

## Cabinet – 20 March 2019

### Flood Risk Management in Walsall

**Portfolio:** Councillor Harrison Clean and Green

**Related portfolios:** Councillor Andrew, Deputy Leader & Regeneration portfolio

**Service:** Planning, Engineering and Transportation

**Wards:** All Wards

**Key decision:** No

**Forward plan:** Yes

#### 1. Summary

1.1 The Flood and Water Management Act 2010 (“FWMA 2010”) was enacted to provide:

- more comprehensive management of flood risk for homes and businesses
- safeguards against rises in surface water drainage charges
- protection to water supplies for consumers

Walsall Metropolitan Borough Council is the Lead Local Flood Authority (“LLFAs”) for the purposes the FWMA 2010. LLFA’s have the lead responsibility for managing the risks of flooding from surface water, groundwater and ordinary watercourses (which excludes main rivers managed by the Environment Agency) within their area.

1.2 Under Section 19 of the FWMA (2010) places the Council, as the LLFA, has a duty to investigate on becoming aware of flooding in its area.

As part of its investigatory duty, the Council must to the extent that it considers it ‘necessary or appropriate’ to do so determine which other authorities have the relevant functions and responsibilities to respond to flood in its area and what actions they are proposing to take or have taken

1.3 The Council also has a co-ordinating role under the FWMA 2010 and must undertake detailed flood investigation and assessment where it is aware of a group of five or more properties have been affected by internal flooding. The WFMA 2010 does not place the Council under a statutory duty to prevent flooding reoccurring. The Council does however, work with all relevant organisations and local communities as far as reasonably possible to reduce the likelihood of a repeat flood event. Under the Civil Contingencies Act 2004, the

Council is also under a duty to respond to emergencies defined within Act which includes flood incidents.

- 1.4 Under the FWMA 2010, where the Council as the LLFA has carried out an investigation in relation to flood in its area, it is required to publish the results of those investigations. The Council's investigations into the 27 May 2018 flood incidents is set out in the document entitled "The Section 19 Flood Investigation Report" (hereafter referred to as the "the Section 19 Report")

The Section 19 Report and its appendices provide details on the 27 May 2018 flood incidents. The Section 19 Report has been produced by Staffordshire County Council who have been assisting the Black Country under a service arrangement for flood risk management in the Borough/Black Country.

- 1.5 This report to Cabinet summarises the Section 19 Report (appendix A) and provides an update on flood risk management activities as a result of the May 2018 flooding. In addition, this report seeks to establish the approach to providing sandbags to affected residents while seeking authority to pursue internal and external funding through the Environment Agency where schemes can be justified for flood alleviation schemes.

## **2. Recommendations**

- 2.1 That Cabinet, in noting the content of this report, approve the publication of the Section 19 Flood Investigation Report (appendix A).
- 2.2 That Cabinet, in consultation with the Director for Economy and Environment and the Portfolio Holder for Clean and Green, explore opportunities for internal and external funding sources through avenues such as the Environment Agency by submitting applications to secure such funding in order to alleviate flooding risk issues identified.
- 2.3 That Cabinet, in consultation with the Director for Economy and Environment and the Portfolio Holder for Clean and Green, support the development of a 'Flood Incident Plan' setting out aims, objectives and roles for the Council and its partners before, during and after a flood event.
- 2.4 That Cabinet, in noting the content of this report, approve that sandbags are held by the Council for the use of the Emergency Services only and provided for by Tarmac Trading Limited through the Highway and Infrastructure Services contract (starting 1 April 2019).

## **1. Report detail**

### What is the Flood and Water Management Act 2010?

- 3.1 The Flood and Water Management Act 2010 (the Act) is intended to provide for better, more comprehensive management of flood risk for people, homes and businesses. Flood events can happen at any time and climate change projections suggest that extreme weather will happen more frequently in the future.

- 3.2 The FWMA 2010 imposes a statutory duty of co-operation between flood risk management authorities (This would include adjoining Local Authorities, The Environmental Agency, Severn Trent) . Furthermore, the act LLFA and the Environment Agency with powers to request information required in connection with flood risk management functions.

#### What is the Council's Role under the FWMA 2010?

- 3.3 Aside from the Council's co-ordination role, as LLFA, it has duties under the FWMA 2010 to formally investigate and report on locally significant flood events.
- 3.4 To trigger formal investigation under Section 19 of the Act is that a flood event must meet or exceed locally agreed criteria. Thresholds for the requirement of a Section 19 report are locally identified and so can differ between LLFAs. The approach follow by the Council in relation to its Section 19 duty of the FWMA 2010 is consistent with that currently employed by other local authorities and in particular, the Black Country Local Authorities. For consistency the Council has adopted the same thresholds as stated in the Local Strategy For Flood Risk Management – The Black Country (Issued October 2015) that broadly comprise:
- An event where five or more residential properties, or two or more non-residential (industrial/commercial) properties have been internally flooded.
  - An event where a flooding problem is recurring and is supported by records or anecdotal evidence as having occurred more than once in a 10 year period for any given location.
  - An event where threat to life and/or threat of injury or harm has occurred.
  - An event which affects an area or community with a concentration or high proportion of vulnerable people.
  - An event which impacts on critical infrastructure (water, sewage treatment, electricity/gas distribution, telecommunications and the strategic transport network) in excess of 12 hours before restoration of service.
  - An event which impacts on essential services (emergency services, NHS, local or central Government services) in excess of 12 hours before restoration of service.
- 3.5 It is important to note that LLFA duties under the Act are different to those where the Council is the Local Highway Authority. As Local Highway Authority the Council is responsible for providing and managing highway drainage (gullies and associated infrastructure) and roadside ditches while ensuring that road projects do not increase the potential of flood risk.

#### What is the Section 19 Flood Investigation Report?

- 3.6 The Section 19 Flood Investigation Report (appendix A) provides detailed information on the 27 May 2018 flooding where over 120 properties were affected by internal flooding.

- 3.7 As The Section 19 Report has been produced as a result of on-going investigation and engagement with flood risk management authorities (Environment Agency and Severn Trent Water) and presents the findings of the investigation. The Section 19 Flood Investigation Report analyses the affected area and its flood history and provides a summary of all of the information gathered during the investigation. Where possible it identifies possible flood resilience actions that could be taken to prevent reoccurrence.
- 3.8 In noting the content of this report, and Section 19 Flood Investigation Report (appendix A), it is recommended that Cabinet approve the report and its publication on the Council's web pages.

#### What flood event occurred during May 2018?

- 3.9 On the 27 May 2018 the weather was characterised by warm, humid conditions, with a south-easterly weather front and localised thunderstorms accompanied by intense rainfall.
- 3.10 The whole borough was affected by rain fall but some areas were particularly affected by the localised intense rainfall such as Streetly, Aldridge, Bloxwich and Willenhall. In addition Members will recall the tragic incident that happened on the A461 Lichfield Road, Rushall on the evening of 27 May 2018.

#### What actions did the Council take before and during the May 2018 floods?

- 3.12 The Council receives weather warnings from the Met Office and on receipt of this event issued instruction to its highway maintenance contractor, Tarmac Trading Limited, to:
- Have available a Duty Officer and Operative on call and prepared for potential flooding
  - Inspect known high risk gullies in problematic locations; this would include inspection of gullies to ensure they are clear of debris as well as clearing any watercourses
  - Be on standby to distribute sandbags as required and have additional bags and sand in store
  - Provide an additional duty driver on standby who would be equipped with temporary road closure signs and additional sandbags
  - Place the gully emptying vehicle on standby available for use if required
- 3.13 During the intense rainfall the Council, through Tarmac Trading Limited supported the emergency services in closing flooded roads.

#### What actions did the Council take after the May floods?

- 3.14 Following the event in May 2018 the Council undertook to clear known hotspots where debris may have collected around the trash screens (in watercourses) along with locations where soil and other debris was washed onto the highway. In addition, colleagues from Clean and Green provided support to residents in some areas with clean up and disposal of flood damaged property (furniture and carpets).

3.15 In addition to the above the Council has:

- Reviewed its gully and street cleansing programmes/frequencies to increase the maintenance frequency in susceptible areas where there is a risk of surface water flooding
- Continued to organise multi-agency meeting to discuss incidents and exchange information, lessons learnt and actions and improvements for the future.
- Reviewed the information provided on the Council's website
- Encouraged residents to share information on flooding incidents with the Council
- Worked with available budgets to maximise opportunities to seek and secure additional external grant funding to facilitate drainage improvements and flood alleviation works
- Continued to provide support and advice to the community and businesses on flood related matters

3.16 To continue with this it is recommended that Cabinet, in consultation with the Clean and Green, explore opportunities for internal and external funding sources and submit applications to secure such funding in order to alleviate flooding risk issues identified.

Cabinet will be aware that considerable investment is already being made into gully cleansing and in 2018/19, an additional investment of £200k was approved taking total revenue budget to £318k. Whilst a reduction was proposed in 2018/19 by the sum of £72k this was subsequently scrapped and for 2019 /20 there is a budget allocation for £400k

Cabinet will also be aware that grant funding has been secured from the Environmental Agency (EA), through the Trent Regional Flood & Coastal Committee (TRFCC) for investigating the culvert under Tower Street the sum of 25K for the initial investigation and a further investment of £200k for remediation. Additional bids will be made as schemes are identified.

#### Why has it taken so long to prepare the Section 19 report?

3.17 In order to obtain a clear understanding for the cause of flooding and mitigation measures that could be bought forward to reduce or eliminate future events has taken time. This has been further complicated by engagement with other authorities who are working to their own pressures and timelines. In preparing the Section 19 Flood Investigation Report the Council has:

- Undertaken investigation and site visits to determine ownership of associated assets
- Distributed questionnaires to residents in the affected areas to obtain information relating to the event that they can recall or may have observed
- Undertaken detailed engagement with many of the affected residents in order to understand the reason for flooding
- Contacted partners to arrange for surveys to be undertaken which in many cases has involved preparation of reports of that survey

- Worked with partners such as Severn Trent Water, Environmental Agency, and Contractors to determine potential solutions

#### What solutions has the Council bought forward following the flooding?

- 3.18 While water authority improves and maintain drainage infrastructure, the Council is responsible for highway drainage systems adopted highways maintainable at public expense . In most locations across the borough the Council's highway drainage system utilises the water authority owned system which can present operational difficulties. Working with partners, the Council has arranged joint inspections for a number of sites to ascertain the potential causes of flooding while being mindful of the intense rainfall. Where blockages either in the gullies or the main drainage system were identified these were cleared so as to allow a full condition survey to be undertaken.
- 3.19 This collaborative approach has resulted in the Council organising residents meetings with the relevant authorities in some locations. In other locations joint inspection and assessment is resulting in the opportunity for improvements in the drainage system for increased capacity as well as instigating much needed maintenance and repair in some areas. Officers will continue to utilise this partnership approach as it develops potential solutions in other flood risk locations.

#### What is the Council's position on providing sandbags?

3.20 The Council has no formal duty to provide sandbags but it recognises that it has a and as a result , limited stock of sandbags will be available to supply in the event of flooding as detailed in the following guiding principles:

- The use of sandbags will be to protect (in order of priority):
  - life
  - critical infrastructure
  - and buildings
- The distribution of sandbags will be co-ordinated by the Emergency Services working with the Council.
- Sandbags will be used to protect the fabric of properties rather than damage to outbuildings and/or gardens.
- Sandbags will not be issued directly to the general public
- Due to the risk of contamination, the Council will collect and dispose of any sandbags it places
- The distribution of sandbags will be co-ordinated by the Emergency Services working with the Council.

3.21 The Council is unable to maintain large stockpiles of sandbags for the protection of private residences for the following reasons:

- Sandbags have a limited shelf life
- Sandbags provide limited protection in the event of a flood and often their correct placement is critical
- Sandbags are most effective when placed before a flood event. In most cases it is difficult to arrange transportation and placement at a location quickly enough to be effective

- 3.22 In noting the above, it is recommended that Cabinet approve the approach outlined above that sandbags are held by the Council for the use of the Emergency Services only and provided for by Tarmac Trading Limited through the Highway and Infrastructure Services contract (starting 1 April 2019).

#### How will the Council respond to future flood incidents?

- 3.23 This will be outlined in the emerging flood incident response plan which is currently being prepared by the Resilience Team; in the meantime the Council will continue to respond to flood incidents by:
- closing roads
  - setting up diversions
  - providing sandbags (in line with the approach above)
  - Cleanse road gullies on receipt of amber weather warning in problematic locations
  - Cleanse road gullies following flood event in problematic locations
  - Review street cleansing frequency in high leaf fall areas where they are located in problematic locations

#### What are the next steps?

- 3.24 Working with partners, the Council will continue to explore opportunity to bring forward flood alleviation measures where it is able to do so.
- 3.25 The Council will continue to develop a 'Flood Incident Plan' that will comprise a review of the known flood hotspots to further refine incident planning pre and post flood event. It is recommended that Cabinet, in consultation with the Director for Economy and Environment and the Portfolio Holder for Clean and Green, support the development of a 'Flood Incident Plan' setting out aims, objectives and roles for the Council and its partners before, during and after a flood event. Approval of the Plan will be subject to a future Cabinet report.

### **4. Council Corporate Plan priorities**

- 4.1 The development of a Flood Incident Plan will assist in identifying know risk areas so agencies such as the Environment Agency and water authorities can work together in preventing or mitigating against flooding to:
- Protect business from adverse disruption and the risk of flooding by supporting business to thrive and support local people into work.
  - Ensuring property and transportation are not affected by flooding which will improve health and well being, including independence for older people and the protection of vulnerable people.
  - Protect communities from flooding events will help create safe, sustainable and inclusive communities and
  - Protect schools and supporting infrastructure from flooding risks which will help towards improved Learning and the Life Chances for Children and Young People.

## **5. Risk management**

5.1 Other than the risks of flooding which is beyond the direct control of the Council, there are no risks identified from the recommendations contained in this report.

## **6. Financial implications**

6.1 The Council has been using Staffordshire County Council to provide advice and assistance with the role of LLFA as required since May 2014.

6.2 The services to carry out the Council's duties under the Act are funded from grant funds provided by DEFRA along with Council revenue funding.

## **7. Legal implications**

Local Authorities are the LLFAs for the purposes of the FWMA 2010 and have the lead responsibility for managing the risks of flooding from surface water, groundwater and ordinary watercourses (which excludes main rivers managed by the Environment Agency (EA) within their area.

Under s.9 of the FWMA 2010 a LLFA must develop, maintain, apply and monitor a strategy for local flood risk management in their areas. Local Flood Risks in this context includes:

- surface runoff
- groundwater
- ordinary watercourses (which are watercourses that do not form part of a main river)

The local flood risk management strategy must be consistent with the national flood and coastal erosion risk management strategies for England and Wales under FWMA 2010

Under FWMA 2010, LLFAs must co-operate with other flood risk management authorities, such as the EA, water companies, highways authority and internal drainage boards, and can also share information with and delegate certain functions to other flood risk management authorities.

On becoming aware of a flood in its area, LLFA have a duty under FWMA 2010, s 19 where they think it necessary to investigate:

- which risk management authorities have relevant flood management functions
- whether those risk management authorities are exercising or are proposing to exercise their functions in response to the flood

Where an authority carries out an investigation under subsection 19 ,it must publish the results of its investigation, and notify any relevant risk management authorities.



The Section 19 duty arises as soon as the lead local flood authority becomes aware of a flood in its area. The section 19 duty only obliges the Council to carry out the investigation to the extent it considers it necessary or appropriate. The duty is limited to investigating which are the relevant risk management authorities and whether each of those authorities is proposing to exercising its functions.

In accordance with FWMA 2010, the Council published its local flood risk management strategy in October 2015 entitled 'Local Strategy for Flood Risk Management The Black Country' includes

- The risk management authorities in the authority's area;
- The risk management functions that may be exercised by those authorities;
- The objectives for managing local flood risk;
- The measures proposed to meet those objectives;
- How and when the measures are expected to be implemented (action plan);
- The costs and benefits of those measures, and how they are to be paid for;
- The assessment of local flood risk;
- How and when the strategy is to be reviewed; and
- How the strategy contributes to wider environmental objectives.

## **8. Procurement Implications**

8.1 There are no procurement implications identified from the recommendations contained in this report.

## **9. Property implications**

9.1 Other than the flood risk to the highway, there are no property implications identified from the recommendations contained in this report.

## **10. Health and wellbeing implications**

10.1 There are no health and wellbeing implications identified from the recommendations contained in this report.

## **11. Staffing implications**

11.1 There are no staffing implications identified as a result of the recommendations contained in this report.

## **12. Reducing inequalities**

12.1 There are no direct equality implications arising from the recommendations of this report.

## **13. Consultation**

13.1 In preparing this report, the Council has consulted with finance, legal and Clean & Green colleagues in the preparation of this report.

## Background papers

1. Flood Investigation Report May 2018 Section 19 Report – February 2019
2. 'Your Guide to Dealing with Emergencies', West Midlands Resilience Forum
3. Local Strategy For Flood Risk Management – The Black Country (Issued October 2015)

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Simon Neilson  
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1 March 2019



Councillor Harrison  
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March 2019

## Appendix A - Section 19 Flood Investigation Report (Summary)

Area	Actions in future, lead RMA and timescale
ID1: Aldridge Road Elm Tree Road Whitethorn Crescent	Review options to re-divert drainage install attenuation infrastructure (March 2020) Pursue indicative bid from central government funding (ongoing; 2022 at latest) WMBC to continue partnership working with STW
ID2: Walsall Road Pool Green	Any identified blockages in sewers upstream of flood area to be removed. STW and WMBC to work in partnership (March 2020).
ID3: Turnstone Road	WMBC to review gully maintenance
ID4: Valley Road Abbotts Street Ryle Street Chantry Avenue	STW to arrange further checks of sewers WMBC to continue partnership working with STW WMBC to investigate evidence of historic watercourses in area (August 2020) WMBC to further investigate full geographical extent of problem (August 2020)
ID5: Buxton Close	WMBC to continue partnership working with STW WMBC to liaise with Canals and Rivers Trust (August 2020)
ID6: Farmbridge Close Grenville Close	WMBC to work with EA to understand role and impact of Main River culvert (March 2020). WMBC to work with STW and EA to understand dynamics of system (March 2020).
ID7: Kelvin Road	WMBC to further investigate evidence of historic drainage with adjacent landowners (August 2020).
ID8: Edison Walk Stephenson Square	WMBC to further investigate any issues with Ordinary Watercourse (August 2020).

# **Flood Investigation Report**

## **May 2018 flood event**

### **Walsall**

February 2019

## About

This is a report produced under Section 19 of the Flood and Water Management Act (2010)

## Version

<b>Version</b>	2.0	<b>Date</b>
<b>Produced by</b>	Jamie Cooper (Staffordshire County Council on behalf of WMBC)	19/02/2019
<b>Reviewed by</b>		
<b>Approved by</b>		

## Version history

<b>Version</b>	<b>Date</b>	<b>Changes made</b>
1	22/01/2019	
2	19/02/2019	Rainfall return periods better estimated and refined knowledge of settlements flooded

## Abbreviations

EA	Environment Agency
FWMA	Flood and Water Management Act (2010)
IDB	Internal Drainage Board
LLFA	Lead Local Flood Authority
WMBC	Staffordshire County Council
STW	Severn Trent Water
WMBC	Walsall Metropolitan Borough Council
EA	Environment Agency

## References

CEH 2015. The Flood Estimation Handbook (FEH) Online Service, Centre for Ecology & Hydrology, Wallingford, Oxon, UK

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## Summary

This Flood Investigation Report has been produced by Walsall Metropolitan Council (WMBC) fulfilling duties under the Flood and Water Management Act (FWMA, 2010) as the Lead Local Flood Authority (LLFA) for Walsall.

Under Section 19 of the Flood and Water Management Act (2010), LLFAs have a duty to investigate flooding incidents, where it deems it to be 'necessary or appropriate' and determine which organisation(s) have roles and responsibilities and what actions they intend to take. WMBC therefore has a co-ordinating role. Formal flood investigations are undertaken where the Council is generally aware that five or more properties in a locality have been affected by internal flooding (over the threshold (doorstep level) of the property).

The legislation does not place responsibility on the Council to prevent flooding happening again, although the Council will work with all relevant organisations and local communities as far as reasonably possible to reduce the chance of a repeat flood event. Under the Civil Contingencies Act 2004, WMBC also provides an emergency response through the Emergency Planning Team to protect and assist local communities.

On the 27<sup>th</sup> May, the weather was characterised by warm, humid conditions, with a south-easterly weather front and localised thunderstorms accompanied by intense rainfall. Walsall on the whole was affected by this but with some areas particularly affected by localised intense rainfall such as Streetly, Bloxwich and Willenhall. WMBC are aware of approximately 120 properties that were flooded internally in the Borough, with several near misses. Across the Midlands, Birmingham was particularly badly affected.

This report captures information for communities where the Council has been made aware of property flooding. There are a number of Risk Management Authorities (RMAs) that have relevant flood risk management responsibilities and/or functions including:

- Walsall Metropolitan Borough Council including Highways and Lead Local Flood Authority
- Severn Trent Water (STW)
- The Environment Agency (EA)

The identified RMAs, other groups including local flood action groups, the local community, ward members, and landowners, should continue to work together to share information and reports, with the aim of meeting the actions contained in this report.

# 1 Introduction

Walsall Metropolitan Borough Council is a Lead Local Flood Authority (LLFA) with duties and powers for managing flood risk. The Flood and Water Management Act (FWMA) provides that Lead Local Flood Authorities will have a duty to investigate flooding. Section 19 states that:

*“(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 the flood.*

*(2) Where an authority carries out an investigation under subsection (1) it must*

*(a) publish the results of its investigation, and*

*(b) notify any relevant risk management authorities.”*

Following major flood events, it can often be difficult to identify the source of the flooding and with whom actions to help resolve flooding issues may lie. The purpose of Section 19 of the Flood and Water Management Act 2010 is to ensure that, where this uncertainty occurs, LLFAs assist with identifying the source(s) of flooding and notifying those Risk Management Authorities (RMAs) which have responsibilities.

WMBC will undertake a formal investigation for locally significant flood events when one or more of the following criteria are met. This is set out in the Black Country Local Flood Risk Management Strategy, which was approved in February 2015:

- Flooding of 15 people, but no less than 5 properties
- Flooding of 2 businesses
- Flooding 1 critical service or the marooning of one critical service, or
- The flooding of a motorway or strategic road where it is closed for over 2 hours
- Environment Harmful consequence to 1 nationally or internationally designated site or nationally or internationally recognised heritage site

The flooding of more than five properties, two or more businesses and critical infrastructure at a number of locations during the period from the 27<sup>th</sup> to 28<sup>th</sup> May 2018 has therefore triggered Section 19 of the Flood and Water Management Act (2010), leading to the production of this report. This report covers settlements where internal property flooding is known to have occurred. Over 120 properties were flooded in the County, with several near misses. Nothing in this report identifies individual properties that are at risk from flooding.



## 1.2 Roles and responsibilities

The following table provides information on the roles and responsibilities for flood risk management in Walsall. This table is intended to provide a summary only of respective roles in flood risk management and more information is available in [Part 4 of the Local Flood Risk Management Strategy](#). The Local Flood Risk Management Strategy contains a map of the area.

Land and property owners have a responsibility to keep watercourses flowing where they either own land or property next to a watercourse as Riparian Owners and in taking action to protect their own properties. This is not a legal responsibility for Risk Management Authorities, unless they are the landowner.

**Table 1-1 Summary of roles and responsibilities for flood risk management**

<b>Organisation</b>	<b>Operational role</b>
Environment Agency	Main Rivers e.g. Ford Brook, Tame, Reservoirs (regulation role) Flood warning and forecasting
WMBC Council Highways	Highway drainage
WMBC	Ordinary Watercourses (works)
Water Companies (Severn Trent and United Utilities)	Public Sewers
WMBC Emergency Planning Unit	Emergency planning Co-ordinate the Local Resilience Forum (emergency services and emergency responders)
<b>Organisation</b>	<b>Oversight</b>
Lead Local Flood Authority (WMBC)	Surface water Groundwater Ordinary Watercourses (also consenting and enforcement)

## **2 Flood event – May 2018**

### **2.1 Data collection**

Data has been collected from a number of sources, including:

- Information captured by Risk Management Authorities
- Surveys handed out to residents
- Local site visits and surveys
- Community Group Meetings
- Media and social media
- Contact from MPs and Councillors
- Contact from residents and business owners
- Environment Agency analysis of rainfall return periods

It is important to note that this report has been produced 9 months following the flooding occurring, with the intention that it should capture work to date and the planned actions going forward. It should therefore be treated as a snapshot in time and more information is likely to come forward on the areas affected by flooding that will be taken into account as actions are progressed.

### **2.2 Rainfall return periods**

The Environment Agency has analysed the rainfall from the event using both rain gauges and remotely sensed RADAR information that senses how much rain is falling. During intense rain storms, the amount of rain falling can often vary significantly at a local level and so depending on how far a location is from the nearest rain gauge, this data should be treated with caution. Remotely sensed rainfall data can give us a greater coverage of an area, but indirectly measures rainfall intensity and can both over and underestimate the true rainfall depth.

The Environment Agency has estimated the event likelihood expressed as a return period. This is the average interval between rainfall events. For example, a 100-year rainstorm has a 1% chance of happening in any one year. Understanding the rarity of a particular flood event is important so that the flooding mechanisms in affected areas can be better understood. This information can be used to help inform decision making with regards to flood risk management activities.

Figure 2-1 represents a snapshot of the rainfall that fell on 27<sup>th</sup> May affecting Walsall and the wider area. Table 2-1 shows the estimated return period of the rainfall for the worst affected settlements areas of the Borough. There are a number of limitations to this assessment of event rarity and a copy of the full rainfall analysis report is available on request from the Environment Agency.

**Table 2-1 Rainfall return periods for affected areas of the Borough**

<b>Ward</b>	<b>Settlement</b>	<b>Event Rarity based on nearest rain gauge*</b>	<b>Distance to nearest Rain Gauge (KM)</b>	<b>Event Rarity based on remotely sensed data**</b>
<b>Aldridge</b>	Walsall Road/ Pool Green	>500	2.3	85
	Whetstone Lane	200-500	0.5	85
	Broad Meadow	>500	1.4	85
	Redhouse Lane	>500	1.6	85
	Brookfield Road	>500	1.2	85
	Birmingham Road	200-500	1.0	85
<b>Blakenhall</b>	Turnstone Road	>500	1.7	85
<b>Bloxwich</b>	Valley Road/Abbotts Street/Ryle Street/Chantry Avenue	200-500	2.0	35
	Buxton Close	200-500	1.2	35
	Millfield Avenue	200-500	1.4	35
	Fishley Lane	200-500	1.1	35
<b>Leamore</b>	Kelvin Road	25-50	1.9	55
<b>Palfrey</b>	Delves Green Road	25-50	4.1	85
	Mill Road	>500	1.4	85
	Valleyside	>500	1.8	85
<b>Pleck</b>	Primley Avenue	25-50	0.9	55
<b>Rushall</b>	Limecroft Close	>500	0.2	85
	Lichfield Road	>500	0.4	85
	Sherwood Walk	>500	0.4	85
<b>Short Heath</b>	Dryden Close	200-500	2.6	35
	Woodside Way	25-50	2.3	55
<b>Streetly</b>	Thornhill Road	200-500	3.3	70
	Elm Tree/Aldridge Road/ Yew Tree Road/Whitethorn Crescent	200-500	2.2	70
	Boundary Road	2-10	2.8	70
	Bridle Lane	200-500	2.9	70

	Leafy Glade/Thistledown Close/Chestnut Close	200-500	2.3	70
	Inglewood Grove	200-500	2.2	70
<b>Walsall Wood</b>	Barns Close	25-50	0.9	85
<b>Willenhall</b>	Edison Road/Edison Walk	25-50	1.6	55
	BirchTree Hollow	25-50	1.7	55
	Kewstoke Road	200-500	2.7	35
	Conway Crescent	25-50	2.8	55
<b>Willenhall South</b>	Farmbridge	25-50	1.1	55

\*Event rarity classification (1 In n years return period)

\*\*These have been adjusted by the Environment Agency for the area and is based upon the nearest node with rainfall event rarity recorded.

Results based upon FEH methodology and data, CEH (2015)

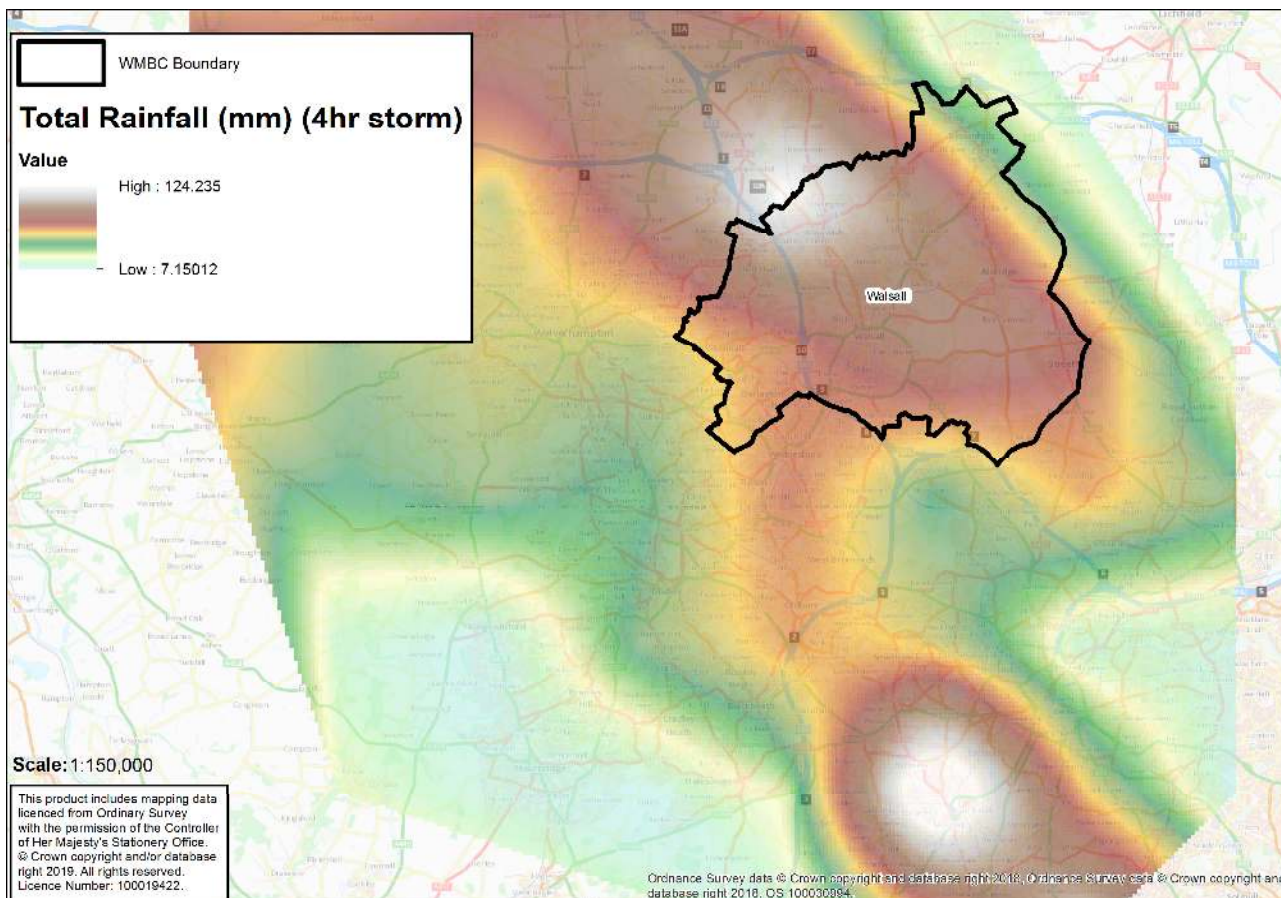


Figure 2-1 Snapshot of 4 hour duration storm over Walsall and surrounding area

## **2.3 Areas affected**

Table 3-1 summarises the causes and impacts of the flooding for the worst affected settlements, based on the understanding at the time this report was produced. Figure 2-1 shows a map of the affected settlements where internal property flooding, near misses and sewer flooding were experienced.

Severn Trent Water carries out its own investigations where the sewer network causes flooding issues (prioritising internal property flooding). Therefore, the report here focuses on areas of surface water or watercourse flooding or where the sewer network is part of a wider drainage issue.

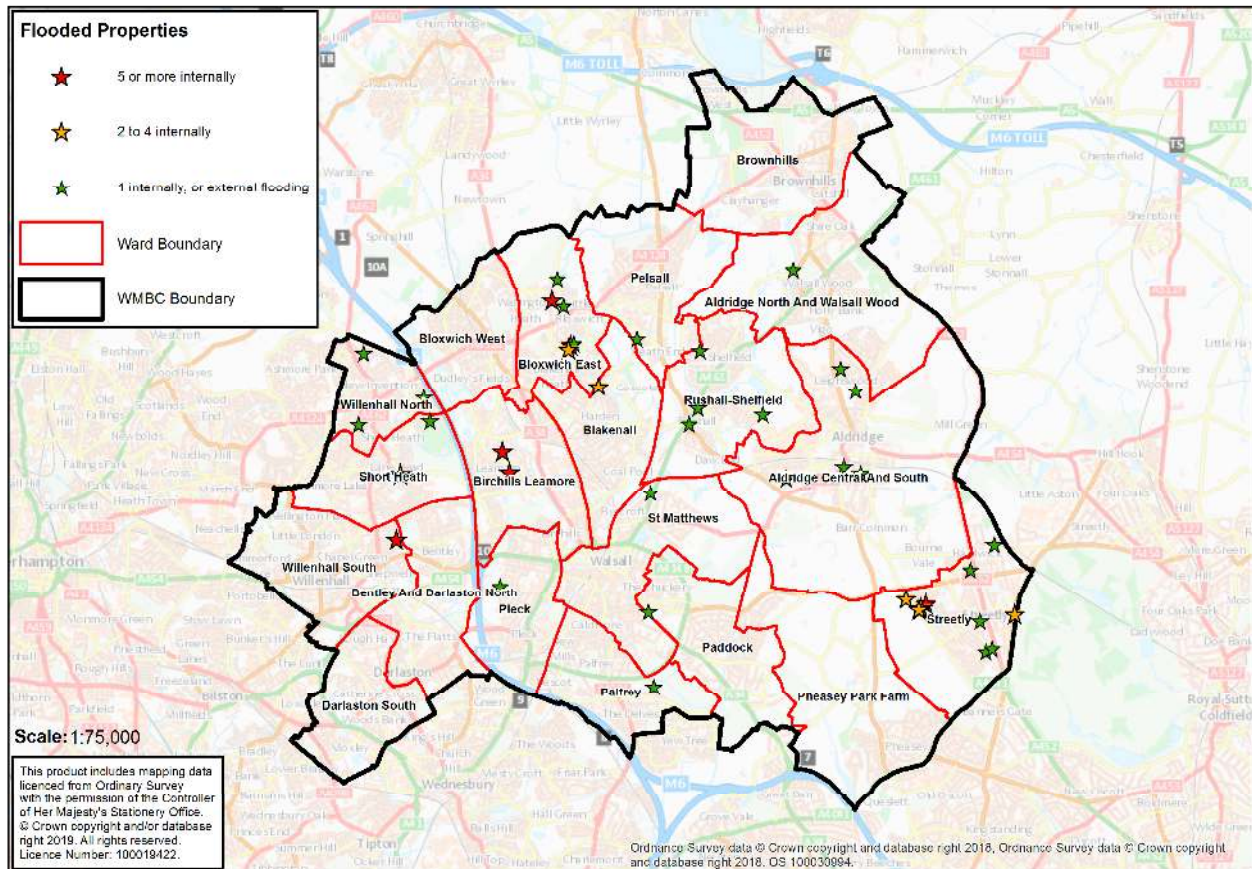
**Table 2-2 Affected settlements/ areas: causes and impacts of flooding**

Settlement	Ward	Properties flooded*	External Flooding	Main sources
Valley Road/Abbotts Street/Ryle Street/Chantry Avenue	Bloxwich	22		Surface Water / sewer
Farmbridge	Willenhall South	20		Sewer/Main River/surface water
Buxton Close	Bloxwich	14		Surface water / sewer
Elm Tree/Aldridge Road/ Yew Tree Road/Whitethorn Crescent	Streetly	12		Surface Water/sewer
Walsall Road/ Pool Green	Aldridge	10		Surface water / sewer
Edison Road/Edison Walk	Willenhall	8		Ordinary Watercourse
Turnstone Road	Blakenhall	6		Surface Water / sewer
Kelvin Road	Leamore	6		Surface Water
Thornhill Road	Streetly	3		Surface Water/sewer
Aldridge Road	Streetly	3		Surface water
Bridle Lane	Streetly	3		Surface Water
BirchTree Hollow	Willenhall	2		Surface Water
Woodside Way	Short Heath	1	1	Surface Water
Boundary Road	Streetly	1		Surface water / sewer
Millfield Avenue	Bloxwich	1		Surface Water/ sewer
Whetstone Lane	Aldridge	1		Surface Water
Kewstoke Road	Willenhall	1		Surface Water
Broad Meadow	Aldridge	1		Surface Water
Limecroft Close	Rushall	1		Surface Water
Redhouse Lane	Aldridge	1		Surface Water
Brookfield Road	Aldridge	1		Surface Water
Lichfield Road	Rushall	1		Surface Water
Sherwood Walk	Rushall	1		Surface Water
Fishley Lane	Bloxwich	1		Surface Water/ordinary watercourse/canal
Primley Avenue	Pleck	1		Surface Water
Leafy Glade/Thistledown Close/Chesnut Close	Streetly		6	Surface Water
Dryden Close	Short Heath		1	Surface Water
Delves Green Road	Palfrey		1	Surface water/sewer
Mill Road	Pelsall		1	Surface Water
Valleyside	Pelsall		1	Surface Water/sewer/ordinary watercourse
Barns Close	Walsall Wood		1	Surface Water/ordinary watercourse/sewer

Birmingham Road	Aldridge		1	Surface Water
Conway Crescent	Willenhall		1	Surface Water
Inglewood Grove	Streetly		1	Surface Water
	<b>Total</b>	<b>122</b>	<b>15</b>	

\*Please note the number of properties here is based upon the best estimate at the time of writing this report and what has been reported to WMBC.

**Figure 2-2 Map of locations affected (note: location approximate)**



### 3 Actions and recommendations

#### 3.1 Actions

As outlined in Section 1, WMBC have a duty under the Black Country Local Strategy for Flood Risk Management to formally investigate flooding when certain criteria are met, for example flooding to 5 residential properties or more. Table 5-1 outlines those actions taken where these criteria have been met. The Table sets out relevant Risk Management Authorities and other interested parties, actions that have been taken to date and those actions planned for the future, with the relevant Risk Management Authority who will lead. WMBC will continue to identify and work to actions where flooding has occurred in areas where the criteria have not been met but this detail is outside the scope of this report.



**Table 3-1 Actions**

Settlement/ Area	Relevant RMAs	Estimated Return Period	Actions to date	Actions in future, lead RMA and timescale
ID1: Aldridge Road/Elm Tree Road/Yew Tree Road/Whitethorn Crescent	WMBC Highways  Severn Trent Water (STW)	1 in 200-500 year  Please note:  Typically, highway systems designed for 1 in 5-year standard  Typically, sewers designed for 1 in 30-year standard	Questionnaires handed out by WMBC.  Site visit and desktop exercises undertaken by WMBC  WMBC reviewed highway gully maintenance  STW carried out CCTV survey. No identified issues.  STW requested hydraulic modelling of surface water system  Indicative bid for capital central government funding	Review option to re-divert gullies (March 2020)  Pursue indicative bid for central government funding (ongoing; 2022 at latest)  WMBC to continue partnership working with STW (ongoing)

Settlement/ Area	Relevant RMAs	Estimated Return Period	Actions to date	Actions in future, lead RMA and timescale
ID2: Walsall Road/Pool Green	<p>WMBC Highways</p> <p>Severn Trent Water (STW)</p>	<p>1 in 200-500 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Questionnaires handed out</p> <p>Site visit and desktop exercises undertaken by WMBC</p> <p>WMBC reviewed highway gully maintenance</p> <p>STW carried out CCTV survey. Cleansed system. Obstructions within sewers noted.</p>	<p>Tree roots in sewers upstream of flood area to be removed. STW and WMBC to work in partnership (March 2020).</p> <p>WMBC to continue partnership working with STW (ongoing)</p>
ID3: Turnstone Road	<p>WMBC Highways</p> <p>Severn Trent Water</p>	<p>1 in 200-500 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Questionnaires handed out</p> <p>Site visit and desktop exercises undertaken by WMBC</p> <p>WMBC reviewed highway gully maintenance</p>	

Settlement/ Area	Relevant RMAs	Estimated Return Period	Actions to date	Actions in future, lead RMA and timescale
ID4: Valley Road/Abbotts Street/Ryle Street/Chantry Avenue	<p>WMBC Highways</p> <p>Severn Trent Water</p> <p>Canals and Rivers Trust</p>	<p>1 in 200-500 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Site visit and desktop exercises undertaken by WMBC</p> <p>Contact with residents</p> <p>WMBC reviewed highway gully maintenance</p> <p>STW cleared blockages</p>	<p>STW to arrange further checks of sewers</p> <p>WMBC to continue partnership working with STW (ongoing)</p> <p>WMBC to investigate evidence of historic watercourses in area (August 2020)</p> <p>WMBC to further investigate full geographical extent of problem (August 2020)</p>
ID5: Buxton Close	<p>WMBC Highways</p> <p>Severn Trent Water</p> <p>Canals and Rivers Trust</p>	<p>1 in 200-500 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Site visit and desktop exercises undertaken by WMBC</p> <p>Contact with residents</p> <p>WMBC reviewed highway gully maintenance</p>	<p>WMBC to continue partnership working with STW (ongoing)</p> <p>WMBC to liaise with Canals and Rivers Trust (August 2020)</p>

Settlement/ Area	Relevant RMAs	Estimated Return Period	Actions to date	Actions in future, lead RMA and timescale
ID6: Farm bridge Close/Grenville Close	<p>Environment Agency</p> <p>WMBC Highways</p> <p>Severn Trent Water</p>	<p>1 in 25-50 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Public meeting held</p> <p>Questionnaires handed out</p> <p>WMBC reviewed highway gully maintenance</p> <p>STW undertaken survey. No evidence of pumping station and tanked storage failing during event. Large sewer catchment draining into system with high return period in upper catchment.</p> <p>EA culvert predicted to be 1 in 100-year capacity</p>	<p>WMBC to work with EA to understand role of Main River culvert (March 2020).</p> <p>WMBC to work with STW and EA to understand dynamics of system (March 2020).</p>
ID7: Kelvin Road	N/A	<p>1 in 50-100 year</p> <p>Please note:</p> <p>Typically, highway systems designed for 1 in 5-year standard</p> <p>Typically, sewers designed for 1 in 30-year standard</p>	<p>Site visit and desktop exercises undertaken by WMBC</p> <p>Contact with residents</p> <p>WMBC reviewed highway gully maintenance</p>	<p>WMBC to further investigate evidence of historic drainage (August 2020).</p>

Settlement/ Area	Relevant RMAs	Estimated Return Period	Actions to date	Actions in future, lead RMA and timescale
ID8: Edison Walk/Stephenson Square	WMBC Highways	1 in 100-200 year  Please note:  Typically, highway systems designed for 1 in 5-year standard  Typically, sewers designed for 1 in 30-year standard	Site visit and desktop exercises undertaken by WMBC  Contact with residents	WMBC to further investigate any issues with Ordinary Watercourse (August 2020).

In line with the Local Flood Risk Management Strategy for the Black Country, information on flooding that has happened will also be used to inform, where appropriate:

- Our understanding of the level of flood risk around the Borough and how we take a risk-based approach to prioritising our resources,
- Our understanding of where watercourses and assets, such as culverts and trash screens have caused particular issues and future maintenance needs. We will work to achieve these with land and asset owners,
- Where we can support communities to understand flood risk and become more resilient to flooding,
- Responses to major planning applications to ensure new development does not exacerbate existing flood risk issues and where possible, carefully planned Sustainable Drainage Systems on new developments reduce flood risk elsewhere,
- Partnership working with other flood risk organisations to take a joined-up approach to flood risk management,
- Work undertaken by the Emergency Planning Department to be more prepared for future flood events, and
- The future programme for flood alleviation schemes.

## **4 About this report and disclaimer**

This report has been prepared as part of WMBC'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 WMBC when preparing this report, including, but not limited to those key assumptions noted in the report, including reliance on information provided by others.

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

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