

Hollywood Flood Event May 2018

Investigation Report



Content

1.	Introduction	3				
2.	Background	4				
	 2.1 Location 2.2 Local watercourses and drainage 2.3 Past flooding and drainage issues 2.4 Risk Management Authorities in Worcestershire 	4 4 5 6				
	2.5 Other council responders2.6 First responders	6 6				
3.	Flood event	7				
	 3.1 Weather / rainfall data 3.2 Flood event description 3.3 Flood event impacts 	7 7 8				
4.	Flood event response, recovery & investigation	9				
	 4.1 Timeline 4.2 Risk Management Authority & first responder evaluation 4.2.1 Local Resilience Forum de-brief 4.2.2 Individual Risk Management Authority / first responders review sessions 4.3 Resident feedback 	9 10 10 10 10				
5 .	Drainage infrastructure & watercourse response & investigation	11				
	5.1 Watercourses5.2 Highway drainage infrastructure5.3 Sewer infrastructure	11 11 11				
6.	Key issues & lessons learned	12				
7 .	Key recommendations	13				
8.	Next steps	15				
9.	Conclusion	16				
App	pendix A: Flood & Water Management Act (2010) s19 duty to investigate flooding	17				
App	pendix B: Flood extent map	18				
Appendix C: Flood water flow path map						
App	Appendix D: Flood event response & recovery timeline					

Introduction 1.

On 27th May 2018 an unprecedented rain storm hit Hollywood and parts of the wider Wythall parish in north east Worcestershire. This resulted in surface water and watercourse flooding which had a range of relatively minor impacts on infrastructure but a devastating impact on more than 300 residential properties and businesses.

A combination of organisations, local councillors and the local community worked together to respond to the initial flood event emergency and then to deal with the ongoing recovery process.

This report summarises the investigation carried out by Worcestershire County Council, as the designated Lead Local Flood Authority, under its statutory duty within section 19 of the Flood & Water Management Act (2010) to investigate and report on flooding it deems to be significant.

The investigation has examined the flood event, the immediate response to it and the ongoing recovery from it and it has developed a number of key recommendations for future action.



Background 2.

2.1 Location

Hollywood lies within the parish of Wythall, in the north-eastern most part of Worcestershire, around seven miles south of Birmingham City Centre. The parish is generally rural but Hollywood, and the adjoining Drakes Cross, is its main residential area with a population of around 4,800. Hollywood lies in a triangle between the Alcester Road, Hollywood Lane and Houndsfield Lane.



Figure 1. Location map

2.2 Local watercourses and drainage

The Parish of Wythall drains to the River Cole but within the Hollywood area the primary watercourse is known as the Hollywood Brook.

The Hollywood Brook is principally formed of two tributaries both of which rise to the west of the Hollywood bypass. The northern branch rises to the north of Packhorse Lane and the southern branch rises directly below, on the southern side of Packhorse Lane.

These two branches meet near to Dyas Road and then continue along Lynbrook Close and through the Gay Hill Golf Course before joining the Peter Brook. This brook then flows out of the county when it reaches its confluence with the River Cole.

Much of the rest of Wythall parish drains via the Shaw Brook before it also joins the River Cole at Houndsfield Lane.

Some sections of watercourse become part of the storm sewer network which is the responsibility of Severn Trent Water Ltd.

Otherwise the area is mainly drained via separate foul and storm sewers, with storm sewers discharging into the watercourse at May Lane, Douglas Road, between Dyas Road and Lynbrook Close and finally at Hollywood Lane. There are also a few stretches of combined sewer, which carry both foul and rain water, draining through the residential area.

Most of the properties in Hollywood were constructed between the 1960s and 1980s when the planning process was considerably less demanding than it is today about the need for adequate space for water and adequate management of surface water.

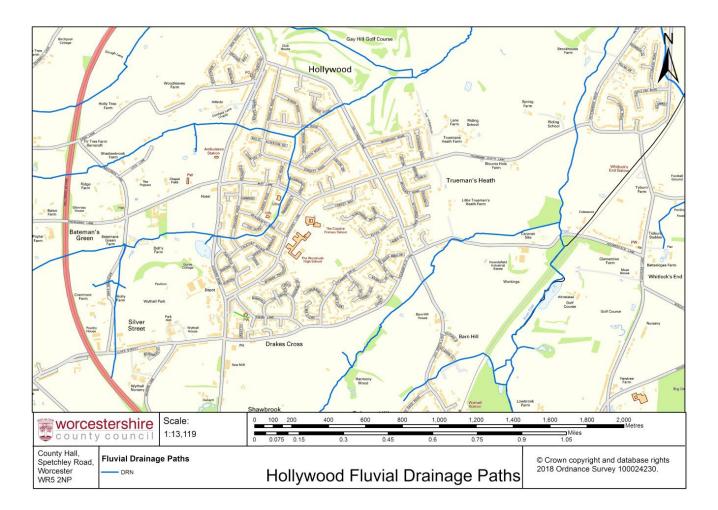


Figure 2. Local watercourses

2.3 Past flooding and drainage issues

The parish of Wythall has a history of relatively minor flooding. Dates of reported incidents include 1977, all but four years between 1981 and 2009 and 2012, when four properties and two roads were flooded. There have been no reports of flooding in the area since then.

Historic records mention works to address flooding in the area including foul system schemes on Alcester Road and Corbett Road and storm water sewer upgrades at Windrush Road.

2.4 Risk Management Authorities in Worcestershire

Risk Management Authorities are organisations with flood-related responsibilities designated in the Flood & Water Management Act (2010). In this flood event the following risk management authorities were involved in the response and recovery efforts:

- Worcestershire County Council in its role as Lead Local Flood Authority responsible for the management of flooding from surface water and ordinary watercourses (smaller watercourses not recorded as Main Rivers)
- Worcestershire County Council in its role as Highway Authority responsible for the management of highway drainage and flooding from the highway
- Bromsgrove District Council jointly responsible for enforcement of the Land Drainage Act with regard to the management of ordinary watercourses via its North Worcestershire Water Management Team (shared with the other north Worcestershire district councils)
- Severn Trent Water Ltd responsible for the sewer network and clean water supply
- Environment Agency responsible for the management of flooding from Main Rivers (larger rivers and watercourses recorded on the Main River map) and the national, strategic overview of flood risk management. None of the watercourses in the Hollywood flood event area are Main Rivers but the Environment Agency provided extremely welcome advice and support to the response and recovery effort

2.5 Other council responders

In addition, a number of other county and district council functions are typically involved in response to and recovery from a flood event and this was the case at Hollywood. They include:

- Worcestershire County Council Emergency Planning, Adult and Social Care
- Bromsgrove District Council Environmental Services, Housing, Emergency Planning
- County & District shared service Worcestershire Regulatory Service

2.6 First responders

The emergency event was also responded to by some of the 'first responders':

- West Mercia Police
- Hereford & Worcester Fire & Rescue Service

Flood event 3.

Weather / rainfall data

On 27th May 2018 an extremely intense rainfall event hit Hollywood and parts of the wider Wythall parish. Parts of neighbouring Birmingham and Solihull were also badly impacted.

Two months-worth of rain (130mm) fell in just two hours with an estimated probability of 1 in 2,000yrs or 0.05% in any year. The rainfall radar image below confirms that over 64mm of rain fell over the Hollywood area during a one hour period although we know that at least 68mm actually fell in one of the two hours.

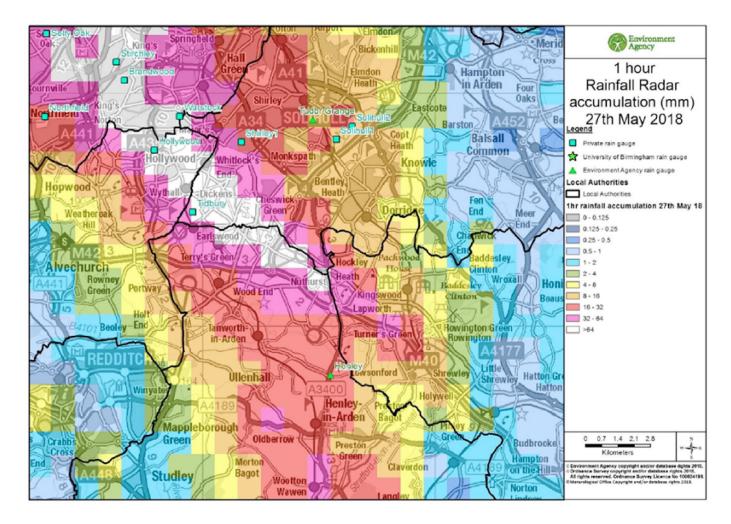


Figure 3. Rainfall radar

3.2 Flood event description

Within a very short time after the start of the rainfall highway drains and sewer infrastructure became overwhelmed and roads became surface water flow paths with deep water pooling in a number of low spots.

The network of watercourses also quickly became overwhelmed with the influx of rain water and surface water causing them to come out of bank and back up in locations where infrastructure barriers, such as fences or garages, or the limited capacity of culverts throttled the flow.

The 1 in 1000yr layer of the Environment Agency modelled 'Risk of Flooding from Surface Water' map (Appendix B) replicates quite accurately the extents of the watercourse flooding and some of the surface water flooding. However, it does not sufficiently represent the full extent of surface water flow, particularly along the road network.

Some of the key flow paths have been captured from discussion with residents and Risk Management Authority response staff and they are shown in Appendix C.

In most locations the water level fell almost as rapidly as it had risen, indicating that the drainage infrastructure was working properly and that it had simply been overwhelmed. However, in a small number of locations the water remained high for an extended period, indicating a potential issue with the drainage infrastructure.

3.3 Flood impacts

The deluge and subsequent surface water and watercourse flooding had a devastating impact on the community as follows:

- 258 residential properties confirmed as internally flooded
- 67 further residential properties externally flooded
- 1 business internally flooded
- Several roads temporarily closed including Houndsfield Lane ford
- 2 schools partially internally flooded
- At least 10 cars written off

Whilst this impact on property, infrastructure and belongings is hugely significant the biggest impact is upon the residents themselves.

The impact on mental wellbeing was extremely significant but it is impossible to accurately measure or articulate, not least because for many it is ongoing.

Many residents were forced to relocate in order to allow repairs to be carried out to their properties and at the time of this report's publication, some seven months later, a number of these residents have still not returned to their homes.

The economic impact of the flood event will include property and infrastructure repairs and replacement, response and recovery efforts and development and implementation of future flood risk and impact reduction measures. This is likely to total in excess of fifteen million pounds.



4. Flood event response, recovery & investigation

Timeline 4.1

A timeline of the key events and response / recovery activities has been compiled from discussions with the Risk Management Authorities, first responders, local councillors, residents and records held by individuals and relevant organisations. The timeline is Appendix D of this report and it includes:

- Rescue from flooded properties and flood water including in boats
- Inspection and jetting highway gullies and drains
- Emergency closure of flooded roads
- Liaison with residents and provision of advice and support including hundreds of house to house visits
- Deployment of sandbags
- Deployment of the National Flood Forum trailer at various locations to give specialist advice and support to residents
- Establishment, maintenance and promotion of a single emergency response telephone number
- Establishment of an advice and support presence at the Wythall Hub
- Provision of specialist advice and support to vulnerable residents including via the National Flood Forum
- Assistance with removal of damaged goods
- Publication of hard copy, website and social media updates and contact numbers for residents
- Organisation of two advice and support drop-in sessions for residents
- Organisation and attendance of frequent multi-agency co-ordination meetings
- Inspection and survey of highway drainage, watercourses and sewer infrastructure
- Surveying of over 1,000 topographic levels in the affected area
- Repair of damaged highways
- Sweeping of footways
- Reviewing the emergency response



4.2 Risk Management Authority & first responder evaluation

4.2.1 Local Resilience Forum de-brief

It is routine procedure that the response to an emergency event is reviewed via a standard de-brief process. This process is established and administered by the Local Resilience Forum, a partnership of emergency response organisations based upon police administrative regions.

The Hollywood flood event debrief process took place during July 2018. It was carried out by members of the West Mercia Local Resilience Forum and involved representatives from all of the Risk Management Authorities and some other first responders. The key issues and lessons learned by this process are listed within section 6 of this report and the resulting key recommendations are listed in section 7.

4.2.2 Individual Risk Management Authority and first responder review sessions

The Local Resilience Forum de-brief process was complimented by individual review sessions with each Risk Management Authority and some first responders. The sessions were held with representatives from the Lead Local Flood Authority and they helped to build the timeline in Appendix D and shape the 'Key issues & lessons learned' in section 6. and the 'Key recommendations' in section 7.

4.3 Resident feedback

Feedback from residents has been sought and gathered in a number of ways including:

- Discussions with individuals during the emergency response
- Discussions with individuals during visits to properties
- Discussions between local councillors and residents
- Via social media
- Directly via correspondence with the Risk Management Authorities
- At the National Flood Forum trailer which toured the area between 4th and 7th June 2018
- At the public meeting with the local MP and Conservative councillors on 15th June 2018
- At the insurance drop-in session with the National Flood Forum on 16th August 2018
- At the investigation drop-in session on 2nd October 2018

Much of the feedback was responded to and acted upon immediately but more general feedback has been fed into the investigation process and it is reflected in this report.

Drainage infrastructure & watercourse response & investigation **5**.

Immediately after the flood event Worcestershire County Council, North Worcestershire Water Management and Severn Trent Water Ltd began a thorough inspection of all highway drainage infrastructure, sewer infrastructure and the network of local watercourses:

5.1 **Watercourses**

North Worcestershire Water Management carried out initial inspections of watercourses during the week following the flood and this was followed up by more detailed inspections over the following four months.

Work on watercourses has included:

- Completion of over 1000 detailed topographic surveys
- Survey of 11 sections of culverted watercourse
- Procurement of two water level monitors to be installed in early 2019
- Removal of a collapsed wall from the Hollywood Brook
- Removal of an un-consented weir which was holding back water
- Desk-based assessment of the modifications to the watercourse during the development of the Hollywood estates to inform future potential mitigation measures
- Assessment of culvert trash-screens
- Clearance of ditches

5.2 Highway drainage infrastructure

Worcestershire County Council began jetting highway gullies on the evening of the flood event and continued for the following week until all gullies had been inspected and jetted when necessary.

Highway Engineers have continued to inspect and survey all of the culverts beneath roads and any gullies suspected of being damaged or blocked.

In addition, a drainage improvement scheme has been completed on the Alcester Road which will reduce the risk of the road and adjacent properties flooding in the future.

Work on highway drainage has included:

- Inspection of nearly 3,000 gullies
- Jetting of more than 870 gullies
- Detailed inspection of 11 sections of culverted watercourse
- Repair/re-surfacing of more than 150m² of highway and footway
- Completion of a drainage improvement scheme

5.3 Sewer infrastructure

Staff from Severn Trent Water Ltd responded to reports of sewer network issues in the immediate aftermath of the flood event and followed this up with pro-active inspection of key pieces of infrastructure over the following weeks.

Key issues and lessons learned 6.

A number of issues and learning points have emerged from the flood event via the Local Resilience Forum de-brief, review sessions with the Risk Management Authorities and feedback from residents. The key points include:

Response & Recovery

- The cover of darkness, speed with which the flood water receded and lack of obvious activity meant that the full extent of the flooding took time to become clear
- The emergency response from the community, the Risk Management Authorities, the local councillors and the first responders was generally very good and speedy
- Responders weren't always easily identifiable on the ground
- A presence at the local hub could have been established a bit sooner
- The immediate availability of standard information for residents would have been useful
- The single emergency contact number could have been established and promoted a bit sooner
- There was good partnership working, communication and co-ordination between the Risk Management Authorities and other responders
- Advice and support provided by the National Flood Forum was extremely valuable
- The community responded admirably to the emergency but a focus for its actions going forward would be helpful
- The response from insurance companies has been varied with some being entirely unsatisfactory

Investigation

- Highway drainage and sewer infrastructure was in generally good working order although it was overwhelmed by the volume of rain water
- The watercourses are in generally good order, with few obstructions, although they were overwhelmed by the volume of rain water
- Significant sections of the watercourse have no clearly identifiable riparian owner which could make it difficult to keep them in good working order in the future
- The culvert from Lynbrook Close underneath Hollywood Lane could not cope with the significantly increased volume of water
- Watercourses out of bank and surface water flow paths in a number of locations were restricted by the presence of properties, garages and fences etc

Mitigation & Resilience

- Installation of Property Flood Resilience can reduce the impact of any future flooding on a significant number of residential properties
- The trash screens on a number of culverts can be improved to help ensure that they don't get blocked although none were found to have negatively contributed to this event

Key recommendations 7.

The following key recommendations have emerged from the flood event response debrief, the investigation and community feedback. Many are specifically relevant to Hollywood whilst others are relevant to flood risk management across Worcestershire.

	Recommendation	Lead			
Respo	Response & Recovery				
KR1	Produce standard advice and support materials for distribution to impacted communities during future surface water flooding events	Worcestershire County Council			
KR2	In future surface water flood events always assume there might be more impact than immediately apparent and proactively establish this at the earliest possible stage	Risk Management Authorities			
KR3	Complete the production of a standard flood kit to include a surface water flood event response & recovery checklist / aide memoire	North Worcestershire Water Management			
KR4	Pursue specific particularly unsatisfactory response from insurance companies	National Flood Forum			
KR5	Clarify and confirm the role that health professionals should perform in identifying and responding to residents with mental and physical health issues during future flood events	Worcestershire County Council			
KR6	In future flood events ensure that responders are easily identifiable on the ground	RMAs and first responders			
Invest	igation				
KR7	Complete the survey of drainage infrastructure and watercourses	All councils			
KR8	Clarify riparian ownership and responsibility for ongoing maintenance of all watercourses	North Worcestershire Water Managemen			
KR9	Investigate the potential to improve the conveyance of water from Lynbrook Close underneath Hollywood Lane and feed any solutions into the mitigation / resilience action plan	Worcestershire County Council			
KR10	Investigate the potential to improve the conveyance of water in Lynbrook Close and feed any solutions into the mitigation / resilience action plan	North Worcestershire Water Managemen			
KR11	Create a basic hydraulic model of the watercourse network in order to help identify and act upon any opportunities for mitigation works and / or improved maintenance, including those referred to in other key recommendations	North Worcestershire Water Managemen			
KR12	Investigate the potential for attenuation areas upstream of Hollywood and within its greenspace	North Worcestershire Water Management			

Mitiga	Mitigation / Resilience			
KR13	Install better trash screens on all relevant culverts in order to prevent future blockages	Worcestershire County Council		
KR14	Promote awareness of relevant responsibilities to riparian owners and encourage their implementation through advice, support and enforcement if necessary	North Worcestershire Water Management		
KR15	Develop a proposal and funding bid for a project to support the installation of Property Flood Resilience measures	North Worcestershire Water Management		
KR16	Complete the installation of two ordered water level monitors on the Hollywood Brook in order to build a clear picture of its response to rainfall events and provide a potential early warning of future flood events	North Worcestershire Water Management		
KR17	Continue to monitor and support the relevant response to residents' health and welfare issues	Bromsgrove District Council		
KR18	Establish a multi-agency Flood Risk Management Plan Group to develop and implement a co-ordinated Flood Risk Management Plan in partnership with the community	Worcestershire County Council		
KR19	Support and encourage the establishment of a Community Flood Action Group	Worcestershire County Council		
KR20	Continue to liaise closely with Birmingham City Council, Solihull Borough Council and the Environment Agency about cross-border flood risk management issues	North Worcestershire Water Management		
KR21	Carry out a county-wide assessment of the risk of future potential surface water flooding	Worcestershire County Council		
KR22	Ensure that any future development in the Hollywood area is resilient and where possible contributes to the reduction of existing flood risk	All councils		

Next steps 8.

- Discuss this report and its key recommendations with partners, stakeholders and particularly the impacted community
- Establish a multi-agency Hollywood Flood Risk Management Plan Group
- Encourage and support the establishment of a local community flood action group
- 4. Produce an agreed detailed action plan, based on the key recommendations, the implementation of which will be monitored by the Worcestershire Flood Risk Management Strategic Co-ordinating Group
- Develop the detail of specific actions in the plan and identify and secure funding
- Implement the action plan



Conclusion 9.

The impact of the flood event in Hollywood was extremely significant and devastating for the community and its effects will be felt by residents for many years to come.

In addition the economic cost of the flood event is likely to total in excess of fifteen million pounds.

The rain storm which hit Hollywood and the wider Wythall parish on 27th May 2018 was unprecedented in terms of its scale over such a short duration and it exceeded anything experienced during the 2007 flood event.

It is not practically possible to design and construct drainage infrastructure which will contain or cope with such a rain event and assessment of the drainage infrastructure and watercourse network has confirmed that it was in generally good order but simply overwhelmed.

The absence of adequate space for water and consideration for potential surface water flooding is typical of residential developments from the same period as those at Hollywood and this undoubtedly contributed to the scale of impact.

In addition, the unpredictable nature of the storm event meant that it was, and would always have been, impossible to predict the scale of its impact and its location, removing the potential for significant preparation.

The overriding feedback from residents and independent commentators is that response to the emergency from the relevant agencies, local councillors and from the community itself was good and speedy. Furthermore, the ongoing recovery effort has also been welcomed and well received.

Nonetheless, there are a number of key lessons to be learned in terms of the both the emergency response and the ongoing recovery effort and the partnership of agencies and the community are committed to making changes to address them.

There are also a number of measures which can be taken by the agencies and the community which will reduce the scale of the impact of a future potential flood event and possibly even, to some extent, also reduce its likelihood.

Appendix A:

Flood & Water Management Act (2010) s19 duty to investigate flooding

Worcestershire County Council, within its role as Lead Local Flood Authority, has a duty to investigate flood events it deems to be 'significant' as detailed in Section 19 of Part 3 of the Flood and Water Management Act (2010) as follows:

Section 19

- 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 proposing to exercise, those functions in response to flood.
- 2) Where an authority carries out an investigation under subsection 1) it must:
 - (a) publish the results of its investigations; and
 - (b) notify any relevant risk management authorities.

Worcestershire County Council Triggers

All flood events will be investigated informally but flood events resulting in one or more of the following impacts will normally be formally investigated under the Flood & Water Management Act:

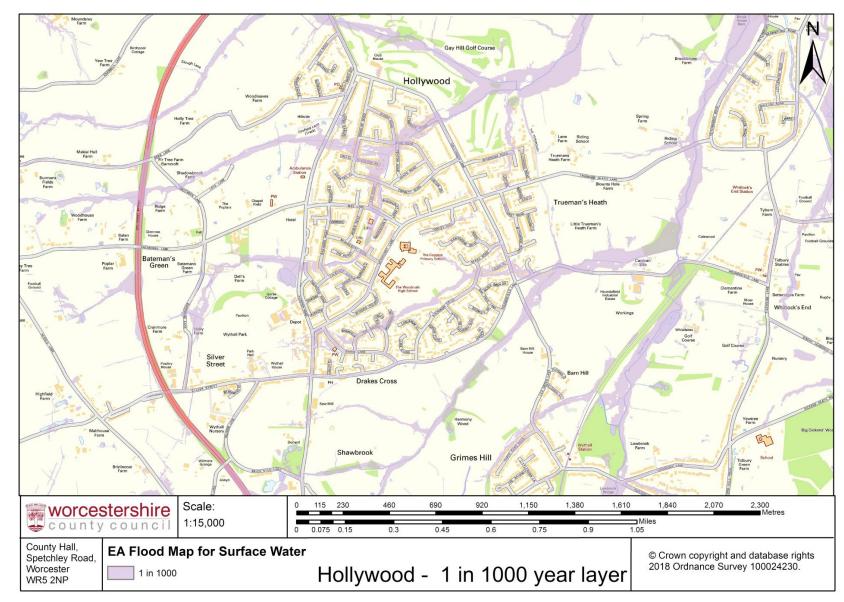
- Danger to life
- 10 or more properties internally flooded
- 10 or more businesses severely disrupted
- 1 or more pieces of critical infrastructure severely impacted

A formal investigation under the Flood & Water Management Act might also be triggered if there is one or more of the following:

- Very frequent flooding
- Impact on particularly vulnerable people
- Severe economic disruption
- Significant environmental impact
- Requests of a significant weight

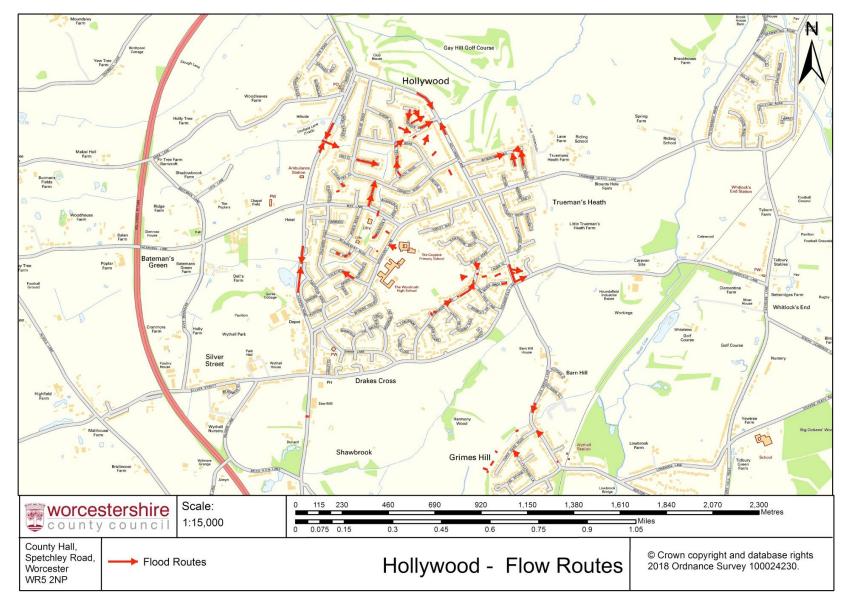
Appendix B

Extent of flooding



Appendix C

Flood water flow path map



Appendix D

Flood event, response and recovery timeline

Day / Time	Event / Activity
Sunday 27th May	
16.00	Rain started
17.30	Amber weather warning received from Met Office
17.50	Highway Authority receives first calls about flooding – out of hours phone line continued to take calls throughout the evening
18.00	Highway gulley emptiers and gangs deployed
18.30	Peak of flooding
18.30 - 00.30	Councillors, Worcestershire County Council Highway managers, staff, several highway gangs, 2 x gulley emptiers on site – gulley emptying / jetting, culvert clearance, road closure and reopening, liaison with residents and other responders
	Police, Fire & Rescue, Western Power on site
19.25	Fire & Rescue control request deployment of sandbags
19:45	Sandbag request passed to Bromsgrove District Council Out of Hours by Worcestershire County Council Emergency Planning Duty Officer WCC Highways managers drive around known impacted roads and no other visible issues / residents outside etc
	Instruction issued for highway gangs and gulley emptiers etc to be deployed on Monday morning
Monday 28th May	
07.00	Site inspected and much more evidence of residents and flooding
	Extent of impact gradually becomes more apparent
08.00 onwards	Bromsgrove District Council staff out on site and liaising with Worcestershire County Council Highways staff
	Adult and Social Services contacted
	Councillors active on site inc visiting residents etc
	Worcestershire County Council Highways and Bromsgrove District Council
	Environmental Services resources active all day including gulley emptiers, road sweepers, gangs etc – deployed on known locations in turn
	Additional central co-ordination deployed inc Worcestershire County Council Flood Risk & Highway Drainage Manager

Tuesday 29th May	
	Worcestershire County Council internal Silver meeting
	Worcestershire County Council Highways co-ordination briefings
	Additional Highways resources identified including carriageway patcher
	Worcestershire County Council Highway Control Centre established central single number for direct comms
	Highways gangs, sweeper, gulley emptiers continued
	Additional Worcestershire County Council capacity deployed on central co-ordination and support
	Update and co-ordination meeting held with key Bromsgrove District Council and Worcestershire County Council reps
	North Worcestershire Water Management produce maps, surveys and list of properties to visit etc
	Councillors active on site inc visiting residents etc
Wednesday 30th May	
	Continued drainage infrastructure inspection and repair
	Worcestershire County Council internal Silver meeting
	Operational response & recovery co-ordination meetings
	Wythall Hub staffed
	Around 100 houses visited by North Worcestershire Water Management officers and councillors between 10am and 8pm including provision of key health messages
Thursday 31st May	
	Bromsgrove District Council Minor Works team cleared a large section of collapsed wall from a section of watercourse
	Multi-agency Recovery Co-ordinating Group update meeting at Severn Trent Water Ltd depot
	West Mercia Local Resilience Forum Tactical Control Group meeting
	Further door-knocking by North Worcestershire Water Management officers
	Central phone line set up and publicised
	Wythall Hub staffed
	Sandbags deployed to Wythall Hub
	Tactical Control Group triggered
	Councillors active liaising with residents and RMAs

June	
	Wythall hub staffed until Saturday 2nd June
	National Flood Forum trailer on site for w/c 4th June
	Regular multi-agency Recovery Co-ordination Group and Communications Group meetings
	Watercourse and drainage infrastructure surveys continue
	Individual properties visited in wider area
	Topographical surveys commence - ongoing
	Councillors active liaising with residents and RMAs
	Councillor / MP public meeting
July	
	West Mercia Local Resilience Forum debrief session
	North Worcestershire Water Management submit outline bid for future potential flood alleviation works funding to the Regional Flood Coastal Committee
	Regular multi-agency Recovery Co-ordination Group meetings
	Watercourse and drainage infrastructure surveys continue
	Councillors active liaising with residents and RMAs
August	
	Insurance advice drop in session with the National Flood Forum on 16th August
	Watercourse and drainage infrastructure surveys continue
	Councillors active liaising with residents and RMAs
September / Octo	ober
	Response review meetings held with individual Risk Management Authorities and first responders
	North Worcestershire Water Management met with Solihull MBC about cross-border issues
	Remaining culvert surveys carried out
	Investigation / advice drop-in session held for residents
	Watercourse and drainage infrastructure surveys continue
	Councillors active liaising with residents and RMAs