Section 19 Flood Investigation

Flooding 11th June 2023 Wood End, Atherstone

Warwickshire County Council as Lead Local Flood Authority

Version	Date	Issued to
Version 1: Draft	06/10/2023	WCC FRM Team
Version 2: Draft	01/12/2023	Partner Organisations
Version 3: Final	02/02/2024	Public

CONTENTS

1 EXECUTIVE SUMMARY

Parts of Warwickshire experienced a period of isolated heavy rainfall on the 11th June 2023 resulting in internal flooding to at least 11 properties from surface water in Wood End, Atherstone. Internal property flooding was also experienced elsewhere in Warwickshire and will be subject to their own separate formal investigation and reports. Warwickshire County Council (WCC) were able to confirm 11 properties were internally flooded however it is suspected more properties were impacted. WCC did reach out to the suspected properties, but no replies were received.

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.

In the recovery phase that followed, WCC worked with Severn Trent Water, WCC Highways, Councillors, and residents to provide advice and guidance, advise on remedial works where required and to investigate the drainage 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 11th June 2023, in Wood End.

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.

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3 WEATHER AND FLOOD INFORMATION

3.1 Weather and flood warnings

The UK experienced hot weather in the week leading up to the 11th June 2023 with temperatures rising as high as 20 degrees on the 11th June 2023. 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 hot spell of weather 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. On the morning of the 10th June 2023 numerous flood alerts were also issued for the River Blythe, River Cole and the upper sections of the River Tame.

Rainfall radar data for Wood End obtained through Hydromaster, a software which WCC utilises which provides real time and historic rainfall data from the Met Office, shows that during the period of the 11th June 2023, a daily rainfall total of 54.92mm fell. Peak rainfall rates were observed between 20:00 and 00:00hrs. Within the wider catchment stretching from the River Blythe to the River Anker, Hydromaster records a daily total rainfall of 35.41mm fell.

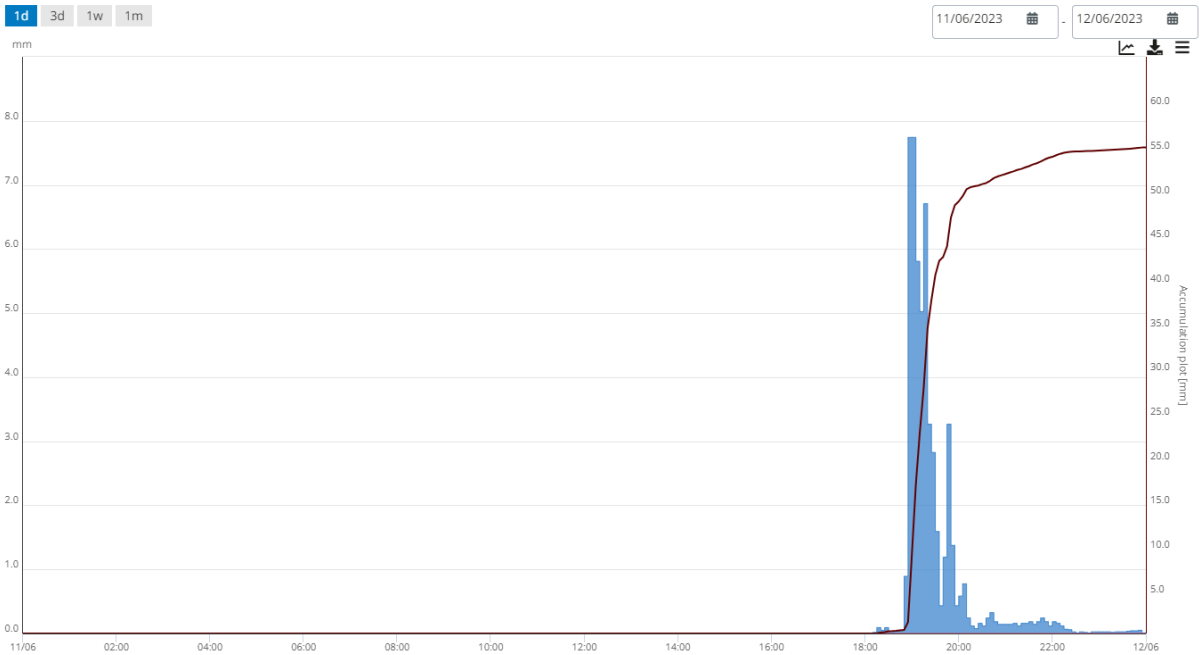


Figure 1,Wood End rainfall accumulations, source Hydromaster, data DTN

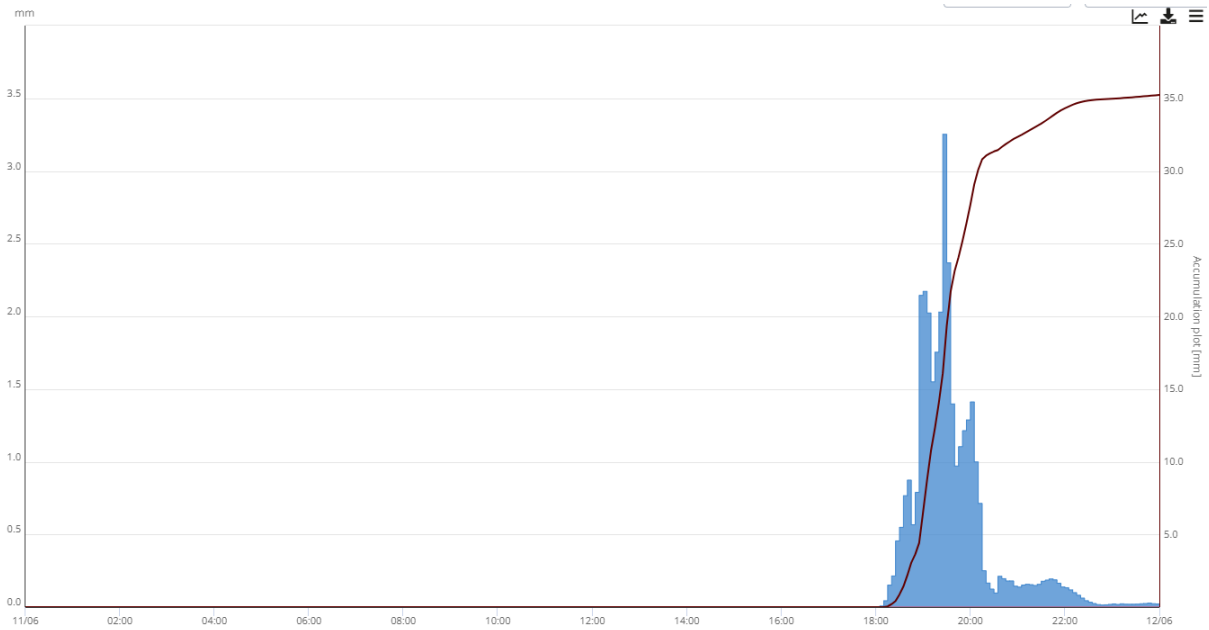


Figure 2, River Blythe to River Anker rainfall accumulations, source Hydromaster, data DTN

Anecdotal reports collated on the 11th June 2023 suggested that the intensity of rainfall was such that numerous properties in Wood End experienced ingress through the frontages of the buildings as a result of surface water. This supports wider reports from Wood End and the surrounding settlements of a short period of localised intense rainfall. Peak intensity of the event is recorded at 47mm/hr, with a total daily rainfall recorded at 54.92mm, suggesting a rough return period for the event of between 150 and 200years.

4 INVESTIGATION SUMMARY

4.1 Locations included in the investigation

The details in this investigation relate only to flooding experienced at Wood End. Flooding experienced in Hurley will be covered in a separate Section 19 report.

Figure 3: Map of Wood End 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 Wood End area during this event was characterised by short duration high intensity rainfall. The majority of the rainfall fell within a 4-hour window, with short lived periods of up to 47mm/hr high intensities recorded.

Numerous flood alerts were put into force however no fluvial response was reported during this event that impacted properties and flooding observed resulted instead from surface water flows and the inundation of artificial drainage networks, such as sewers. Where surface water flows were present, many of the resulting flow routes have exploited the built environment, such as highway, with the resulting effect of channelling water and inhibiting infiltration and was evidenced by the large amounts of surface water ponding on the highway. Flooding was reported in two mains areas within Wood End, which are detailed below: Photos have been include in Appendix E.

Wood Street

Surface water flows originating in the high land on Tamworth Road flowed down Wood Street overwhelming the WCC County Highways and Severn Trent Water (STW) systems. Tamworth Road sits with a highway finished level of 122.0 m with the lowest point of Wood Street sitting at 111.2m. After discussions with residents and partner organisations it has been determined that as a result of the intense rainfall event, artificial drainage networks becoming overwhelmed, flows began to back up out of manholes and gullies onto Wood Street. As many of the properties at this location have thresholds comparable to Wood Street, the resulting flows led to the internal flooding of five properties.

Watercourses to the West of Wood End Primary School were also found to be overgrown and the potential of a blocked culvert running underneath private land/Highway also resulted in one further property being internally flooded.

Figure 4 shows the EA surface water extent mapping for Wood Street. This does not accurately represent the flow routes reported during the event of 11th June 2023.

Figure 4, Source EA

Glenville Avenue

Surface water flows originating in the high land on Tamworth Road flowed down Wood Street and then onto Glenville Avenue overwhelming the WCC County Highways and STW systems. As a result of the intense rainfall event, artificial drainage networks becoming overwhelmed and capacity exceeded, flows began to back up out of manholes and gullies onto Glenville Avenue. As many of the properties at this location have thresholds comparable to Glenville Avenue, the resulting flows led to the internal flooding of five properties.

Figure 5 shows the EA surface water extent mapping for Glenville Avenue. This does not accurately represent the exceedance flow routes reported during the event of 11th June 2023.

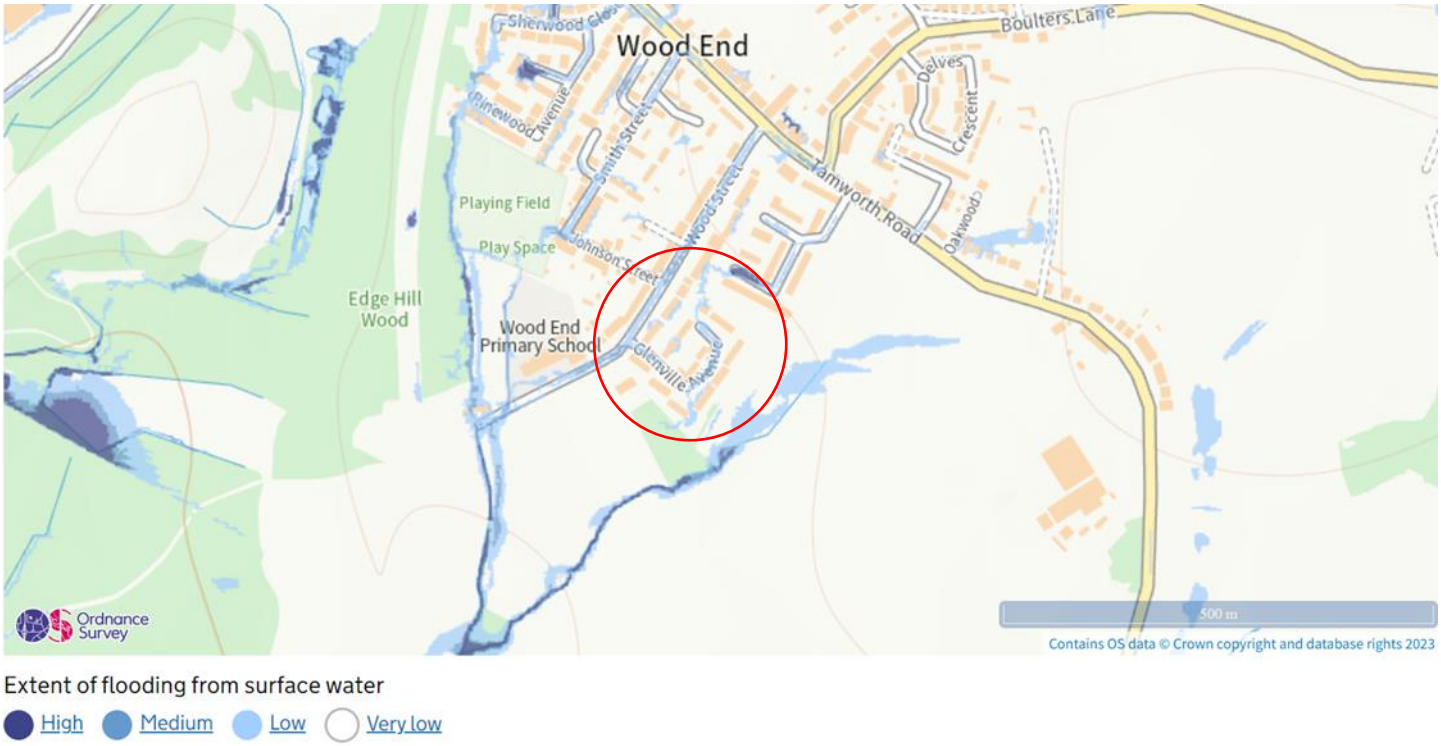


Figure 5, Source EA

5.2 Gathering data for the investigation

In the immediate aftermath of the flood events, officers from WCC (Flood Risk Management and County Highways) and Severn Trent Water attended this location to provide advice and to better understand the flooding mechanisms. Frequent site visits have been held since with Councillors and the community to discuss ongoing issues. WCC have also been in frequent communication with partners to discuss any future investigation work deemed to be necessary. For residents we could not talk to in person, questionnaires were left at the property however to date these questionnaires have not yet been returned to WCC.

5.3 Summary of investigations

Wood Street
CCTV and jetting surveys of the artificial drainage network have been undertaken by WCC Highways and STW, with regular updates provided to residents when requested, though some investigation remains outstanding.

Small defects have been identified in the artificial drainage network and these will be rectified by the relevant asset owner. The relevant landowners have also been contacted and watercourse maintenance reminder letters have been posted out. It is the opinion of WCC and partners that had all drainage systems been operating as intended, flooding would have still occurred due to the intensity of rainfall.

Glenville Avenue

CCTV and jetting surveys of the artificial drainage network have been undertaken by WCC Highways and STW, with regular updates provided to residents when requested, though some investigation remains outstanding.

Small defects have been identified in the artificial drainage network and these will be rectified by the relevant asset owner. Options to install additional drainage on Glenville Avenue are also currently being explored. It is the opinion of WCC and partners that had all drainage systems been operating as intended, flooding would have still occurred due to the intensity of rainfall.

6 APPENDICES A-B: LOCATION REPORTS

Appendix A: Wood Street/Glenville Avenue Location
Appendix B: Wood Street/Glenville Avenue Actions and Opportunities

Wood Street/Glenville Avenue, Wood End

What was affected?

Properties internally flooded	11
Properties externally flooded	0
Critical Infrastructure flooded	0

Source of flooding

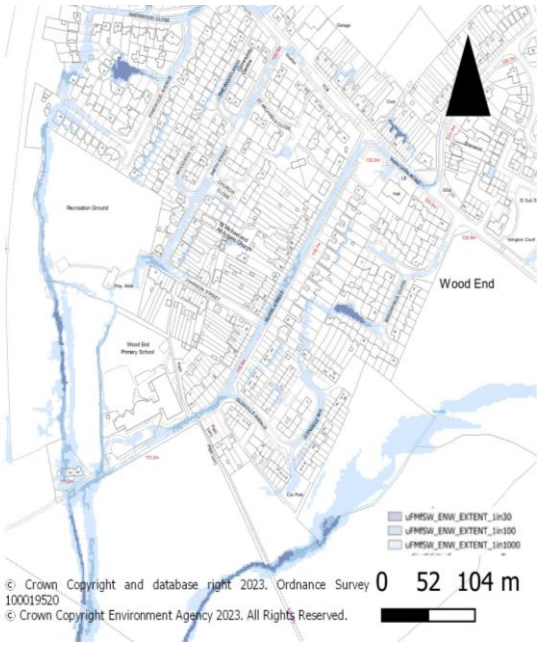
Surface water	✓
Sewers	✓
Main river	✗
Ordinary watercourse	✓
Other	✗

How does the existing system operate?

The village of Wood End is located about 6 miles West of Atherstone.

Wood Street/Glenville Avenue is an area of adopted highway which serves as access for many properties and an associated Primary School. A STW combined sewer originates from Tamworth Road and runs beneath Wood Street, past the Primary School before crossing the highway into the adjacent field going southwards towards Hurley. Beneath Glenville Avenue there is an existing foul sewer which flows towards Wood Street and taps into the combined sewer. There is also a surface water sewer which originates from Birchfield Close, flows beneath a number of properties and eventually outfalls into a watercourse at the rear of Glenville Avenue.

North of Wood Street and West of the Primary School there is a series of Ordinary watercourses which convey overland flows as well as acting as a discharge point from the upstream STW surface water sewers. These ordinary watercourses become culverted beneath private land/adoptable highway and discharge into an open watercourse the opposite side of the highway from the primary school.



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 June 2023. Darker blues indicate higher risk.

What happened here on 11th June 2023?

Two distinct surface water flow paths were noted to have occurred during this event. The primary originated on the higher land on Tamworth Road and proceeded to flow down Wood Street overwhelming the WCC County Highways and STW systems. Tamworth Roads sits with a finished level of 122.0 m with the lowest point of Wood Street sitting at 111.2m. As a result of the intense rainfall event, artificial drainage networks becoming overwhelmed, flows began to back up out of manholes and gullies onto Wood Street. The primary flow path then proceeded to flow down Glenville Avenue and once again resulted in the artificial drainage networks becoming overwhelmed and flows began to back up out of manholes and gullies onto Glenville Avenue.

As many of the properties at this location have thresholds comparable to Wood Street and Glenville Avenue, the resulting flows led to the internal flooding of ten properties.

The secondary flow path originated from the fields to the North of Wood Street and the West of Wood End Primary School via a series of Ordinary Watercourses. Significant flows were observed flowing through these watercourses prior to flowing through a culvert beneath private land/adopted highway. As a result of a combination of overgrown and heavily vegetated watercourses and a potential blockage in the culvert, a further property on Wood Street was internally flooded.

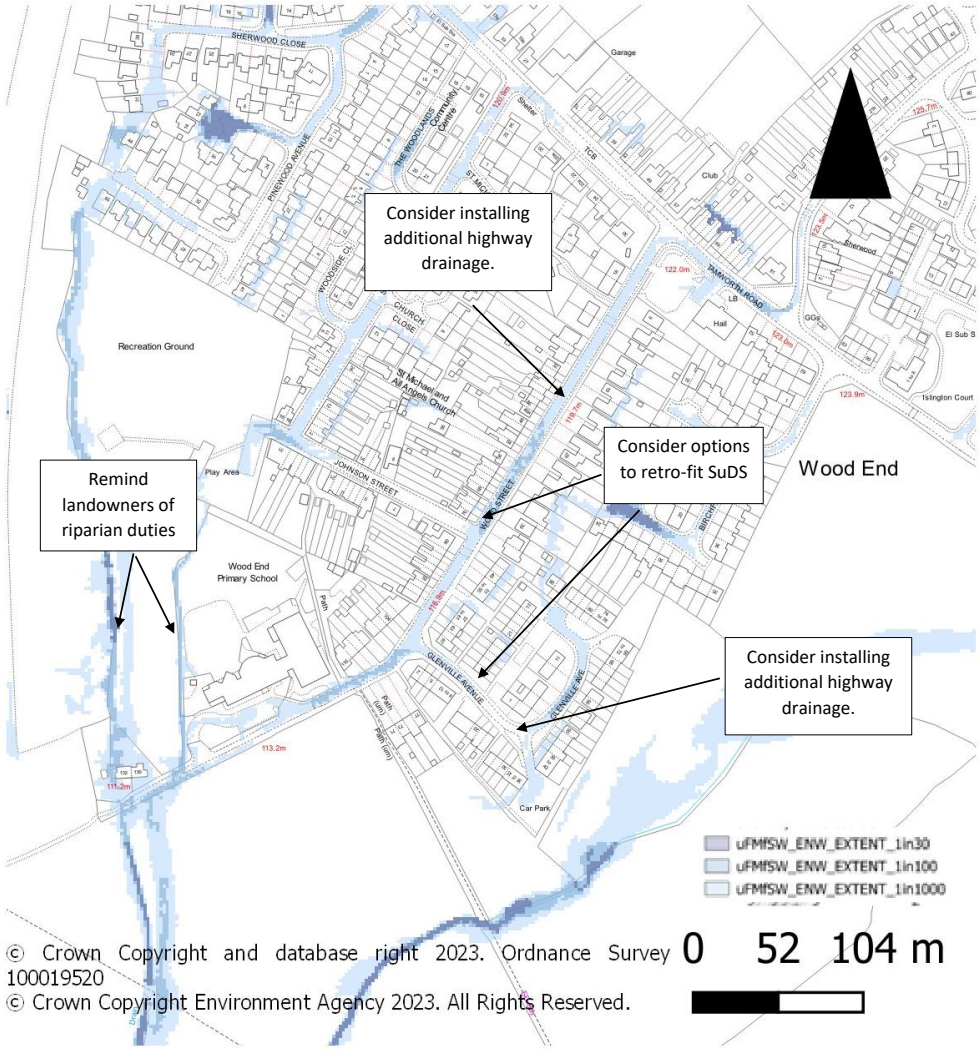
Is there a history of flooding in this location?

WCC as the LLFA hold historic records of flooding occurring in Wood End in both 2018 and 2012. Both reports of flooding were as a result of surface water runoff. One report stating surface water runoff originating from from a farmer's field and the other report required sandbags to be used in order to prevent internal property flooding from occurring.

What actions are being taken?

No.	Action	Responsible party	Progress
1	Undertake appropriate channel maintenance	Landowner	Ongoing
2	Consider options to retro-fit Sustainable Drainage Systems (SuDS) on Wood Street and Glenville Avenue	LLFA	Ongoing
3	Ensure that highway cyclic gully cleansing is scheduled at an appropriate interval	WCC Highways	Ongoing
4	Offer advice to residents that have been internally flooded from this event	LLFA	Ongoing
5	Advise resident to consider investigating the presence of a potential blockage of culvert beneath their land and undertaking repairs as appropriate.	LLFA	Complete
6	Remind local landowners of their riparian duties to maintain watercourses	LLFA	Ongoing
7	Reline/patch areas of the sewer networks where defects have been identified	STW	Ongoing
8	Consider installing additional highway drainage along Wood Street and Glenville Avenue	WCC Highways/LLFA	Ongoing
9	Residents to consider the installation of Property Flood Resilience (PFR) measure	Residents	Ongoing

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



7 APPENDIX C – 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 D
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 D.
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.
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).
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 (STW)	See Appendix D.
Warwickshire County Council (WCC)	See Appendix D.

8 APPENDIX D – 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.

As a Category 1 Responder under the Civil Contingencies Act, the LLFA as a local authority plays a leading role in emergency planning and recovery after a flood event and has plans in place to respond to emergencies, and control or reduce their impact.

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

9 APPENDIX E – PHOTOGRAPHS