of filled in historic ditches
- Preventing changes to the levels of the land that would cause channelling of surface water to a single point where this would not naturally occur.

It should be noted that following good practice for managing surface water runoff cannot completely remove the risks of natural land drainage and the associated quantities and flow routes of runoff that can cause flooding.

6. DISCLAIMER

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

Any recommended actions outlined in this FIR will be for the relevant responsible body or persons to assess in terms of resource implications, priority and cost/benefit analysis of the proposal. Moving forward, these may be included in the Action Plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programme as appropriate.

The opinions, conclusions and any recommendations in this Report are based on information provided to South Oxfordshire District Council and Oxfordshire County Council.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and South Oxfordshire District Council and Oxfordshire County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the information in this report highlighting flooding to properties at a street level.

South Oxfordshire District Council or Oxfordshire County Council do not accept any liability for the use of this report or its contents by any third party.

ACRONYMS

SODC South Oxfordshire District Council
OCC Oxfordshire County Council
EA Environment Agency
TW Thames Water
FIR Flood Investigation Report
F&WMA Flood and Water Management Act 2010
LDA Land Drainage Act 1991
LLFA Lead Local Flood Authority
WRA Water Resources Act 1991

USEFUL LINKS

Highways Act 1980:

www.legislation.gov.uk/ukpga/1980/66/contents

Water Resources Act 1991:

www.legislation.gov.uk/ukpga/1991/57/contents

Land Drainage Act 1991:

www.legislation.gov.uk/ukpga/1991/59/contents

EA - Prepare your Property for Flooding:

How to reduce flood damage Flood protection products and services

www.gov.uk/government/publications/prepare-your-property-for-flooding

EA - Long term flood risk service:

<https://www.gov.uk/check-long-term-flood-risk>

EA - Sign up for flood warnings:

Error! Hyperlink reference not valid.

EA - Up to date information on flood alerts & warnings:

Error! Hyperlink reference not valid.

Oxfordshire County Council Flood and Water Management Web Pages:

www.oxfordshirefloodtoolkit.com

<https://www.oxfordshire.gov.uk/residents/fire-and-public-safety/emergency-planning/community-resilience>

Flood and Water Management Act 2010

<http://www.legislation.gov.uk/ukpga/2010/29/contents>

USEFUL CONTACTS

Oxfordshire County Council Highways:

Tel: 0345 310 1111

Website: www.fixmystreet.oxfordshire.gov.uk

Environment Agency:

General Tel: 08708 506 506 (Mon-Fri 8-6) Call charges

apply. Incident Hotline: 0800 807060 (24 hrs)

Floodline: 0345 988 1188

Email: enquiries@environment-agency.gov.uk

Thames Water

Emergency Tel: 0800 316 9800 (select option 1)




Website: www.thameswater.co.uk/help-and-advice/bursts-and-leaks/report-a-leak-orburst-pipe

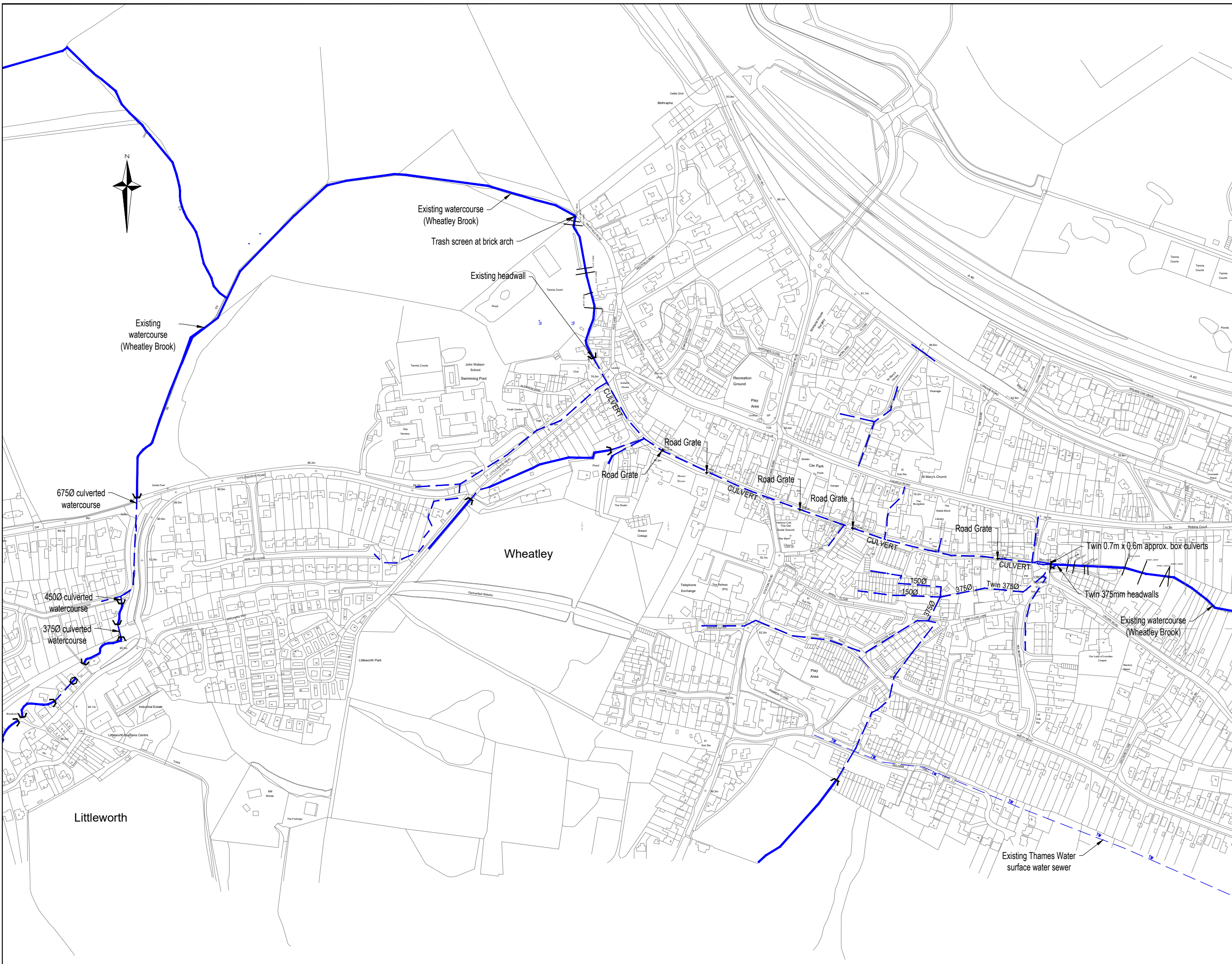
Appendix A – Existing Drains and Watercourses Plan

NOTES

1. This drawing to be read in conjunction with all relevant documents and specifications.
2. Dimensions not to be scaled.
3. Drainage routes shown are from historic records and no guarantee can be given to the accuracy of the information presented.
4. The background mapping is licensed and subject to Crown copyright and database rights 2024 OS [1000018668].

KEY

-  Existing Surface Water Sewer (from records)
-  Existing Watercourse
-  Existing Headwall



PROJECT :	
WHEATLEY S19 FLOOD INVESTIGATION	
TITLE :	
EXISTING DRAINS AND WATERCOURSES	
Project Engineer :	D. Bell
Scale :	1:2000 @ A1
Project Manager :	J. Backley
Date :	April 2025
Status :	INFORMATION
Drawing No.	4501 / 003

Rev	Description	Date	Chkd