Section 19 Flood Investigation

Flooding 2020 Snitterfield, Stratford Upon Avon

Warwickshire County Council as Lead Local Flood Authority

Version	Date	Issued to
Version 1: Draft	27.10.21	Flood Risk Management Team
Version 2 :Draft	12.11.21	Flood Risk Management Team & Partners
Version 2.1 Final	21.10.22	

CONTENTS

1 EXECUTIVE SUMMARY

Parts of Warwickshire experienced a period of isolated heavy rainfall on the 16th August 2020 resulting in internal flooding to property and businesses from surface water county wide. This resulted in at least 6 properties internally flooded due to surface water, whilst others experienced foul flooding and restricted toilet use. Internal property flooding was also experienced elsewhere in the county but has not at this time met the threshold for formal investigation identified in Warwickshire County Councils (WCC) Local Flood Risk Management Strategy (LFRMS).

As required by Section 19 of the Flood & Water Management Act 2010, Warwickshire County Council as Lead Local Flood Authority (LLFA) has a duty to investigate flooding where the appropriate thresholds have been met. Our thresholds for investigation are outlined in our LRFMS and have triggered the requirement for this report at 1 location.

In the recovery phase that followed, WCC worked with the Environment Agency, Severn Trent Water, WCC Highways and the Snitterfield Village Flood Group, to provide advice and guidance, advise on remedial works where required and to investigate the drained network. Whilst considerable work has already taken place, parts of the remedial works required are still ongoing.

2 INTRODUCTION

2.1 The requirement to undertake this report

Section 19 of the Flood & Water Management Act 2010 (FWMA) requires that the Lead Local Flood Authority (LLFA) undertake an investigation (to the extent that it considers it necessary or appropriate) upon becoming aware of flooding in its area.

The role of the LLFA in Warwickshire is carried out by the Flood Risk Management team at Warwickshire County Council (WCC).

The flood investigation must also determine the risk management authorities (RMAs) that have relevant flood risk management functions and whether each of those authorities have exercised or is proposing to exercise those functions in response to the flood. See Appendix I for the responsibilities of the various RMAs involved in this flood event.

Warwickshire County Council's Surface Water Management Plan (SWMP) identifies the thresholds that will apply when determining whether an investigation under Section 19 of the FWMA is required. These thresholds are as follows:

1. Flooding that poses a threat to the safety of the public or may directly result in serious injury or death
2. Five or more residential properties internally flooded
3. Two or more commercial properties internally flooded
4. One or more piece of critical infrastructure affected that impact on the wider area
5. Flooding that places vulnerable individuals or vulnerable communities at risk e.g. hospitals, care and nursing homes, schools, etc.
6. Where one or more residential properties have flooded internally from the same source on five or more occasions within the last five years

2.2 Scope of this report

This report summarises the completed and ongoing investigations carried out by risk management authorities into the flooding which occurred on August 12th 2020, in Snitterfield.

This report does not obligate the LLFA or other risk management authorities into resolving the flooding issues investigated herein, nor is it possible for the LLFA to impose others to undertake any of the recommended actions.

2.3 Disclaimer

This report has been prepared as part of WCC's responsibilities under the FWMA. 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.

The opinions, conclusions and any recommendations in this report are based on assumptions made by WCC when preparing this report including reliance on information provided by others.

WCC expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect. The opinions, conclusions and any recommended actions in this report are based on conditions encountered and information reviewed at the time of preparation and WCC expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommended actions.

The information in this report is provided "as is" and no warranties, promises, and/or representations of any kind, expressed or implied, are given as to the nature, standard, accuracy, or otherwise of the information provided in this report nor to the suitability or otherwise of the information to your particular circumstances.

WCC does not accept any liability of any nature and howsoever arising for the use of this report or its contents by any third party. WCC shall not be liable for any loss or damage of whatever nature (direct, indirect, consequential, or other) which may arise as a result of the use of this report by a third party.

Nothing in this legal disclaimer will limit any of our liabilities in any way that is not permitted under applicable law or exclude any of our liabilities that may not be excluded under applicable law.

3 WEATHER AND FLOOD INFORMATION

3.1 Weather and flood warnings

The UK experienced extremely hot weather with temperatures in Southern England reaching 35 degrees on the 11th & 12th of August 2020. A Public Health warning was issued due to the heat experienced during the week of the 11th of August and into the week of the 17th of August. A thunderstorm warning was in force for parts of England and Wales throughout the week of this flood event. Thunderstorms in the UK are often associated with breakdown following hot and humid weather with torrential downpours accompanied by hail and lightning strikes. The thunderstorms were caused by hot humid air resulting from the heatwave being experienced.

Warnings were issued for isolated surface water flooding by the Flood Forecasting Centre, characterised as having the potential for significant impacts and a low likelihood of occurrence. The rainfall for the event on the 12th of August was highly localised due to the convection experienced during thunderstorm activity and resulted only in localised highway flooding in Snitterfield.

Rainfall radar data for Snitterfield obtained through Hydromaster, records that during the period of the 16 August 2020, that a daily rainfall total of 23.6mm fell. Peak rainfall rates were observed between 17:00 and 19:00hrs and correlate with the period of flooding reported.

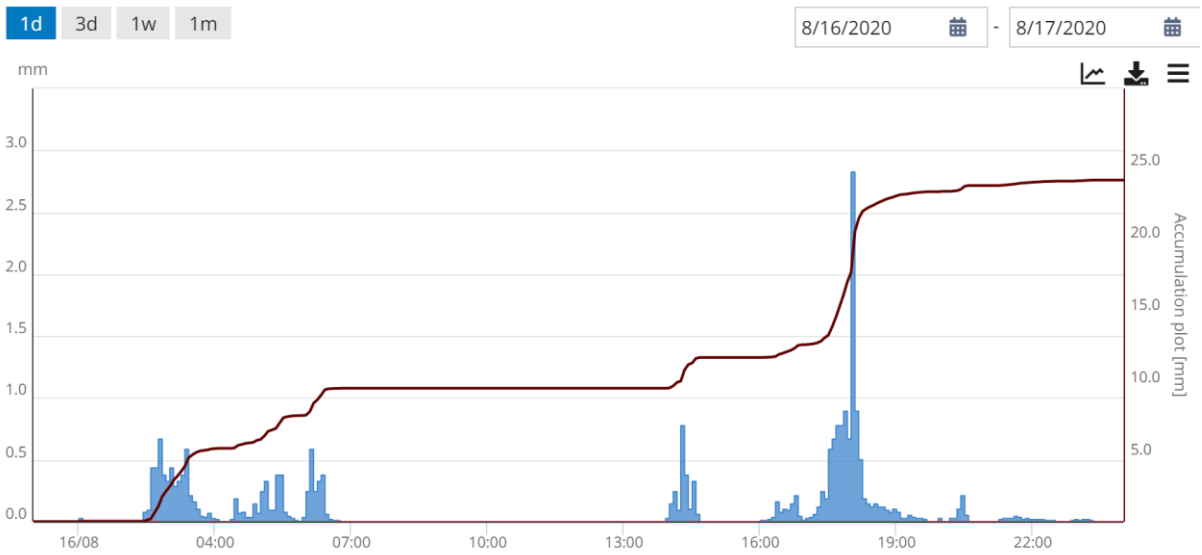


Figure 1, rainfall accumulations, source Hydromaster, data DTN

Anecdotal reports collated on the 17 August 2020 suggested that the intensity of rainfall was such that numerous properties in the village of Snitterfield experience ingress through the fabric of the building not associated with any flooding mechanisms. This supports wider reports from Snitterfield and the surrounding settlements of a short period of localised intense rainfall. Peak intensity of the event is recorded at 17.5mm/h, with a total daily rainfall recorded at 22.63mm, suggesting a return period for the event of under two years. An average rainfall across the Snitterfield parish geography does suggest a higher return period event of between five and ten years.

During the event of August 12th, similar flooding was reported within Warwick with 10-20mm rainfall intensity being experienced with further intensity shown close by of 20-30mm and 30-40mm. Given the highly localised rainfall associated with an event of this nature, it is therefore conceivable that in the absence of a local rain gauge, that the true intensities may have been higher.

During the event it was noted that Bell Brook, which flows west to east through Snitterfield, did not exert a significant response, with all flows being contained within the channel profile. Fluvial flooding is not believed to have been a mechanism in flooding experienced.

4 INVESTIGATION SUMMARY

4.1 Locations included in the investigation

The details in this investigation relate only to flooding experienced at Snitterfield. Only one other location is believed to have met the threshold for formal investigation during this period, being Warwick and subject to a separate S.19 report.

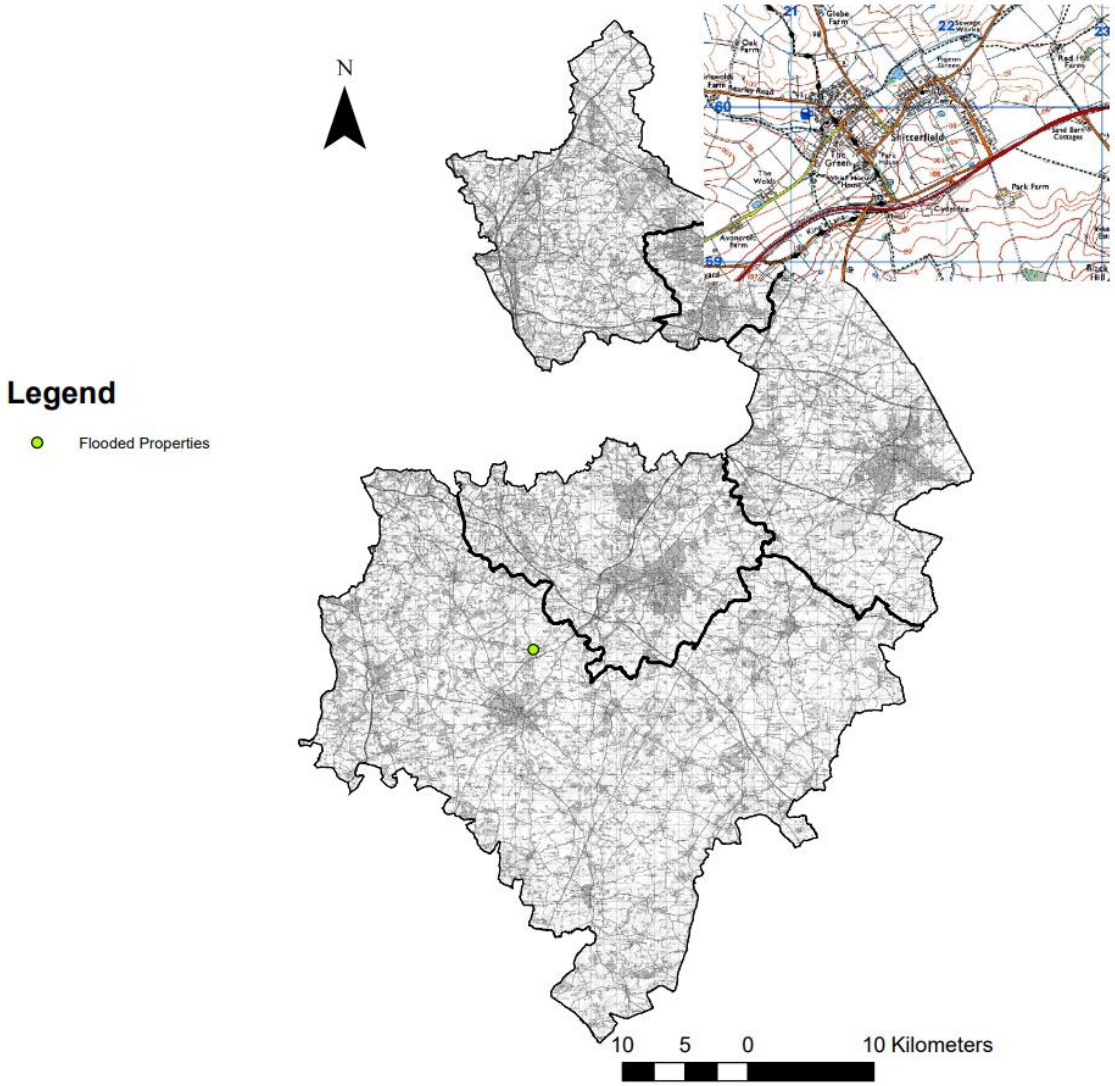


Figure 3: Map of Warwickshire and District/borough boundaries showing locations of investigation.

5 KEY CONCLUSIONS OF THE INVESTIGATION

5.1 Source of flooding

The flood impacts from the rain which fell in the Snitterfield area of Stratford Upon Avon during this event was characterised by short duration high intensity rainfall. The majority of the rainfall fell within a 2 hour 45 minute window, with short lived periods of up to 17.5mm/hr high intensities recorded within this window.

No significant fluvial response was reported during this event and flooding observed resulted instead from surface water flows and the inundation of artificial draining networks, such as sewers. Where surface water flows were present, many of the resulting flow routes have exploited the built environment, such as highways and hardscaped gardens, with the resulting effect of channelling water and inhibiting infiltration and were evidenced by the large amounts of silt washed onto the highway and observed post incident. Flooding was reported in three mains areas within Snitterfield, which are detailed below:

Duffins Piece

Rainfall resulted in the overtopping of a small unnamed ordinary watercourse, the resulting flows then exploited the public right of way and flowing westward before entering Duffins Piece. Duffins Piece is a private tarmacked access road, which serves to access the land and properties, and has no formalised drainage infrastructure to drain the road surface. As many of the properties at this location have thresholds comparable to, or lower than the adjacent private highway, the resulting flows led to the internal flooding of two properties. An amount of flow is believed to have also propagated within the arable land above, flowing through the gated field access. Videos taken at the time suggest that the flows resulting from the overtopping of the ordinary watercourse were the more significant contributory factor.

Figure 4 shows the EA surface water extent mapping for Duffins Piece. This does not accurately represent the flow routes reported during the event of 16th August 2020.

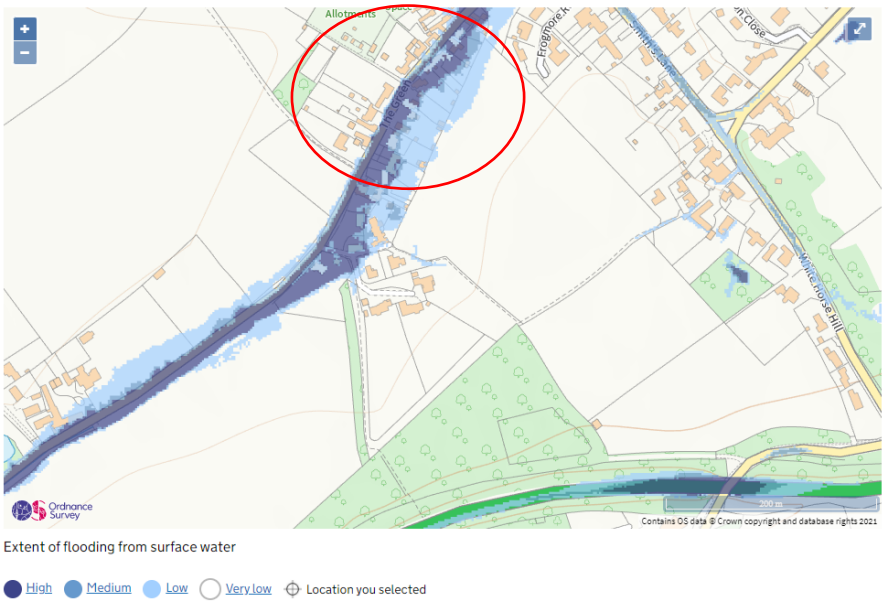


Figure 4, Source EA

The Green

Surface water flows propagating in the higher land to the west flowed towards properties on The Green resulting in low level accumulations through a flag stone floor. Conversations had post event with the residents were inconclusive as to whether the flooding resulted directly from these flow routes, or a localised rising of the water table. As the property sits above the level of the highway and away from any watercourses, these are not believed to have been a factor in the resulting flooding.

Figure 5 shows the EA surface water extent mapping for The Green. This does not accurately represent the flow routes reported during the event of 16th August 2020.

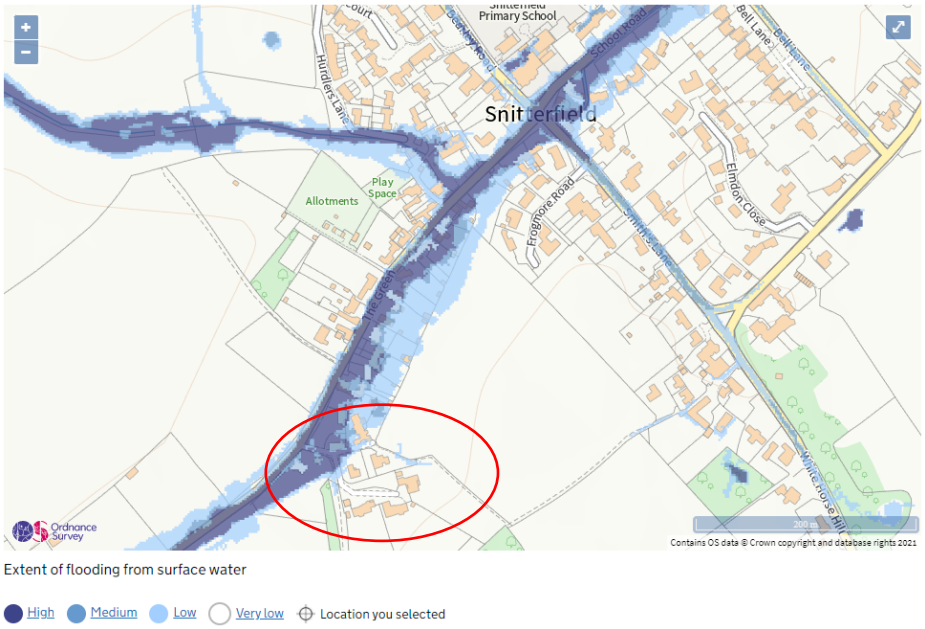


Figure 5, Source EA

School Road

Surface water flows propagating in higher agricultural land and private estate exploited the topography of the land and overwhelmed the existing drainage infrastructure causing a number of chambers to surcharge. The high level of impermeable surfaces in this area, will have inhibited infiltration and provided an impermeable surface over which flows could propagate.

Figure 6 shows the EA surface water extent mapping for School Road. The flow routes from Hales Close/Duttons Close are consistent with reports from residents at the time, and are believed to have been a significant contributing factor to the reported flooding.

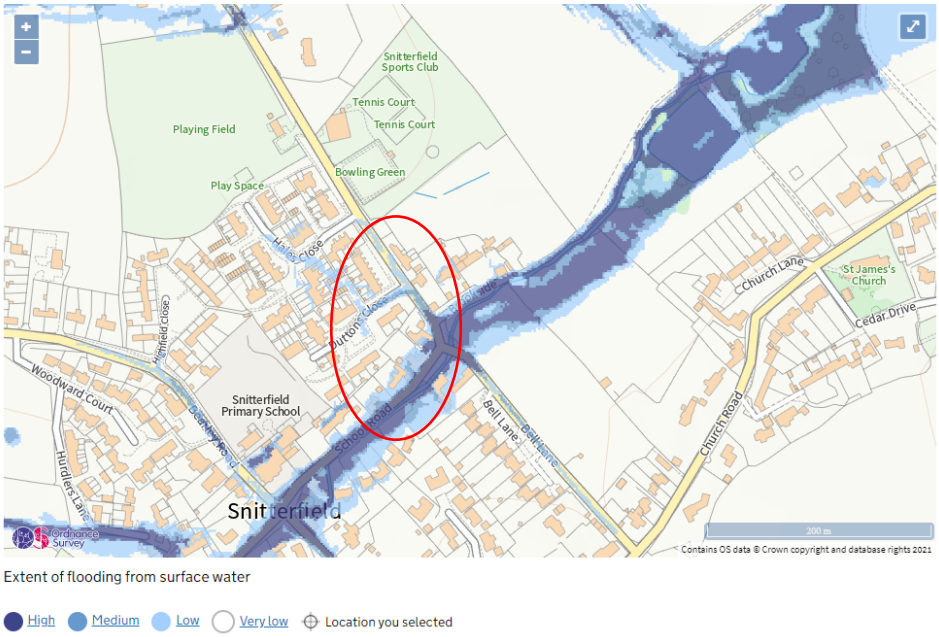


Figure 6, Source EA

5.2 Gathering data for the investigation

In the immediate aftermath of the flood events, officers from WCC and the Environment Agency attended this location to provide advice and to better understand the flooding mechanisms. Frequent meetings have been held with the Snitterfield community flood group to discuss ongoing issues, and has representatives from the Parish Council, Severn Trent Water (STW), Environment Agency (EA), WCC Highways and WCC Flood Risk Management (FRM).

5.3 Summary of investigations

Duffins Piece

The watercourse has been inspected and found to be lacking a defined enough profile to sufficiently convey flows in places. Additional options to install a new drain on Duffins Peace have been explored, but have been discounted at this stage due to complications around future maintenance. Presently ecologists are being consulted to understand what constraints there might be to undertaking desirable works to the watercourse on an without prejudice basis.

The Green

No known failures have been identified associated with existing land drainage features or any artificial drainage infrastructure.

School Lane

CCTV and jetting surveys of the artificial drainage network have been undertaken by WCC Highways and STW, with regular updates given at the Snitterfield flood group multi agency meetings, though some investigation remains outstanding.

Further modelling is being discussed with the Environment Agency to understand the significance of downstream structures within the main river. These are not believed to have played a role during the event of 16th August 2020, but should be considered as part of the broader context of future flood risk at this location.

6 APPENDICES A-F: LOCATION REPORTS

Appendix A: Duffins Piece Location
Appendix B: Duffins Piece Actions and Opportunities
Appendix C: The Green Location
Appendix D: The Green Actions and Opportunities
Appendix E: School Lane Location
Appendix F: School Lane Actions and Opportunities

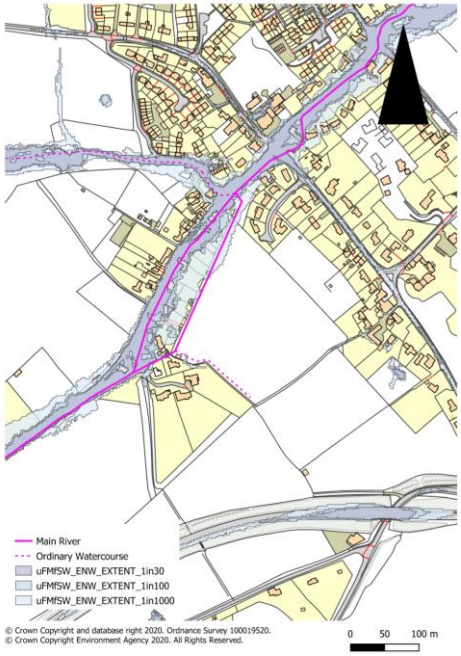
Duffins Piece, Snitterfield

What was affected?

Properties internally flooded	2
Properties externally flooded	0
Critical Infrastructure flooded	0

Source of flooding

Surface water	✓
Sewers	✗
Main river	✗
Ordinary watercourse	✓
Other	✗



Source: Environment Agency (Risk of Flooding from Surface Water, main river mapping). Note this is modelled information indicative of the main risk areas. It does not indicate the areas that flooded in August 2020. Darker blues indicate higher risk.

How does the existing system operate?

The village of Snitterfield is located about 3 miles north of Stratford-upon-Avon.

Duffins Piece is an area of unadopted highway which serves as access for a small number of properties and associated agricultural land. The is no associated positive drainage associated with this unadopted highway, however the bypass channel associated with the Bell Brook Joint WCC and EA scheme flows beneath. A small ordinary watercourse flows within the boundary of the agricultural land and public right of way. This is culverted at its northerly extend and flows taken by the newly constructed bypass system.

As part of the Bell Brook works, this associated agricultural land was reprofiled to provide protection against any resulting surface water flows that may propagate within this agricultural land.

What happened here on 16th August 2020?

Two distinct surface water flows were noted to have occurred during this event. The primary flow route created by flows coming out of bank from the ordinary watercourse and flowing down the area designated as a public right of way onto Duffins Piece. The Secondary flow route being overland flows generated within the higher agricultural land breaching the raised vehicle access and entering Duffins Piece through the gated access to the field. It is believed that overland flow routes formed not due to a result of a failure in the receiving infrastructure, but were a result of the intensity of rainfall and failures in the morphology of the channel.

An inspection of the ordinary watercourse identified that much of the original profile had been lost, with many self set trees and saplings now occupying the channel profile. It is likely that significant vegetation and tree removal would be required to undertake proactive maintenance.

The resulting flows entered two properties on Duffins Piece, where the threshold levels were lower than or comparable to the hight of the unadopted highway.

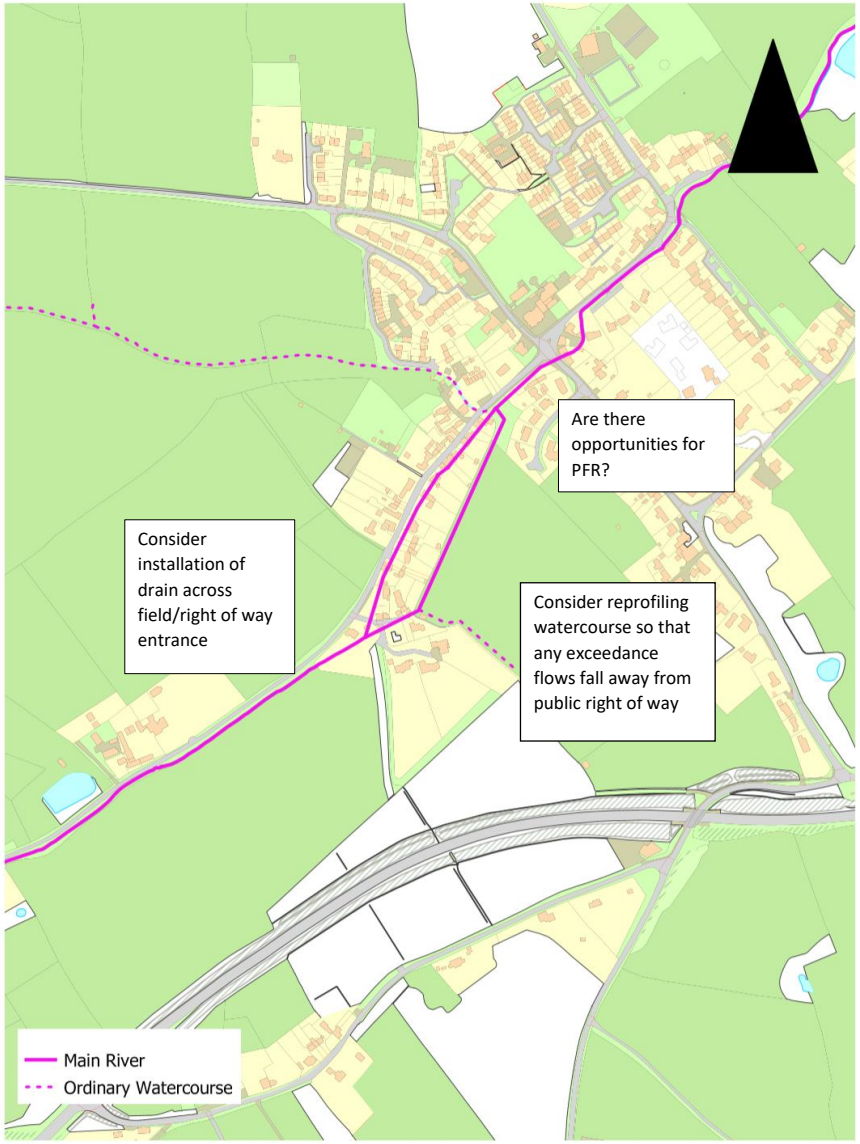
Is there a history of flooding in this location?

Flooding to properties has been reported in Snitterfield in 1998, 2007, 2012, 2016, 2019 and 2020. These events will include both fluvially and surface water driven events. The most significant impacts of flooding are associated with the School Lane and The Green areas. Smaller scale events have occurred between these dates, however flooding is believed to have been confined to low lying land and the highway. There is no record of internal flooding to properties on Duffins Piece prior to August 2020.

What actions are being taken?

No.	Action	Responsible party	Progress
1	Undertake appropriate channel maintenance	Landowner	Not yet instigated
2	Consider if desirable works can be undertaken to ordinary watercourse by LLFA. Works likely to include regrading of channel and reprofiling of surrounding land.	LLFA	Ongoing
3	Work with local flood group to explore options for maintenance and mitigation	WCC FRM	Ongoing

What are the future opportunities that may reduce flood risk in this location?



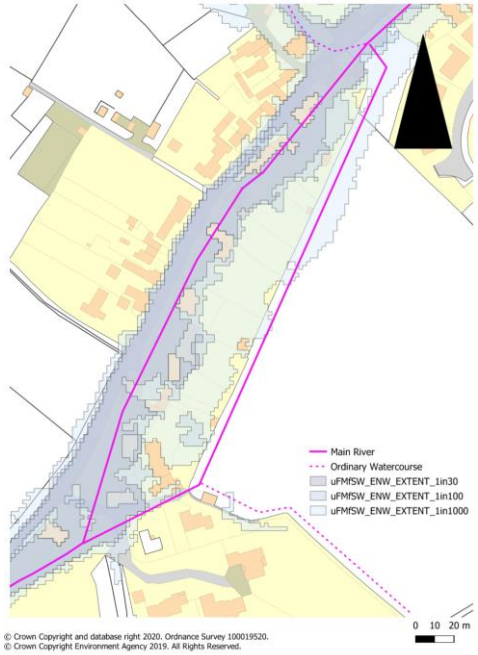
The Green Snitterfield

What was affected?

Properties internally flooded	1
Properties externally flooded	2+
Critical Infrastructure flooded	0

Source of flooding

Surface water	✓
Sewers	✗
Main river	✗
Ordinary watercourse	✗
Other	✓



Source: Environment Agency (Risk of Flooding from Surface Water, main river mapping). Note this is modelled information indicative of the main risk areas. It does not indicate the areas that flooded during the event of August 2020. Darker blues indicate higher risk.

How does the existing system operate?

The village of Snitterfield is located about 3 miles north of Stratford-upon-Avon.

Gullies located within the highway on The Green Discharge to the culverted watercourse flowing along its length, however as this network is not felt to have contributed to internal property flooding at this location, further details are not included.

The Green in Snitterfield has a history of flooding and recently received significant capital funding to bypass the existing aged system through land lying to the South, before returning to its original course further down the Green. As these works are not believed to have been a contributory factor at this location during this event further details are not included.

What happened here on 16th August 2020?

A yellow warning for isolated significant surface water and river flooding was in place on the 16th August 2020 and was characterised by significant localised accumulations. One such rainfall event occurred in the village of Snitterfield and may have extended as far as neighbouring villages such as Norton Lindsay.

Post event WCC and the EA attended site to gather further information on the flooding. Anecdotal reports suggest a significant surface flow routes within the vicinity, entering the highway from the surrounding higher land.

One property is known to have suffered from low level internal flooding at this location. Reports suggest that the water table rose and entered said property through its flagstone floor. Given the age of the property and construction techniques used in the floors construction, it is felt that the flag stone floor would present a likely weak spot for ingress to occur. An amount of surface water flooding was also reported coming from the higher agricultural land to the north east behind the properties. Post event investigations have been unsuccessful in establishing the precise mode of flooding. Reports have also been received of highway and garden flooding in the vicinity during the August 2020 event, the property reported to have internally flooded sits elevated above the highway and any impediment within the highway drainage network is unlikely to be a causal factor during this event. The reports of external property and garden flooding received, resulted as a consequence of the surface water flows accumulating on impermeable areas such as driveways, the highway and from the surface run off from the higher agricultural land situated to the north east of The Green.

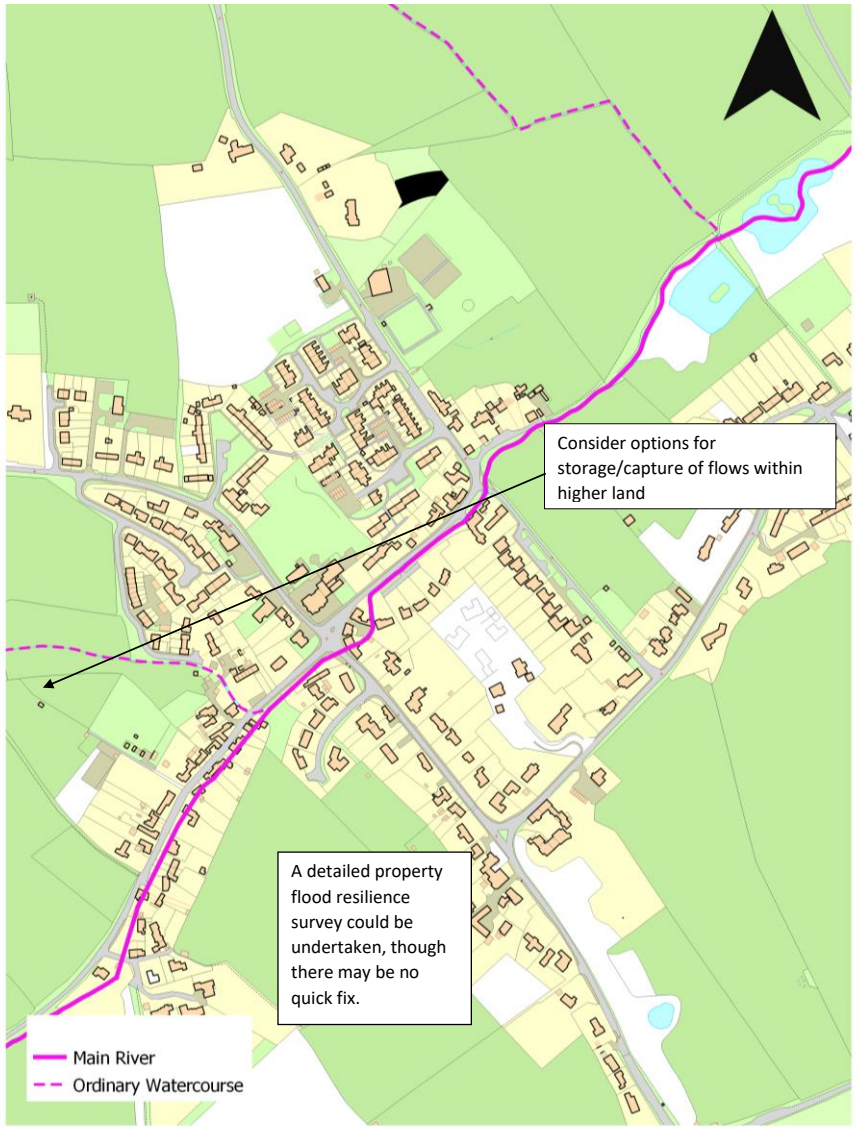
Is there a history of flooding in this location?

Flooding to properties has been reported in Snitterfield in 1998, 2007, 2012, 2016, 2019 and 2020. These events will include both fluvially and surface water driven events. The most significant impacts of flooding are associated with the School Lane and The Green areas. Smaller scale events have occurred between these dates, however flooding is believed to have been confined to low lying land and the highway.

What actions are being taken?

No.	Action	Responsible party	Progress
1	Ensure that highway cyclic gully cleansing is scheduled at an appropriate interval on School Lane	WCC Highways	Ongoing
2	Work with local flood group to explore options for maintenance and mitigation	WCC FRM	Ongoing
3	Explore options for Property Flood Resilience (PFR) interventions, though it is noted that the construction of the affected property may limit opportunities.	Homeowner	
4			
5			
6			
7			

What are the future opportunities that may reduce flood risk in this location?



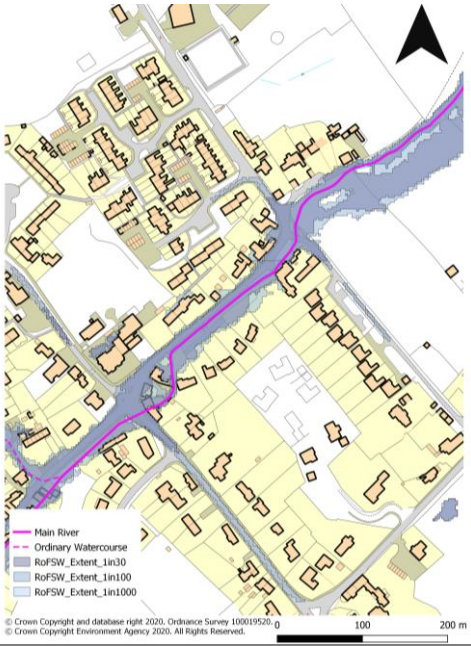
School Road Snitterfield

What was affected?

Properties internally flooded	6
Properties externally flooded	2
Critical Infrastructure flooded	0

Source of flooding

Surface water	✓
Sewers	✓
Main river	✗
Ordinary watercourse	✗
Other	✗



Source: Environment Agency (Risk of Flooding from Surface Water, main river mapping). Note this is modelled information indicative of the main risk areas. It does not indicate the areas that flooded during the event of August 2020. Darker blues indicate higher risk.

How does the existing system operate?

The village of Snitterfield is located about 3 miles north of Stratford-upon-Avon.

All the gullies sited at the junction of School Road, Wolverton Road and Bell Lane discharge into an access chamber positioned outside of Brook Barn. From here, there is a 300 mm diameter pipe which connects to an access chamber adjacent to the Bell Brook. There is an outlet from this access chamber to the Bell Brook which has a gate flap arrangement to prevent water flowing from the Bell Brook back up the system.

What happened here on 16th August 2020?

A yellow warning for isolated significant surface water and river flooding was in place on the 16th August 2020 and was characterised by significant localised accumulations. One such rainfall event occurred in the village of Snitterfield and may have extended as far as neighbouring villages such as Norton Lindsay.

During this event surface water flows were generated which were unable to enter or exceeded the capacity of the existing drainage infrastructure. It is noted that whilst the levels in Bell Brook rose significantly, no flows escaped out of bank at this location during the event. Whilst the highway drainage network drains to Bell Brook by means of a gate valve, the functionality of this feature is felt to be insignificant in this event as the level of flows experienced would have been beyond the design capacity of the highway system. However as concerns have been raised with respect to the flapped outfall, this we be addressed in the recommendations section of this report.

Post event WCC and the EA attended site to gather further information on the flooding. Anecdotal reports suggest a significant surface flow route to the north of School Road from the Hales Close and Duttons Close areas, along with reports of significant accumulations within gardens and surcharge from the existing private drainage network serving these areas on Duttons Close. This flow route is believed to have been a major contributary factor in the flooding of at least 3 of the 6 properties.

3 of the 6 properties flooded at this location have reported foul flooding mixed with surface water flows and a further 2 experiencing solely foul surcharge within the dwellings. It is likely that surface water entering the foul network at this location has caused a hydraulic issue resulting in the reported foul flooding.

Flood accumulations were also reported to have accumulated on the highway at School Lane, these have exploited the topography of the land and contributed to flooding along with the previously discussed sources. The impact of traffic and bow waves may have exacerbated the issue and forced flows towards and into properties.

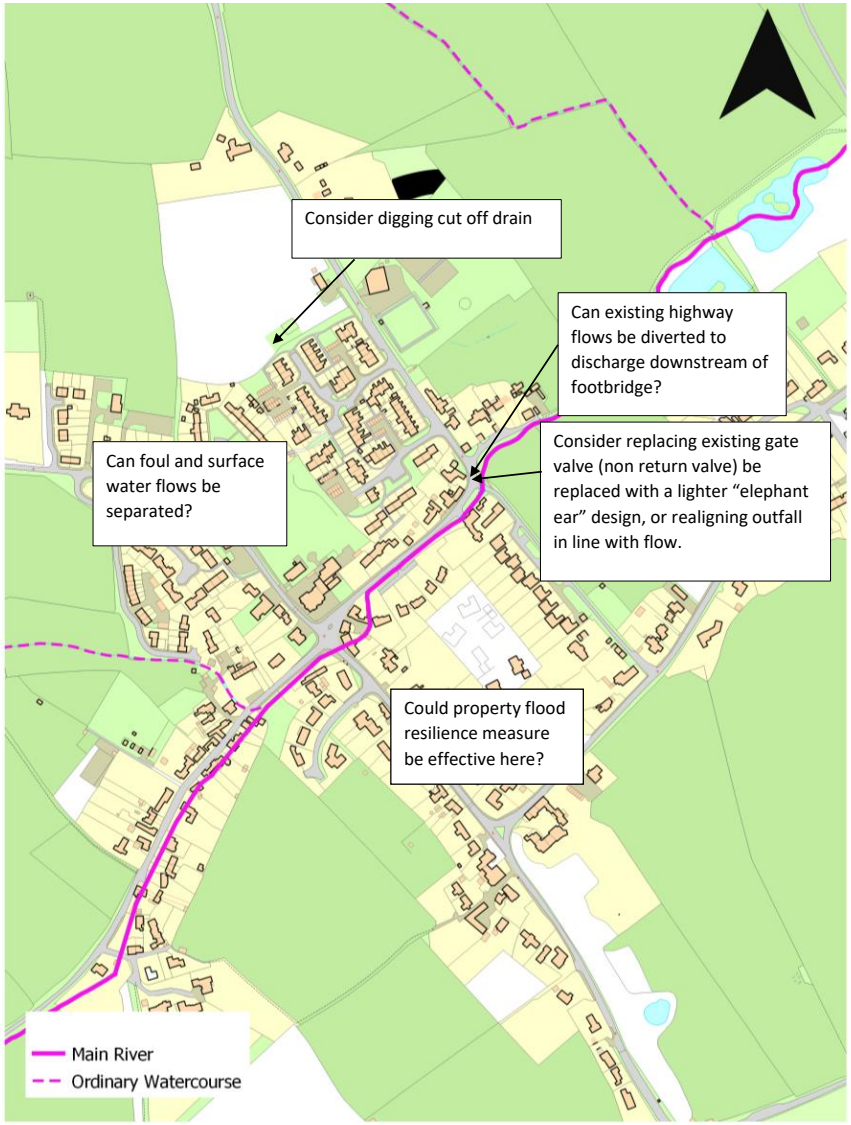
Is there a history of flooding in this location?

Flooding to properties has been reported in Snitterfield in 1998, 2007, 2012, 2016, 2019 and 2020. These events will include both fluvially and surface water driven events. The most significant impacts of flooding are associated with the School Lane and The Green areas. Smaller scale events have occurred between these dates, however flooding is believed to have been confined to low lying land and the highway.

What actions are being taken?

No.	Action	Responsible party	Progress
1	Ensure that highway cyclic gully cleansing is scheduled at an appropriate interval on School Lane	WCC Highways	Ongoing
2	Carry out a CCTV Survey from manhole 3801 down towards manhole 4001 in the vicinity of the primary school and School Road to investigate foul drainage issues	STW	Complete
3	Progress with works to carry out a modelling exercise of the Bell Brook from Smith's Lane to downstream of the two ponds east of Snitterfield	EA	Ongoing
4	WCC LLFA to work with residents group to discuss future maintenance of ditches	WCC LLFA	Ongoing
5	Severn Trent Water to consider whether options exist to reduce the risk of sewer flooding here in the future.	STW	Ongoing
6	Investigate existing drainage at Duttons Close and Hales Close	Various – STW investigating on a no prejudice basis	Ongoing

What are the future opportunities that may reduce flood risk in this location?



7 APPENDIX G – GLOSSARY OF TERMS

Critical infrastructure	Infrastructure which is considered vital or indispensable to society, the economy, public health or the environment, and where the failure or destruction would have large impact. Examples include hospitals, communications, electricity sub-stations, water treatment works, transport infrastructure and reservoirs.
Department for Environment, Food and Rural Affairs (Defra)	The government department responsible for policy and regulations on environmental, food and rural issues. This includes all aspects of flood risk management.
Environment Agency (EA)	See Appendix H.
External flooding	Flooding of areas of property that are not under the definition of internal flooding. Examples include gardens, driveways, parking areas and outbuildings such as sheds and garages.
Flood Risk Management (FRM)	FRM aims to reduce the likelihood and/or the impact of floods. This typically includes the following elements: prevention, protection, preparedness, response and recovery. In the context of this report, FRM also refers to the team at WCC which undertakes the LLFA role.
Exceedance flows	Excess surface water flow that occurs when the capacity of the drainage system is exceeded.
Flood and Water Management Act 2010 (FWMA)	Legislation which came into effect in April 2010. The Act takes forward a number of recommendations from the Pitt Review into the 2007 floods and placed new responsibilities on the Environment Agency, local authorities and property developers (amongst others) to manage the risk of flooding.
Internal flooding	Flooding of habitable living or business areas of a property. This does not include gardens and outbuildings such as sheds, garages etc. and not normally basements and porches.
Lead Local Flood Authority (LLFA)	See Appendix H.
Main River	Watercourses designated as 'main' are generally the larger arterial watercourses, as shown on the Statutory Main Rivers Map. The Environment Agency has permissive powers, but not a duty, to carry out maintenance, improvement or construction work on designated main rivers.
Ministry of Housing, Communities and Local Government (MHCLG)	The government department which sets policy on local government, housing, urban regeneration, planning and fire and rescue. They provide funding to and agree expenditure plans for Local Authorities.
National Flood Forum (NFF)	A charity to help, support and represent people at risk of flooding.
Ordinary watercourse	A watercourse that is not a designated Main River. On ordinary watercourses the LLFA (or Internal Drainage Board if relevant) have permissive powers, but not a

	duty, to carry out maintenance, improvement or construction work.
Pluvial or surface water flooding	Caused by rainfall exceeding the capacity of the ground or drainage system and occurs due to water ponding on or flowing over the ground surface before it reaches a drain or watercourse.
Property Flood Resilience (PFR) measures	Measures that are designed to keep flood water out of properties and businesses, and could include flood barriers and doors, non-return valves and airbrick covers. Sometimes also known as Property Level Resilience (PLR).
Resilient network	Approximately 16% of the total WCC maintained highway network. The resilient network is given priority during severe weather to minimise any impact on economic activity and access to key services.
Riparian landowners	Someone who owns land or property adjacent to a watercourse. Under common law, a riparian owner has a duty to maintain the watercourse and allow flow to pass through freely.
Risk management authority (RMA)	An authority which is defined as such in the Flood & Water Management Act 2010. Such authorities have powers that they can use to carry out their flood and coastal erosion risk management responsibilities. See Appendix I for a summary of these responsibilities.
Risk of Flooding from Surface Water map (RoFSW)	National-scale long-term risk mapping on gov.uk website showing the areas of England at risk of flooding from surface water. Extent, velocity and depth information is available for a range of flood probabilities.
Section 19 Flood Investigation	An investigation of a flood event by the Lead Local Flood Authority under Section 19 of the Flood and Water Management Act 2010.
Severn Trent Water (ST)	See Appendix H.
Sonde	An instrument probe that automatically transmits information about its surroundings from an inaccessible location, such as underground or underwater.
Warwickshire County Council (WCC)	See Appendix H.

8 APPENDIX H – RISK MANAGEMENT AUTHORITIES

Risk Management Authorities (RMAs) have defined roles and responsibilities with regards to flood risk management, as defined within the Flood and Water Management Act 2010.

All RMAs under the Flood and Water Management Act (2010) have a responsibility to cooperate and coordinate with regards to their flood risk management functions, including raising awareness of flood risk and the sharing of information.

The section below outlines the key roles and responsibilities of the RMAs relevant to this Section 19 flood investigation.

8.1 Environment Agency

The Environment Agency (EA) is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion in England and Wales. They have prepared strategic plans which set out how to manage risk, provide evidence (for example, their online flood maps), and provide advice to the Government.

They provide support to the other RMAs through the development of risk management skills and provide a framework to support local delivery. The EA also has operational responsibility for managing the risk of coastal erosion and flooding from main rivers, reservoirs and the sea. Main Rivers are defined through an agreed map which is updated annually. These tend to be the larger rivers in the country.

The EA are category 1 responders regarding flood risk (Civil Contingencies Act 2004). They are required to warn and inform of flood risk.

8.2 Water and sewerage companies

Severn Trent Water (STW) holds responsibility for managing risks of flooding from water supply and sewerage within the majority of Warwickshire. Thames Water have a small area of responsibility in the south of the county.

Water and sewerage companies (WaSCs) as category 2 responders to national emergencies placing on them duties to share information with other responders in an appropriate manner. They are also responsible for managing risks associated with assets or processes that may cause or be affected by flooding.

Relevant actions include the inspection, maintenance, repair and any works to their water and sewerage assets which typically includes pipes, manholes, attenuation tanks or other infrastructure such as pumping stations.

8.3 Warwickshire County Council as Lead Local Flood Authority

Lead Local Flood Authorities (LLFA) have the lead operational role in managing the risk of flooding from surface water and groundwater.

Flood risk management functions include (but are not limited to); the provision of a Local Flood Risk Management Strategy (LFRMS) and Surface Water Management

Plan, designation and maintenance of a register of structures or features that have a significant effect on flood risk, consenting and enforcement works on Ordinary Watercourses, undertaking works to mitigate surface water and groundwater flooding and undertaking Section 19 investigations.

The LLFA are a statutory consultee on major planning applications for surface water drainage. By working with developers and local planning authorities, the LLFA role is to ensure that runoff arising from major development sites is appropriately managed to avoid increasing flood risk.

8.4 Warwickshire County Council as Highway Authority

WCC also has responsibilities as a Highways Authority which may relate to flooding. Highway authorities are responsible for providing and managing highway drainage which may include provision of roadside drains/ditches and must ensure that road projects do not increase flood risk.

The Highways Authority has a duty under the Highways Act 1980 to maintain existing highways drainage. They also have powers to improve drainage systems but no duty to do so.

Highway drainage systems are designed to take highway surface water. Highway drainage systems are not designed as “storm drains”, and do not have the capacity for the level of rainfall from an extreme flash flood.

8.5 District and Borough Councils

District and Borough Councils can carry out flood risk management works on ordinary watercourses. Through the planning processes, they control development in their area, ensuring that flood risks are effectively managed. This includes the development of plans and strategies to limit or mitigate development in flood risk areas.

Within Warwickshire there are 5 district/borough councils: Stratford-on-Avon District Council, Warwick District Council, Rugby Borough Council, Nuneaton and Bedworth Borough Council, North Warwickshire Borough Council.

8.6 Landowners

Landowners have riparian responsibilities under the Flood and Water Management Act (2010) to maintain and undertake any necessary works on assets on their land (with consent from the relevant RMA) which may have an effect on flood risk including watercourses and drainage assets.

Further information on riparian responsibilities is available on www.gov.uk/guidance/owningawatercourse