Flood Risk Management Annual Report

Report of the Assistant Director Highways and Infrastructure - May 2024

1. Introduction

A scrutiny review of Flood Risk Management (FRM) and Response was published in June 2010. This set out 12 recommendations which were completed in 2010. The Flood and Water Management Act 2010 passed into law conveying new responsibilities and making Birmingham City Council (BCC) a Lead Local Flood Authority (LLFA). This report highlights progress in addressing these statutory responsibilities and provides an update on other flood risk management related issues.

This report also provides an update into areas for improvement identified in the review of the May 2018 flooding conducted by members of the Sustainability & Transport O&S Committee on 19th July 2018. No major issues were raised at the submittal of the last Flood Risk Management Reports of March 2023 and spring 2022.

This report will also highlight how budgetary changes will likely impact the Flood Risk Management Team's level of service in 2024. In September 2023, the council issued two Section 114 notices as part of the plans to meet the council's financial liabilities relating to equal pay claims and an in-year financial gap within its budget.

1.1 Climate Emergency

Birmingham City Council declared a climate emergency on 11th June 2019, pledging to reduce the city's carbon emissions and fighting against climate change with a goal to become net zero carbon by 2030. The effects of climate change profoundly affect our own city, with increased extreme weather events such as flooding, droughts and heatwaves posing a major risk to life and property.

To assist communities in 2023, the Flood Risk Management team provided sandbags and replenished hydrosnakes (similar to lightweight sandbags) to formal Flood Action Group and undertook maintenance to high-risk structures / trash screens. Our Engineers and Contractors helped to maintain and undertook works to ensure the eleven large-raised Reservoirs on Birmingham City Council land met statutory requirements and cleansed watercourses in advance of storms or predicted flood events The team actively monitor flood and river levels, either on-site or via cameras and online level gauges, whilst also working with organisations such as the Environment Agency and Severn Trent Water to provide a multi-agency approach to managing flood risk. The team currently offer an out of hours service during nights and weekends, to assist other parts of the Council for urgent drainage and flooding situations.

1.2 Hybrid Working

In 2023, the Flood Risk Management Team has continued to work in an agile and hybrid working style, allowing members of the team to work remotely and meet in an office setting or on-site. This ensures that essential drainage works take place for the BCC Leisure, Bereavement and Housing teams, as well as for external partners such as the Environment Agency. In the event of a flood, available staff members can fulfil their roles to ensure contingency measures are taken. If required, the team can double-staff the out-of-hours service to provide essential cover, for storm events and predicted flood events.

A Flood Risk representative has been able to actively contribute as part of the Environment Cell, COVID Recovery Group and Commonwealth Games preparation to aid decision-making processes and addressing environmental issues. The internal collaboration among the Flood Risk Team, Council Teams and Kier provided effective response to both heavy rainfall and minor flood events. The Environment Cell structure allowed for efficient out-of-hours communication and requests for help and assistance, from other teams such as the Neighbourhood Street Cleansing and Waste Management teams.

2. Flood and Water Management Act Duties

The following work has been undertaken to fulfil the Lead Local Flood Authority duties under the Flood and Water Management Act.

2.1 Local Flood Risk Management Strategy

The Local Flood Risk Management Strategy, October 2017, which states the strategic direction for the management of flood risk across Birmingham is being updated for 2024 to reflect budgetary decreases and new guidance and legislation. The update will take account of the Flood Risk Management Plans, climate change allowance guidance and proposals to add SuDS Approval Body duties to the Lead Local Flood Authority – which although envisaged to take place in 2024, looks now to be implemented in 2025 onwards. It will also reflect the recent flooding events of June / July 2023, the future pipeline of schemes and states Flood Risk Management's intent and drive to work with partners to address, manage and mitigate against all sources of flood risk. Reference will be given to the Environment Agency's National Strategy, guidance from the Local Government Association and the Flood Risk Management Plans (FRMPs) and River Basin Management Plans (RBMPs).It will also include changes to the climate change allowances and will be supported by an updated Habitats Regulation Assessment and Strategic Environmental Assessment, in light of DEFRA and Natural England advice.

By continuing and strengthening collaborative working arrangements to improve flood risk management, Birmingham City Council as Lead Local Flood Authority can look to bridge funding gaps with Grant in Aid, Local Levy and/or private contributions to help deliver schemes / drainage improvements and share best available data and good practice - supported by partners, water and sewerage undertakers and other risk management authorities.

2.2 Cooperation with other Flood Risk Management Authorities

The Lead Local Flood Authority continues to cooperate extensively with other risk management authorities (RMAs) at various levels as established in the 3-tiered flood risk management governance structure. The BCC Flood Risk team also attend neighbouring Councils' partnership meetings and Environment Agency LLFA Networking groups whilst having representation on the Trent Regional Flood and Coastal Committee (RFCC), the Trent RFCC Financial Sub Committee (RFCC FSC) and the CIWEM West Midlands Committee.

2.2.1 Strategic Flood Risk Management Board

The Strategic Board last met in January 2023 and was well attended by members of the Flood Risk Management Team, Assistant Director of Highways, Severn Trent Water and the Environment Agency. The Strategic Board acts as the focus and political driver for partnership activity and allows for updates and progress from partners. Highway flooding and the impacts of intense rainfall events on watercourses, sewers and drainage infrastructure from 2023 were discussed and allows a forum for ourselves and other risk management authorities to raise issues of note.

2.2.2 Birmingham Water Group

The Birmingham Water Group is the officer led partnership working to deliver flood risk management improvements across the city, and has representation from the Flood Risk Management Team, Severn Trent Water, Kier and the Environment Agency. The Water Group met in November 2022 and then held an extraordinary meeting in July 2023 to discuss the June and July flood events. Partners such as Kier, Severn Trent Water, and the Environment Agency shared data and agreed that a Section 19 investigation would take place.

2.2.3 Project Groups

The Lead Local Flood Authority has worked with partners on a number of projects as follows:

River Rea Partnership

The Rea Catchment Partnership, led by the Environment Agency has over the past few years completed construction of two flood risk management schemes in the city:

- **Selly Park North Flood Risk Management Scheme / BCC Surface Water Improvements**

The Selly Park North flood risk management scheme has been fully operational since 2019 and the Environment Agency worked in partnership with Calthorpe Estates, Birmingham City Council and other organisations to help reduce the risk of flooding.

The area of Selly Park North has a history of flooding from the Bourn Brook severely affecting the area in 2008 and more recently in June 2016. The scheme reduces flood risk to 150 properties in the area. The scheme involved deepening and widening an existing flood water storage area near the Bourn Brook Walkway on Harborne Lane, Harborne. This increased the capacity of the storage area and offered wildlife and ecology improvements. Flow improvement works were also carried out at the Pebble Mill development site creating an overland flow route to direct flows into a new bypass culvert running underneath the Pershore Road. This has reduced the risk of fluvial flood water getting onto the highway and into properties. The Environment Agency, Severn Trent Water and Birmingham City Council are continuing to look at the residual risk of surface water flooding for additional surface water improvements in this area whilst working with the Local Flood Action Group (FLAG). Discussions are ongoing with both the FLAG, the EA and STW regarding how best to attract funding and to implement drainage improvements along the Pershore Rd and additional gullies have been placed on adjacent roads to help mitigate surface water flood risk.

Image taken from https://telemetry-data.com/open?profile=SPNFA **showing the Bourn Brook**

- **Selly Park South Flood Risk Management Scheme**

Construction completed on the Environment Agency's £2.4 million flood risk management scheme in Selly Park South in 2017. The Environment Agency worked in partnership with St Andrew's Healthcare, Birmingham City Council and other organisations to develop the Selly Park Flood Risk Management Scheme to help reduce the risk of flooding.

The area of Selly Park South has a history of flooding from the River Rea, most notably in 2008 when some residents were forced to move out of their homes as a result of flood damage. This scheme will help protect more than 200 properties in the area from fluvial flooding. The Environment Agency, Severn Trent Water and Birmingham City Council are looking at the residual risk of surface water flooding.

The scheme included the construction of an embankment on public open space, immediately upstream of Dogpool Lane bridge to help hold water during extreme heavy rainfall events. Bank levels were also raised downstream of the bridge to reduce the risk of flood water getting into properties. Following heavy rainfall events which impacted Selly Park South on the 23rd and 24th November, a number of dwellings at very high surface water risk are being considered for possible Property Flood Resilience Measures within this 6-year programme. Discussions are ongoing with the Environment Agency on how best to attract funding and for their guidance on already claimed outcome measures (i.e. properties already better protected against flood risk).

- **First Avenue Flood Risk Management Scheme (Pebble Mill playing fields)**

First Avenue flood risk management scheme is the final fluvial scheme to be delivered in the Selly Park Flood Risk Area (Continue to investigate, and will if viable progress, a flood risk management scheme in Selly Park (First Avenue) – Flood Plan Explorer (data.gov.uk) The area of Selly Park has a history of flooding from both the River Rea and the Bourn Brook. This scheme sited within Pebble Mill playing fields reduces flood risk to almost 100 properties from the River Rea. The scheme is intended to operate by directing water that has entered the playing fields back into the River Rea by constructing a flood embankment in the open space. In addition, conveyance within the River Rea itself has been improved through the removal of four weirs which were keeping water levels artificially high in the area. Removal of these weirs will also provide significant habitat and biodiversity improvements. Construction of the embankment completed late 2023 and is therefore operational. Final reprofiling of adjacent ground and subsequent landscaping will take late place Summer / Autumn 2024 with the playing fields returns to public use in 2025.

The **River Rea Partnership** is also currently undertaking the following strategic study:

- **Upper Bourn Brook Study**

The Environment Agency, Severn Trent Water and Birmingham City Council are working together on a catchment-wide study to understand the flood risk and develop flood mitigation options for the upper Bourne Brook catchment. The study covers the catchment upstream of Harborne Lane, Selly Oak, taking in Quinton, Woodgate, Bartley Green and Harborne. The study is still ongoing with hydraulic modelling and high-level optioneering. Once the study is complete, the Environment Agency is to prepare a Strategic Business Case with a view to securing funding.

- **Lower Rea**

The Bourn and Lower Rea Scheme has now been separated into two projects, largely due to the significant funding gap on the Lower Rea element of the scheme. The Bourn scheme has been designed for the protection of the Bournville and Stirchley area and does not support development in the Rea Valley Urban Quarter and Digbeth. The Lower Rea Scheme which is potential flood storage at Calthorpe Park is designed to reduce risk to Highgate and Digbeth. We plan to complete most of the Outline Business Case tasks to get the Lower Rea scheme in a position to progress

should partnership funding contributions become available. The Environment Agency is continuing to work with partners, including Birmingham City Council, West Midlands Combined Authority, Severn Trent Water and private businesses and developers to explore opportunities for delivery and funding contributions.

- **The Bourn**

The Bourn Flood Risk Management Scheme is at the Outline Business Case development stage (funded to date by Government Grant in Aid and contributions via private businesses) to complete the appraisal works and outline design of the preferred option. This stage is likely to take a further 12 months and is likely to involve a series of flood storage areas on The Bourn. The area has suffered extensive flooding in 2008, 2012, 2016 and 2018. We started wider community engagement in January 2024, based on the concept designs, and there are some concerns around the impact to the park areas given their heritage and that they are well used. We have explained that the project is at an early stage, the designs will change, and we will continue to engage with stakeholders and residents as the plans progress to incorporate the needs of the community. The next tasks include completing the river model options testing and starting the ground investigations. For further information please see our project website, which is regularly updated, Bourn Flood Risk Management Scheme - Environment Agency - Citizen Space (environment-agency.gov.uk).

The River Tame Flood Risk Management Strategy

The River Tame Flood Risk Management Strategy sets out the Environment Agency's strategic approach to flood risk management on the River Tame by considering opportunities to manage flood risk across a wide area, while providing environmental benefits. The Environment Agency is currently delivering two schemes under this strategy.

- **Perry Barr and Witton Flood Risk Management Scheme**

A key part of the River Tame Strategy is the implementation of the Perry Barr and Witton flood risk management scheme was delivered over 2 phases. There are approximately 1,400 properties at risk from this section of the River Tame, including 950 residential properties. Phase 1 of the scheme was completed in spring 2017, bringing new flood walls, flood gates and flow conveyance improvements from Brookvale Road in Witton down to Gravelly Park Industrial Estate in Aston. The improved flood wall and flood gates in Witton successfully stopped properties from flooding in May 2018. Construction work for Phase 2 started early 2018 and completed in spring 2023. This work increased flood storage capacity in the Sandwell Valley from 575,000m3 capacity to 1,775,000m3. Birmingham City Council made a contribution of £600k to this scheme in early 2019. The works included the improvement of existing habitats, including grasslands, hedgerows and planting of over 20,000 trees. The automated scheme has since operated during both Storm Babet and Storm Henk.

- **Bromford and Castle Vale flood risk management scheme**

The Bromford Flood Risk Management Scheme (FRMS) aims to reduce the risk of flooding from the River Tame. The scheme extends over 4.5 km from the River Rea, through Bromford and Castle Vale, and downstream to the M42 crossing at Water Orton. The scheme will better protect more than 900 homes and businesses from fluvial (river) flood risk. The Environment Agency have had challenges in delivering the scheme, which have led to significant delays in completing the works. The scheme involves raising flood walls and constructing new ones as well as building earth embankments. A cycling route has been provided along the south bank linking up with the existing networks at Bromford Road and Chester Road.

The Main body of the flood defence works has now been completed and properties in the area now have a lower risk of flooding. The Environment Agency are finishing works to address a collapsed section of river wall at the Prologis Park area and to install Water Framework Directive improvements. The current program has a completion date at the end of the summer 2024.

River Cole

The River Cole modelling led by the Environment Agency has recently been updated to incorporate recent partner studies and update the hydrology. Our framework consultant, Jacobs, have completed a high-level economics assessment of the model results. Initial outputs show that there is limited flood risk along the River Cole and that a capital scheme to alleviate flooding along the watercourse is not likely to be viable or affordable. The Environment Agency will continue to look for opportunities to develop alternatives such as Property Flood Resilience (PFR) and Natural Flood Management (NFM) in the catchment, working closely with partners around funding and delivery.

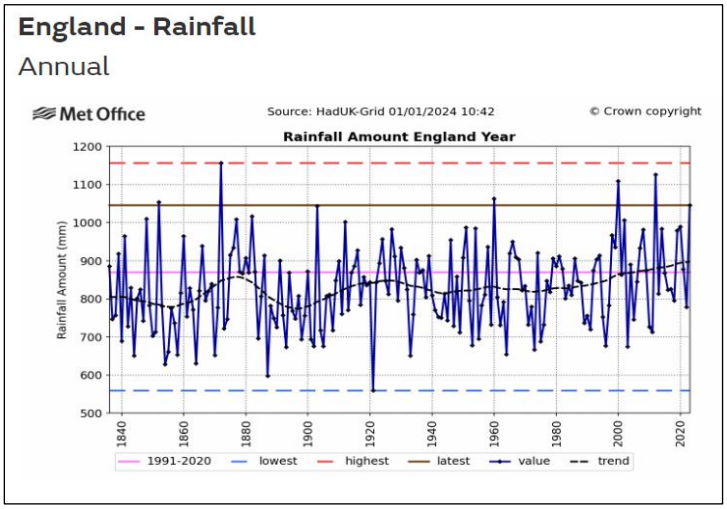
2.3 Investigation and Publication of Reports of Flooding Incidents

2.3.1 Significant Flood and weather events

The Met Office has recently updated to the latest World Meteorological Organization climate averages for the period 1991 - 2020. The Met Office noted that "*2023 will go down as one of the five warmest years on record for the UK …This means the five warmest years in the UK series from 1884 include 2020, 2022 and 2023 – an indication of just how fast our climate continues to change*"[1]

2023 was also one of the ten wettest years on record since the series began in 1836.

On average, the UK recorded 111% of the 1991 – 2020 annual average rainfall – with some areas receiving more than a quarter more rainfall than normal. This led to hundreds of drainage issues and enquiries being received across the City, affecting homes, businesses, highways, urban and green spaces.

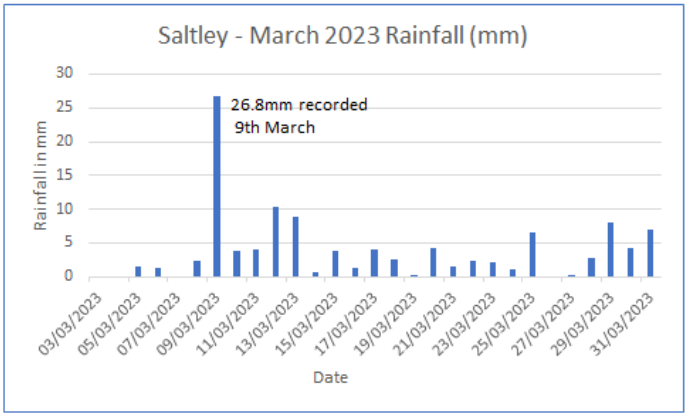


January 2023 had an unsettled start with prolonged heavy rain from the 10th in South Wales, with the River Severn overtopping in the south-west Midlands in several places and road and rail travel across Shropshire and Herefordshire impacted by flooding and surface water. February led to a slight reprieve, as was noted to be the driest second month since 1993 with 20% less rainfall than usually expected.

Image taken from: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-temperature-rainfall-and-sunshine-time-series

[1] Official blog of the Met Office news team taken from https://blog.metoffice.gov.uk/2023/12/28/2023-in-weather/

Whereas March started with cold weather and snow, it also brought bands of heavy rain, with 112.6mm (4.4inches) recorded rainfall at the Birmingham Saltley rain gauge across the month period. Overall, the UK experienced 155% of average rainfall and it was the sixth wettest March recorded since 1836. Thursday 9th March recorded 26.8mm of rainfall, just over an inch of rainfall over mid-late afternoon.



April was relatively calm with high pressure, however in other nearby areas, high winds led to a section of the M4 in South Wales being shut. The month of May started the thunderstorm season with severe weather warnings issued between 7th and the 11th, a landslip was reported to have blocked the Basingstoke to Winchester rail line and parts of the M11 in Essex were closed due to standing water.

Sunday 11th June 2023

After hot and humid weather conditions reaching approximate 30°C (86°F) in parts of the southern England, the UK Health Security Agency and the Met Office issued a Level 3 Amber heat warning for the East of England. A yellow weather warning was also issued by the Met Office for thunderstorms on Sunday 11th June, alongside Flood Alerts issued by the Environment Agency for the River Cole, River Rea and Upper Tame and a Flood Warning for the Bourn at Bournville.

From 7pm until 10pm, high intensity rain over central and North Birmingham led to 6+ properties and a school flooding internally. Surface water flooding and surcharging sewers were noted, as highway and drainage systems were overwhelmed by a high intensity, short duration rainfall. The Met Office reported that over 20,000 lightning strikes were recorded across the UK during the event.

View overlooking St. Catherine's Church, Bristol Street, Birmingham

Areas across Erdington, Sutton Coldfield and Walmey were adversely affected. The following week also continued to remain humid with yellow thunderstorm alerts covering large parts of western areas, Wales and Western Scotland. 60-80 mm of rain was forecasted, with maximum temperatures of 29°C.

On 14th June, a burst water main flooded Aston Hall Road / Lichfield Rd in Aston and affected water supplies in the surrounding areas.

Sunday 18th June 2023

Preceded by hot and humid weather, temperatures reached 27°C across the West Midlands with thunderstorm alerts covering much of the country. On the morning of Saturday 17th June, the

Environment Agency issued Flood Alerts for the Upper Tame, Upper Tame at Sandwell Valley, River Cole and River Rea. There was uncertainty over the amount of rainfall expected and the exact location of where thunderstorms and heavy rain would fall.

At approximately 4pm, rain stopped play at Edgbaston for Day 3 of The Ashes First Test: England v Australia as 15mm of rain fell in 30 minutes. Approximately four properties and two businesses flooded internally with a significant number of near misses and extensive, but short-lived, highway flooding.

Further Flood Alerts were issued on the 22nd June for the River Cole, River Rea, Upper Tame given the continued weather warnings of heavy rain. Between the 9th and 25th June 2023, it was noted to be the warmest June on record since 1884, with a large number of lightning flashes concentrated over the west Midlands and Wales.

Saturday July 8th 2023

In a continuation of weekend thunderstorms, the MET Office issued a Yellow Weather Warning covering a large area of the Midlands including Birmingham. Flood Alerts were issued 8am Saturday morning for the Upper Tame at Sandwell Valley, River Cole, River Rea and Upper Tame. Again, there was uncertainty over the amount of rainfall expected and the exact location of where thunderstorms and heavy rain would fall.

At 6pm, the Redditch and Bromsgrove Lickey Hills rain gauge started to record intense rainfall – by 7pm it had recorded 20mm. Thunderstorms and heavy rain reached Birmingham just after 7pm, with lightning strikes recorded on the M42 quickly moving northwards. By 7:30pm, calls, messages and emails were being received by City Council Control Room, Flood Risk Duty Officer and other members of the Team. The Aston Expressway (A38) was quickly inundated, Residents sent in property flooding notifications requesting assistance and near Sutton Coldfield, a member of the Team called the emergency services after witnessing an individual trapped in their car as floodwater inundated the electrics. At 19:58pm, a Flood Warning was issued for the Bourn at Bournville, noting that water levels had risen swiftly at the Bournville Woodbrook Road river gauge and that flooding of property could be imminent. River levels were envisaged to continue rising over the evening. By 19:58pm, Severn Trent issued an alert on their website noting that "*there is a possibility of flooding of rivers and streams, on highways and around homes*"[2].

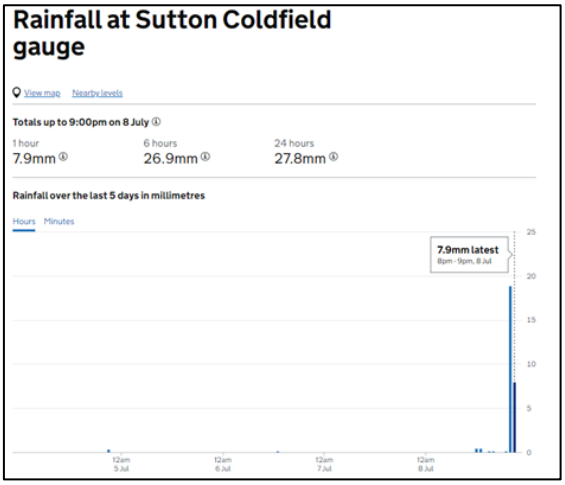
BCC Control Room advised that they were inundated with calls across the whole city. Roads and streets were flooded, including Birchfield Island underpasses. Predicted rainfall data from Met Office Hazard Manager suggested the storm moving north and east of the city, with light rainfall after the storm until 11pm and dry weather overnight.

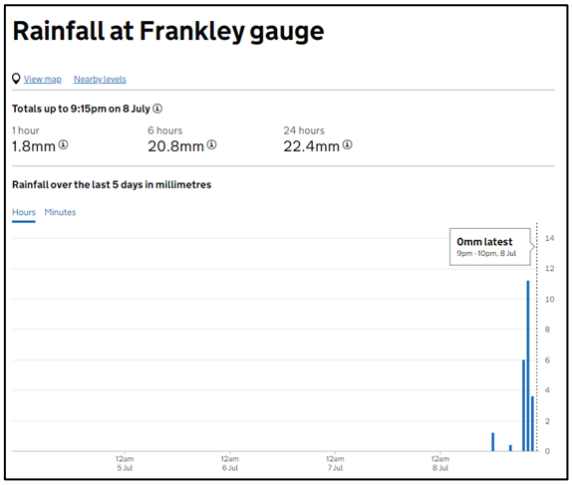
75+ properties and premises flooded within 45 minutes. The A38, underpasses / under bridges and major roads were inundated with water. Rivers and watercourses across Birmingham rose swiftly in response to the heavy rainfall and water / drainage systems overwhelmed. Control Room and Kier Highways received 370 emergency calls and the Response crews were dispatched 185+ times over the weekend. The Severn Trent Water incident line was overwhelmed with calls.

Many parts of Birmingham were difficult to access due to the extent of surface water flooding - sandbags and hydrosnakes proved ineffective due to the speed of onset and sheer volume of water. The Sutton rainfall gauge recorded approximately 25mm within an hour, with similar readings at Frankley. The thunderstorm was intense with significant impacts – no standard drainage system

[2] As shown on Severn Trent Water website - https://www.stwater.co.uk/in-my-area/incidents/

would have accommodated the intensity across such a short period of time. By 8pm, a BCC Flood Risk Contractor advised that rain was easing and that due to the amount of debris on grills and trash screens, that they would then commence clearance works when water levels had dropped and deemed safe to work in, or near, water.





Rain gauges at Sutton Coldfield and Frankley – screenshots taken 9pm on 8th July - https://check-for-flooding.service.gov.uk/river-and-sea-levels

Although the rainfall had abated, the rivers and watercourses had now started to respond – with the real risk of river (fluvial) flooding after the pluvial (surface water) was draining away. As Birmingham is a rapid response catchment, the watercourses respond swiftly to heavy rainfall. At 8:17pm, the Environment Agency issued a Flood Warning for 'Bourn Brook at Selly Oak' and Stonehouse Brook at California, quickly followed by the 'River Rea at Stirchley' and 'River Rea at Edgbaston'. Control Room advised that all crews were in attendance to reported incidents and traffic was stationary throughout the city.

By 9pm, the River Tame had risen by 1.5 metres at Brookvale Road and the River Rea by 1.58 metres at Selly Park. Following this event, over 90 separate flooding occurrences were being investigated by the Flood Risk Management Team.

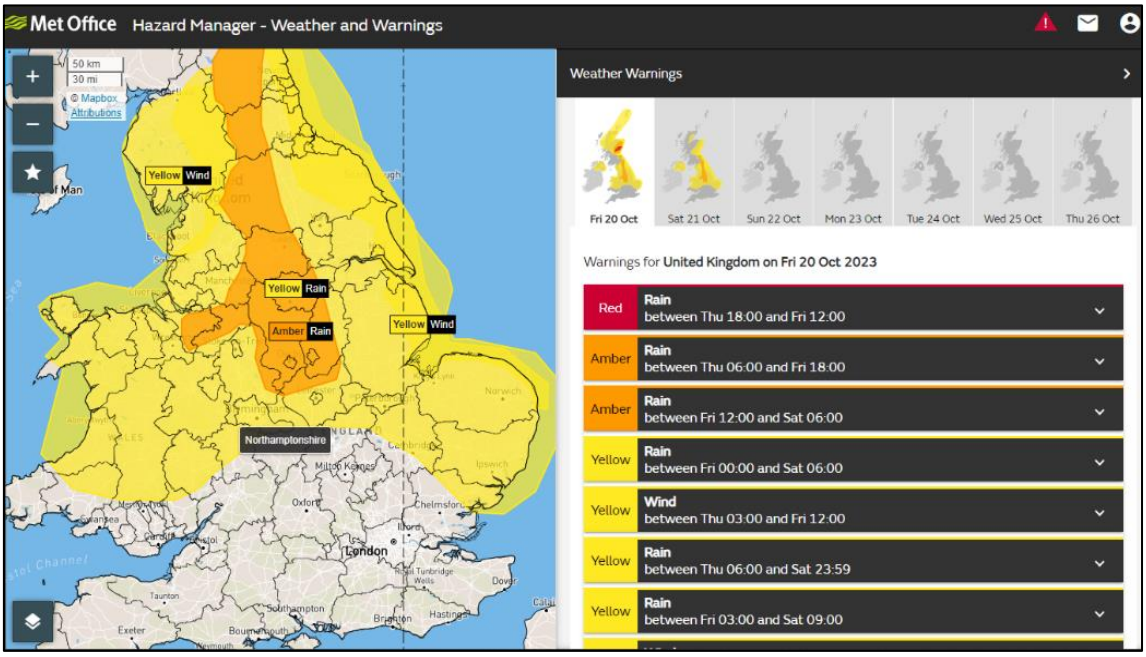
Photograph at Sparkhill, taken by Richard Wren, 8th July 2023

August continued the unsettled summer with Storm Antoni affecting parts of Wales and South-west England and a low pressure system during 25th – 27th August brought heavy rain affecting the North-west. Early September brought a heatwave with temperatures exceeding 30°C somewhere in the UK for seven consecutive days, noted to be the joint-warmest September on record. Although sunshine totals were above average at 112%, torrential downpours also meant that rainfall also exceeded expected totals at 131%.

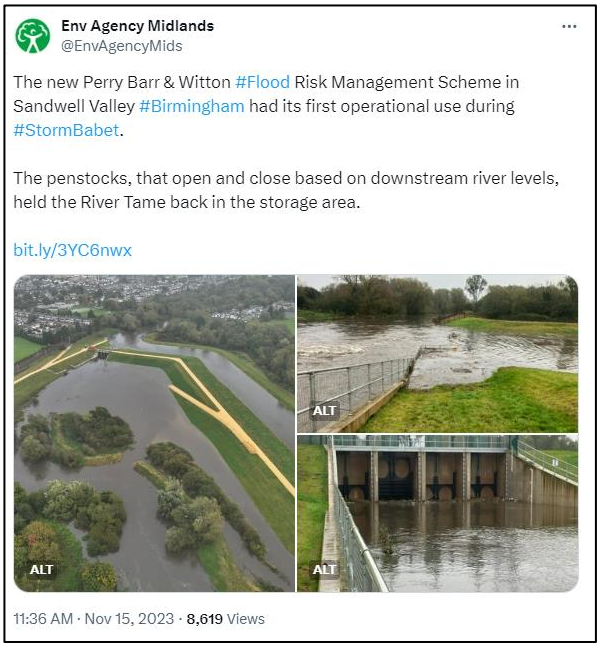
Storm Babet

Across 18th – 21st October, Storm Babet caused major disruption across the Midlands. Extensive highway flooding was seen in Hall Green, Billesley, Northfield and Rednal, whilst railway lines were

submerged between Birmingham and Hereford. Automated Flood Warnings were issued by the Environment Agency for The Bourn at Bournville, River Rea at Stirchley, Bourn Brook at Selly Oak, River Rea at Edgbaston, River Cole (Sarehole, Sparkhill, Greet, Hay Mill) and River Tame at Hamstead. The Turves Green Brook, Merritts Brook, River Cole all strayed out of bank onto floodplain and fast flowing floodwater posed danger to life. Cars were swept away and over 300 Flood Warnings were issued across England. Forge Mill flood storage area (Perry Barr and Witton) operated for the first time since opening in May 2023[3]. Over 1000 homes across Yorkshire, the Midlands and the Humber flooded, and it was reported that seven people lost their lives.



Screenshot from **Hazard Manager** – taken 20th Oct 2023, available to Category 1 and Category 2 responders / organisations (as defined in the Civil Contingencies Act 2004)



November continued to be unsettled and wet, with Storms Debi and Ciaran bringing 50mm – 100mm of rain. Groundwater levels continued to rise, provoking groundwater flood alerts in southern areas of England as catchments remained sensitive to rainfall due to saturated ground. Groundwater levels change seasonally due to variations in long term rainfall and / or water abstraction. Groundwater flooding occurs when the water table rises and reaches ground level, with water emerging to the surface.

December had three named storms – Elin, Fergus and Gerrit, all bringing further heavy rain and high winds. Flooding became noticeable in green and open spaces due to high groundwater levels and fully saturated ground. Northern areas of England saw heavy

[3] https://twitter.com/EnvAgencyMids/status/1724753307695235344?t=Acpk6sfOiDgTWvhFbBp9iQ&s=08

snow landslides and flooded motorways. The Met Office noted that "*between 1 October 2023 and 4 January 2024, parts of the East Midlands, north-east England and eastern Scotland received more than 150% of the 1991-2020 long-term average rainfall*".[4] The sheer number of drainage issues, flooded roads and properties at flood risk was becoming ever more difficult to manage due to relentless rainfall.

Storm Henk

As watercourses were already full and the ground saturated, Storm Henk caused significant flooding within the River Trent catchment. Approximately 300 flood warnings were issued, the Nottinghamshire and Nottingham Local Resilience Forum declared a major incident as water levels reached close to the November 2000 event. Large parts of the East Midlands were badly affected with hundreds of properties flooded and swathes of land inundated. In Hall Green, a mother and child were rescued from a car at Green Road ford[5] and the West Midlands Fire Service issued an urgent safety warning to highlight the dangers of floodwater. The first quarter of 2024 has had persistent wet weather causing underfloor, cellar and garden flooding with extensive ponding on roads and highways.

Flood Warnings and Flood Alerts

73 flood warnings / flood alerts affecting the Birmingham area were issued on the Rivers Rea, Cole, Middle / Upper Tame and Bourn Brook during 2023 (not including Storm Henk on 2nd January 2024). This is in stark contrast to **30** alerts / warnings the previous year. Flood alerts are issued at least 2 hours in in advance, triggered by forecasts that indicate that flooding from rivers (fluvial) may be possible, and do not usually cover surface water (pluvial) risks and/or flooding of smaller watercourses, unless contained within the wider warning or alert area. Flood warnings are issued when flooding is expected to properties or premises.

DATE	WARNING / ALERT AREA NAME	TYPE
13/03/2023	River Rea	Flood Alert
13/03/2023	The Bourn at Bournville	Flood Warning
13/03/2023	River Cole	Flood Alert
29/04/2023	Upper Tame	Flood Alert
29/04/2023	The Bourn at Bournville	Flood Warning
29/04/2023	River Rea	Flood Alert
10/06/2023	Upper Tame at Sandwell Valley	Flood Alert
10/06/2023	River Cole	Flood Alert
10/06/2023	River Rea	Flood Alert
10/06/2023	Upper Tame	Flood Alert
11/06/2023	The Bourn at Bournville	Flood Warning
18/06/2023	Upper Tame at Sandwell Valley	Flood Alert
18/06/2023	River Cole	Flood Alert
18/06/2023	River Rea	Flood Alert
18/06/2023	Upper Tame	Flood Alert
22/06/2023	Upper Tame at Sandwell Valley	Flood Alert
22/06/2023	River Cole	Flood Alert
22/06/2023	River Rea	Flood Alert

[4] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2024/2024_01_storm_henk_v1.pdf
[5] https://www.birminghammail.co.uk/news/midlands-news/hero-who-saved-mum-child-28381333

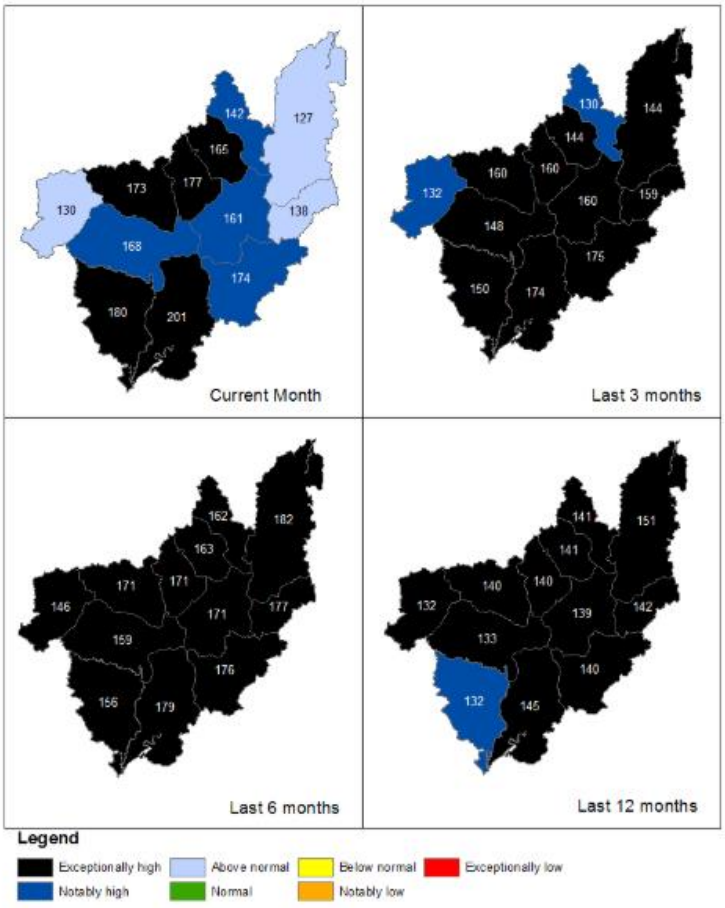
22/06/2023	Upper Tame	Flood Alert
08/07/2023	Upper Tame at Sandwell Valley	Flood Alert
08/07/2023	River Cole	Flood Alert
08/07/2023	River Rea	Flood Alert
08/07/2023	Upper Tame	Flood Alert
08/07/2023	The Bourn at Bournville	Flood Warning
08/07/2023	Bourn Brook at Selly Oak	Flood Warning
08/07/2023	River Rea at Stirchley	Flood Warning
08/07/2023	River Rea at Edgbaston	Flood Warning
17/08/2023	Upper Tame at Sandwell Valley	Flood Alert
17/08/2023	River Cole	Flood Alert
17/08/2023	River Rea	Flood Alert
17/08/2023	Upper Tame	Flood Alert
19/08/2023	River Cole at Sarehole, Hall Green	Flood Warning
19/08/2023	River Cole at Stechford	Flood Warning
19/08/2023	River Cole	Flood Alert
19/08/2023	River Cole at Sparkhill	Flood Warning
19/08/2023	River Cole - Bordesley Green East	Flood Warning
19/08/2023	River Cole at Greet	Flood Warning
19/08/2023	River Cole at Hay Mills	Flood Warning
13/10/2023	River Rea	Flood Alert
13/10/2023	Upper Tame at Sandwell Valley	Flood Alert
13/10/2023	Upper Tame	Flood Alert
13/10/2023	River Cole	Flood Alert
18/10/2023	River Rea	Flood Alert
18/10/2023	The Bourn at Bournville	Flood Warning
19/10/2023	Upper Tame at Sandwell Valley	Flood Alert
19/10/2023	River Cole	Flood Alert
19/10/2023	Upper Tame	Flood Alert
20/10/2023	The Bourn at Bournville	Flood Warning
20/10/2023	River Rea at Stirchley	Flood Warning
20/10/2023	Bourn Brook at Selly Oak	Flood Warning
20/10/2023	River Rea at Edgbaston	Flood Warning
20/10/2023	River Cole at Sarehole, Hall Green	Flood Warning
20/10/2023	River Cole at Sparkhill	Flood Warning
20/10/2023	River Cole at Greet	Flood Warning
20/10/2023	River Cole at Hay Mills	Flood Warning
20/10/2023	River Tame at Hamstead	Flood Warning
28/10/2023	River Rea	Flood Alert
28/10/2023	The Bourn at Bournville	Flood Warning
29/10/2023	River Cole	Flood Alert
03/12/2023	River Cole	Flood Alert
03/12/2023	River Rea	Flood Alert
03/12/2023	Upper Tame	Flood Alert
10/12/2023	River Rea	Flood Alert
10/12/2023	The Bourn at Bournville	Flood Warning

10/12/2023	River Cole	Flood Alert
27/12/2023	River Cole	Flood Alert
28/12/2023	River Cole	Flood Alert
30/12/2023	Upper Tame	Flood Alert
31/12/2023	River Cole	Flood Alert

The Upper Tame flood alert area covers 'low-lying land and roads between Horseley Heath and Castle Vale on the River Tame and Bescot on the Ford Brook'. Middle Tame covers 'low-lying land and roads between Water Orton and Tamworth including the Bourne Brook at Fazeley'. The River Rea alert area affects 'low-lying land and roads between Longbridge and Nechells' whilst the River Cole alert area is for 'low-lying land and roads between Majors Green and Coleshill' on the River Cole.

The Flood Risk Management Team would encourage people and residents at risk of flooding from rivers to sign up for free Environment Agency's Flood Warnings and Flood Alert via the 'Floodline' service on telephone: 0345 988 1188; Textphone: 0345 602 6340 or online.

Summary



Throughout 2023, the Council received hundreds of notifications of garden and highway flooding. with highway flooding usually dissipating once water levels lowered in the sewer system. Council teams have worked closely to try and manage the impacts of flooding, with the risk to people and properties mitigated as far as reasonably practicable.

This map from the Midlands water Situation Report 2024 shows the total rainfall for hydrological areas for the current month (up to 31 March 2024. Birmingham and the majority of the Black Country is shown at the bottom left of the map. In the past 12 months, rainfall in Birmingham has been 'notably high' at 132%.

Source: Environment Agency. Crown Copyright, 100024198, 2024). Rainfall data prior to 2023, extracted from Met Office HadUK 1km gridded rainfall dataset derived from registered rain gauges (Source: Met Office. Crown copyright, 2024).

By the end of March 2024, the soils are at 'field capacity' which means there is no soil moisture deficit (SMD) remaining - in simpler terms, land now sheds water as opposed to storing water. The majority of the Reservoirs are above normal storage levels and are, or are near, full capacity. Water levels at Trittiford Reservoir has been particularly difficult to manage over the past 6 - 8months.

Rainfall intensity is expected to increase in the future. It's envisaged that surface water flooding will become more frequent with intense rainfall totals falling more often. River flows are also expected to increase leading to an increased risk of fluvial flooding. Over the past six months, there has been exceptionally high rainfall totals ranging from 146% to 182% of the long-term average totals (LTA).[6]

3. Flood Event Investigations

In 2016, 2018 and 2023, a significant number of flooding incidents were reported to Birmingham City Council. During these events, Birmingham City Council distributed over 2,000 Flood Questionnaires / Surveys to all residents within, or near, areas where flooding was reported.

Flood surveys are important as they provide accounts of depth / duration of flooding along with any other pertinent information. These responses can accurately report internal property flooding, flood flow routes, note flooding to gardens and inundation on highways and surrounding areas.

In 2023, as agreed at the Birmingham Water Group - the 8th July thunderstorm and surface water flood event triggered a formal Section 19 investigation. A Stage 1 investigation is being undertaken for each reported incident to ascertain the source, path and receptors affected by the flooding, with a Stage 2 investigation where several properties in one location have internally flooded. Site visits are still being undertaken to gather information and inform any future mitigation or viable schemes. When an 'exceptional' storm takes place, it is very difficult to attract grant funding for schemes under current partnership funding arrangements. Adaptation strategies and resilience measures will help address extreme storms and flooding, rather than traditional engineered flood defences.

Groundwater

Birmingham is located over a principal aquifer. The Birmingham Strategic Flood Risk Assessment indicates that it is expected that groundwater levels will continue to rise towards its natural level as industrial abstractions continue to cease; and this is believed to be the cause of groundwater flooding within the council boundaries. Groundwater levels depend on aquifer properties, local geological conditions and a complex balance between recharge from rainfall, and discharges to rivers or pumped abstraction. Groundwater levels can change seasonally and rebound to the surface after a period of prolonged rainfall. Groundwater levels are measured in metres above ordnance datum and levels normally rise and fall with the seasons, reaching a peak in the spring after being replenished through the winter (when evaporation losses are low and soil moist). Levels then tend to decline through the summer and early autumn.

Groundwater levels in Birmingham and London have been rising due to the cessation of pumping from wells, and abstractions not being as frequent as they once were at the start of the 20th century. Persistent rainfall across the Trent Catchment in 2023 and 2024 means that groundwater has become an emotive and worrying concern across areas of Birmingham.

Detailed Investigation and Analysis

The Lead Local Flood Authority conducts detailed investigation and individual location analysis of each area where a property experienced internal flooding. These investigations typically include a review of existing infrastructure and topography, identification of predominant flow paths, site visits and local knowledge gathering. Through a detailed analysis, the Lead Local Flood Authority has identified the types of flooding that occurred at each location during the events of both June 2016 and May 2018.

[6] Data and map taken from Midlands Water Situation March 2024 - https://assets.publishing.service.gov.uk/media/661930ca679e9c8d921dfebc/Midland_Water_Situation_Report_-_March_2024.pdf

The Flooded Sites Action Tracker is being updated following the Birmingham Water Board and ongoing Section 19 investigation, with any feasible cost-effective options to be taken forward into the pipeline of flood alleviation schemes. The team have also been collating flood questionnaires and advising other risk management authorities on mitigation, whilst ensuring high risk structures are kept clear from blockage.

Recommended Actions

Following analysis of affected areas, the Lead Local Flood Authority works in collaboration with other Risk Management Authorities to identify opportunities and options to mitigate flood risk, as potentially a similar rainfall event will result in similar outcomes.

3.1.1 Section 19 Flooding Investigation Report

The Flood and Water Management Act places a duty on Lead Local Flood Authorities to investigate incidents of flooding and this is set out in Section 19 of the act and the investigations are therefore typically termed '*Section 19 Reports*.' The final May 2018 report was published on 30th August 2019 following sign off by the Strategic Flood Risk Management Board as per the previous Section 19 report into the May 2016 flooding. Birmingham City Council and other Risk Management Authorities continue to progress the actions identified in the May 2016 and 2018 Section 19 Reports with updates given at the Strategic Board and Water Group. The 2023 Section 19 investigation is ongoing due to the number of locations affected by flooding.

3.1.2 Flooded Sites Action Tracker

Flood events are tracked in a Flooded Sites Action Tracker. A copy of the most recent tracker is attached in Appendix A. As a result of the May 2018 flooding the number of locations on the tracker has increased substantially. However, plans are in place for the majority of locations, but solutions range from works in the current year, through to proposals for longer term national and regional grant funding.

3.2 Register of Flood Risk Management Assets

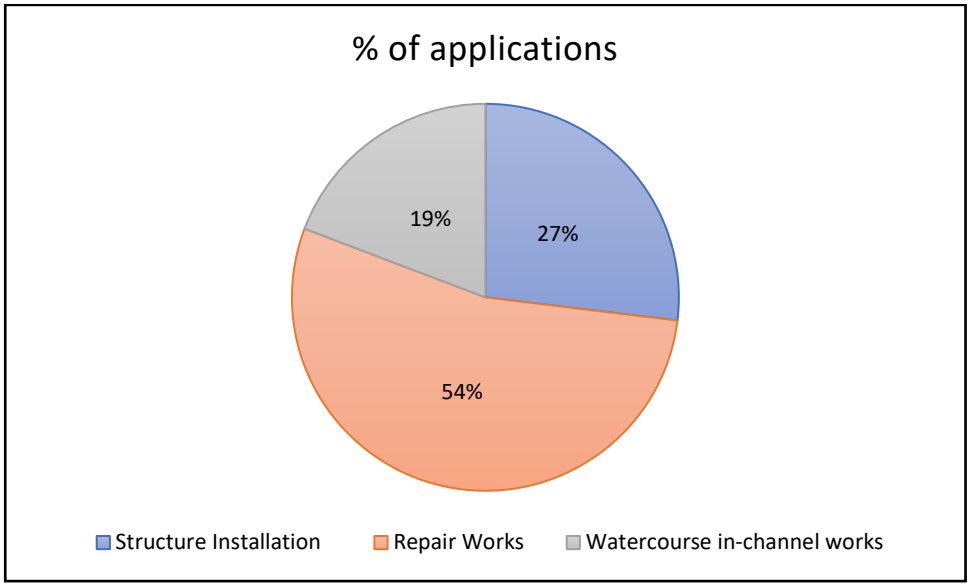
Birmingham City Council continues to maintain a register of structures or features which, in the opinion of the authority, are likely to have a significant effect on a flood risk in its area. This register can be viewed online.

A number of assets have been inspected over the last year in line with the inspection frequency set out in the asset register. Where an issue with an asset has been identified the asset owner has been notified and asked to undertake the necessary maintenance works.

The team has also developed our own Hydraulic Maintenance of Structures (HMOS) database to identify the maintenance priority of structures from potential blockages and the resultant extent of flooding if no cyclical maintenance is undertaken in high-risk areas. This database is to be used as the main driver to develop and promote the FRM Capital Programme of works.

3.3 Consenting Works on Ordinary Watercourses

Birmingham City Council as Lead Local Flood Authority is the Authority responsible for regulating activities on ordinary watercourses in Birmingham. As a result, Birmingham City Council is legally responsible for dealing with applications for ordinary watercourse land drainage consents under section 23 of the Land Drainage Act 1991. In 2023, twenty-six applications were received l for in-channel works or for works within byelaw distance of ordinary watercourses. This is compared to fourteen applications in 2022. The team also advise on internal works and HS2 crossings / exempt activities.



Applicant Type	Number
Developer	3
External	2
HS2	5
Highways PFI	12
Utilities	4
	Total: 26

3.4 Works to Manage Flood Risk

The Lead Local Flood Authority has delivered several capital and revenue schemes. These works are funded from a variety of funding mechanisms and a considerable number of flood risk management works have been delivered internally on behalf of other Birmingham City Council service areas. Most notably the Flood Risk Management Team works routinely with our Leisure services and Parks teams to provide consultancy services for drainage and environmental improvement works. The team also arranges statutory inspections under Section 10 and Section 12 of the Reservoirs Act 1975 to ensure that the Council's eleven large, raised reservoirs are managed in accordance with the Act.

The Environment Agency pipeline is a rolling 6-year programme which can be both updated annually with schemes either brought forward or pushed back, depending on the availability of funding and is fluid. This 6-year programme allows for the development of schemes which will be delivered in future years. The delivery of the Flood Defence Grant in Aid and Local Levy programme for includes flood alleviation and studies to inform schemes to explore preferred cost-effective options. Birmingham-led projects and works including flood mitigation and drainage improvements for other teams and directorates will take place outside of this external programme, as detailed below:

The following works have been progressed in 2023:

3.4.1 Grant Funded: Flood Defence Grant in Aid and/or Local Levy

Community flood resilience measures: (e.g. construction of land drainage to benefit communities and local investigation / measures)

- **Henlow Road –** Work to provide flood alleviation by providing property level resilience measures such as flood doors and air bricks to 5/6 properties.

- **Grendon School Sustainable Drainage** - Construction of SuDs land drainage systems, linear drainage channels and water retaining troughs (SuDs planters) to help alleviate flood risk to the school.

Grant Funded: External Organisations (Partnership working)

- Consultation with the design and development of the **First Avenue Flood Alleviation scheme** with Environment Agency and BCC Landowner (Leisure / Parks Services) for Pebble Mill Playing fields.

- The Wildlife Trust for Birmingham and the Black Country in partnership with the Environment Agency – Consultation and development of costed options, for the Bourne and River Rea to remove major weir structures**.** Proposed works are for naturalisation and to alleviate localised flooding.

3.4.2 Works Funded by Flood Risk Management Revenue Budget

Routine clearance to all strategic grill structures (frequencies vary from weekly to 6-monthly depending on the criticality of the asset) and additional grill clearance following severe weather.

- **Merritts Brook Rear of Trescott Road -** Excavate and re-profile sections of existing channel to improve and restore the cross-sectional area to convey flows to prevent flooding. Major environmental improvements by removing accumulated urban debris consisting of pollutants and overgrown vegetation impeding existing flows to prevent localise flooding. Working in Partnership and collaboratively with Housing Department
- **Tributary to Bourn Brook (Beaumont Road to Arosa Drive**) – Removing major blockages, cutting back overhanging vegetation and environmental works to remove urban debris to restore channel capacity to alleviate flooding. Flood asset inspection and survey of strategic culvert structure to catchment.
- **Tributary to Witton Reservoir (College Road to Crayford Road 0.9 miles)** – Inspection and removing major blockages to major Flood assets consisting of culverted sections and open channelised sections. Removing urban debris and overgrown vegetation impeding existing flows to alleviate flooding and result in environmental improvements. Surveys to identify any major silt accumulation in flood assets which would reduce the flood capacity of structures.
- **Tyburn Road (Birches Green Allotments open watercourse)** – Channel clearance work to channel and flood asset. Works included removing urban debris, silt bunds, overgrown vegetation impeding flows to restore channel capacity and to alleviate flooding properties and the Highway infrastructure.

3.4.3 City Wide

- Sandbag distribution and re-stocking of Hydro-snakes to **Flood Action Groups**.
- Replenished **Hydro-snakes** to Selly Park North and Frankley Flood Action Groups.
- Acquired free **sandbags** from surplus stock (West Midlands Counter Terrorism Section). Arranged for 270 sandbags to be deployed, using framework contractor to Sparkhill area at agreed locations.
- **Flood Asset Maintenance** works to all strategic grills and structures. Including additional and extra maintenance works required to be carried out to grill structures due to Climate changes with increased heavy rain patterns to prevent flooding.
- **Inspecting strategic culvert structures -** As part of general grill clearances and brook-course clearance works.

3.4.4 Inspection & maintenance work to flood defence assets

- Flood defence assets are **inspected** and recorded together with third party assets.
- **Maintaining safe and clearing all access routes to flood defence assets** ensuring there are no restrictions when maintenance work is carried out, especially during emergencies and increased maintenance work due to climate changes.

3.4.5 Other flood alleviation projects

- **Sunningdale Close, Handsworth Wood** – Completed the construction of large earth off-line flood storage balancing pond with new outfall and overflow structures. Re-profiling existing watercourse to provide and ensure a free outfall to existing the major storm water system is established to alleviate flooding.

3.4.6 Works provided for other BCC Departments

On behalf of the **Local Planning Authority**:

- **Sustainable Drainage** - The Flood Risk Management team have supplied pre-application advice on drainage considerations and flood risk.
- The team have also been providing advice for the updated Birmingham **Strategic Flood Risk Assessment** and **Water Cycle Study** to help support the preparation of the new Local Plan for Birmingham City Council.
- The team also advise on the flood risk appropriateness of development sites put forward for development, drainage issues and surface water drainage.
- The team also advise where needed on policy documents, neighbourhood plans, supplementary planning documents, and environmental improvement schemes and proposals.

On behalf of **Housing:**

- **Merritts Brook adjacent to Rhayader Road and to rear of Trescot Road -** works included removing urban debris and cutting back vegetation impeding existing flows to restore channel capacity to prevent localised flooding.
- **Fisher Close balancing pond** – Excavation and Desilting works to existing attenuation storage area to restore flood capacity.

On behalf of **Bereavement:**

- Brandwood End Cemetery – Joint funding to improve the on-site drainage system by replacing defective main outfall surface water pipes, associated manhole chamber and CCTV survey and jetting existing drainage system to deal with overland flows.
- Consultative advice and support to other City-Wide cemetery sites dealing with flooding issues.

On behalf of **Leisure**:

- **Doncaster Way –** Construction of new land drainage system to tie into existing storm water system and landscaping work to alleviate flooding resulting from overland flows.

- **Kings Heath Park Pool –** Desilting Pool to improve water quality Landscaping to level silt bunds from desilting lake. Bank edge stabilisation works using large boulder stones and repairs to water aeration units to improve water quality. Flood storage capacity of pool increased.
- **Perry Hall Playing Fields** – Replacement of feeder pipe to moat, desilting of moat to improve water quality and footbridge repairs. To alleviate flooding to existing footpaths and service roads.
- **Pype Hayes Pool** – Emergency work to replace the 300mm diameter outlet pipework with new surrounded in concrete. Works carried out to prevent flooding over dam structure and footpath infrastructure.
- **River Cole -** Remove major urban debris blockage on River Cole near Ackers to prevent localised flooding to commercial properties, the wider infrastructure and damage to structures.
- **River Cole -** Remove major urban debris blockage on River Cole near Trittiford reservoir to prevent flooding to reservoir and surrounding area.
- **Small Heath Park Pool -** Localised de-silting/removing Urban debris from pool perimeter to improve water quality. Investigation, operation and clearance work of existing penstock/overflow structure to prevent flooding properties and highway infrastructure resulting from overland flows.
- **Trittiford Mill Race** – Desilting work and blockage removal to improve water quality and water quantity to reservoir. Clearance Works to alleviate flooding to highway infrastructure. Clearance and modifications to existing overflow weir structures to operate to divert flows into adjacent wetlands.
- **Westly Brook Church Road to Airport Boundary (1.0mile)** – Excavate and remove silt bunds and reprofiling channel where flows are being impeded to restore the channel's cross-sectional area and restore its flood capacity. Clear overgrown vegetation, fallen trees and remove Urban debris impeding flows to restore channel flood capacity. Clearance work will also identify condition of existing flood assets in watercourse.
- **Scotland Lane adjacent to Bartley Reservoir -** Site investigation works to identify overland flooding to highway infrastructure and option appraisal**.**
- **City Wide Allotments sites –** Provide support, advice, site investigations and engineering options to deal with flooding resulting from surface water flows and overland flows resulting from various sources.

On behalf of **Landscape Practice Group**:

- Continued support and advice for the completed works at Ward End Reservoir - repairs to the existing Aeration system and monitoring the existing overflow chamber pipe with a newly installed penstock valve.

On behalf of **Highways**:

- **Section 38 agreements / Highway Improvement Schemes** – technical advice for highway Sustainable Urban Drainage Strategies (SuDS) and adoption.
- Working on **highway surface water problems and flooding issues** to help promote improve maintenance regimes and improvements to the Highway Drainage infrastructure to reduce flooding properties internally.

- Provide detailed commuted calculations for the operation and maintenance of various Suds features (Ponds, Swales, infiltration basins, Attenuation Tanks Detention Tanks, Rain Gardens and drainage structures installed and proposed to be installed for new developments.
- HS2 Schedule 17, Schedule 33.1 and Schedule 4 applications – advising on highway and public realm considerations for HS2 sites.

Reservoir Works provided for BCC Leisure Services

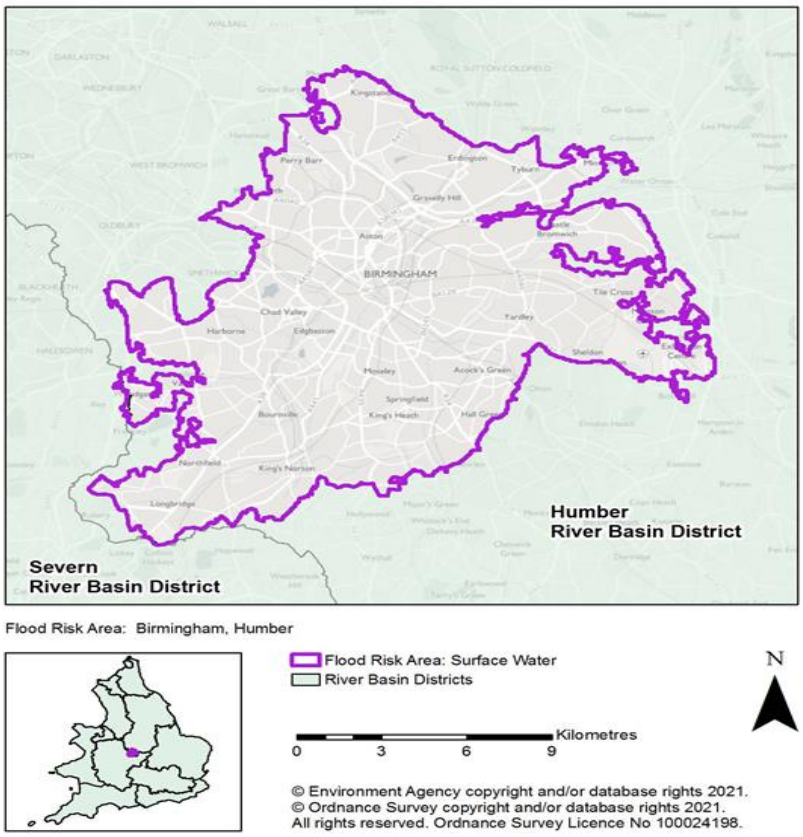
- **Reservoir Act 1975 Section 10 and 12** - Inspections City Wide. **- C**ommission of eleven Section 12 Inspections by Supervising Engineer.
- **Prescribed Form of Record**. – Statutory work under Reservoirs Act to keep records updated and record weekly/ monthly water levels, seepage and penstock operations.
- **On Site Emergency Plan –** Testing of the Statutory On- site Plans with Atkins and Leisure Services colleagues to comply with new legislation for each of the 11 Large Raised Reservoirs.
- **Chamber Inspections at Perry and Swanshurst Reservoirs -** as required under Section 10 of Reservoirs Act on behalf of Leisure Services, 3 monthly.
- **Blackroot Reservoir, Sutton Park –** Work under Section 12 of Reservoirs Act to investigate leak at toe of the dam.
- **Longmoor Reservoir, Sutton Park –** Work under Section 12 of Reservoirs Act to repair of expansion joints on wave wall, repair to gabion baskets and removal of vegetation from survey monitoring locations.
- **Perry Reservoir outlet pipe replacement** – Work under Section 10 of Reservoirs Act in the interest of safety to replace a section of 600mm diameter pipe and replace with new surrounded in concrete.
- **Powells Reservoir** - Work under Section 12 of Reservoirs Act to repair eroded embankment around spillway with Import topsoil and seed, and fence of area, repair mortar joints on wall adjacent to penstock, replace missing cover to survey point, and clear vegetation from wave wall.
- **Salford Reservoir** – Work under Section 12 of Reservoirs Act to removal of saplings growing in dam and other vegetation growing in revetment to reservoir edge.
- **Swanshurst Reservoir Crest upgrade works** – Work under Section 10 of Reservoirs Act in the interest of safety to raise the level of the crest and reinstate to design flood level.
- **Witton Reservoirs** – Work under Section 12 work to remove bushes and saplings growing on dam between lakes and on the lower dam, and vegetation around the outlet stilling basin.
- **Wyndley Reservoir** – Work under Section 10 of Reservoirs Act in the interest of safety to replace existing spillway by liaising with Reservoir inspectors to organise the feasibility and detailed design of a new spillway and associated work.

3.4.7 Flood Risk Regulations Duties

The Flood Risk Regulations implement the EU Floods Directive in England. They provide a framework for managing flood risk over a 6-year cycle, comprising:

- Preliminary Flood Risk Assessment (PFRA)
- identification of areas of potential significant risk, referred to as Flood Risk Areas (FRAs)

- mapping of flood hazards and risk and Flood Risk Management Plans (FRMPs), setting out measures and actions to reduce the risk.



Map showing Birmingham Flood Risk Area (differs from BCC administrative boundary)

Birmingham is noted as a pluvial (surface water) Flood Risk Area and the Environment Agency have designated Sparkhill and Selly Park as Fluvial (River) Flood Risk Area, from the River Cole and River Rea respectively, and they have duly updated the Flood Risk Measures for these areas.

The Birmingham Flood Risk Area (FRA) has been identified as the flood risk from surface water is considered nationally significant. Birmingham City Council, Solihull Metropolitan Borough Council, Dudley Metropolitan Borough Council, Sandwell Metropolitan Borough Council and Walsall Metropolitan Borough Council as Lead Local Flood Authorities take the lead on the development and delivery of the FRMP for this FRA and are responsible for managing flood risk from 'local' sources such as surface water, groundwater and ordinary watercourses.

Surface water flooding in the FRA occurs due to natural and artificial influences. Quite a high percentage of the rain that falls in the upper Tame catchment runs off it as drainage is impeded by the overlying loamy clay soil. Water flows overland entering built up areas. Heavy rain also ponds or flows off impermeable surfaces in the urban areas where it cannot soak into the ground. Urban drainage systems become overwhelmed or unable to discharge into receiving watercourses due to high water levels.

There are sixteen Main Rivers in the Birmingham FRA and numerous ordinary watercourses including unnamed streams and ditches. Many of these rivers and streams are susceptible to flooding. The fast run off from the upper catchments and run-off entering the watercourses from the urban areas means there is a rapid response to heavy rainfall. Historically flooding has been caused by channels not being able to accommodate the high volumes of water and by blocked culverts. Siltation and blockage of key structures can exacerbate flood risk and fly tipping is detrimental. Various communities are at risk of flooding - Selly Park and Sparkhill have been identified as Fluvial (River) Flood Risk Areas where the flood risk from Rivers is considered nationally significant.

Lead Local Flood Authorities worked with the Environment Agency to publish the first set of Flood Risk Management Plans, covering the 10 river basin districts in England, on 17 March 2016. These plans set out how Risk Management Authorities are working together, and with communities, to manage flood and coastal risk over the next 6 years up to December 2027.

We have worked with the Environment Agency and neighbouring Councils to amend, transition and bring forward measures for the 6-year cycle (2021-2027). Birmingham is noted, along with other large, dense conurbations as a **Flood Risk Area**, as there are a significant number of people, infrastructure, and businesses, susceptible to a range of sources of flood risk.

A high-level analysis of the 30-year 'Risk of Surface Water Flooding' dataset (high-risk) shows that there are 39 properties and 3 businesses at risk in Sparkhill Ward. There are **1,785** people (average household size) within the Sparkhill Flood Risk Area, with 358 properties at medium risk, and 386 at risk overall.

There are also 119 non-residential properties, with 66 at risk, as taken from the 'Flood Risk Maps for Rivers and Sea in England - December 2019. The Social Flood Risk Index recognises Birmingham as one of the ten most flood disadvantaged local authorities in UK, and this can provide the most direct measure of flood disadvantage. Birmingham is also in the top ten for the '*Expected Annual Damages (EAD, £m) - Residential only*' metric.

4. Statutory Consultee Role for Planning

The Lead Local Flood Authority (LLFA) is a statutory consultee for surface water on major developments (10 dwellings or more, or equivalent non-residential or mixed development). Local planning decisions should ensure that Sustainable Urban Drainage Strategies (SuDS) for the management of runoff are put in place (unless demonstrated to be inappropriate) and that the sustainable drainage system is designed to ensure that the maintenance and operation requirements are economically proportionate.

The statutory consultee role ensures that proposed developments and surface water drainage schemes are future-proofed in line with the National Planning Policy Framework (NPPF), include appropriate climate change allowances and conforms to the Council's Planning Policies, Birmingham Development Plan, Supplementary Planning Documents (SPDs) and other planning considerations.

We have worked with planning colleagues to improve ways of working for a framework for improved responses and to help inform planning applications more efficiently and effectively. We have discussed validation requirements, and the provision of standing advice for low-risk applications to lessen the burden on the statutory planning role within the Flood Risk Management team and to provide timely advice back to the planning teams.

In turn, we are assisting the enforcement officers with high-profile cases to advise on drainage issues and likely causes of flooding. We endeavour to work alongside with Planning and Planning enforcement to act as an internal consultee / consultant to advise upon unpermitted and any development not in accordance with the approved details, which impact upon flood risk or drainage. The Flood Risk Management team also act as facilitator between the Council and other risk management authorities and Birmingham uses the Flood Risk Management team's experience to better inform and warn those at flood risk. The team have continued to inform and respond to planning proposals, discharge of conditions and reserved matters applications.

By informing Birmingham City Council Policy, it is through strategic planning policies where we can inform major development most effectively. Having an over-riding drainage and flood risk policy such as TP6 helps to detail surface water rates / volumes and the required mitigation to ensure a high quality and sustainable development as well as helping the city adapt to extreme weather

events through the incorporation of new green and blue infrastructure in all new developments. The LLFA continues to influence planning applications and secure developer contributions whilst responding to changes to the planning system, ensuring that proposals are in line and proportionate to new guidance and amendments to the GDPO and 'use' classifications. We have also given detailed pre-application advice to Highways teams and the Birmingham Housing Development Team. This helps ensure that sites that are sensitive to flooding are appropriately designed to reduce and mitigate flood risks, and the sites deliver the optimum number of new homes, and that key transport routes are flood resilient reducing the frequency of road closures.

In the last year, we have provided detailed information in relation to the Birmingham Development Plan Review, highlighting the importance of connecting rivers and creating a network of green and blue corridors throughout the city whilst making space for water and wildlife and supporting active transport routes. We have also focused on the need to support green and blue infrastructure within new developments to mitigate against the impacts of climate change and prepare the city for more extreme weather patterns. We have provided evidence to the emerging Birmingham Local Plan and policy recommendations that will actively reduce flood risk to new and existing developments, whilst supporting wider biodiversity and health goals.

Throughout 2023, the team has been a key consultee in the developing a delivery plan for Rea Valley SPD, which is the largest city brownfield regeneration scheme in England. We have also advised on flood risk, drainage and the creation of community scale green and blue infrastructure and climate change adaptation, provided examples of best practice and identified funding partners and opportunities to regenerate this key area of the city to provides homes, offices and commercial development in this area.

The LLFA have influenced the now adapted Perry Barr Masterplan which promotes flood resilience, SuDS and green and blue infrastructure to manage surface water within new areas of public realm and public spaces, and new developments. Specifically, the document introduces strategies for sustainable spaces and buildings, including sustainable water management and urban drainage, green walls and roofs, and green and blue infrastructure as an element of cultural and arts space such as the creation of SuDS amphitheatre for music and live performances in addition to opportunities for play for children, and habitat creation through the enhancement of Perry Park.

We have been working to support the submission of a planning application for the former Wholesale Markets / Smithfield Development site, prioritising flood risk management from all sources and the incorporation of green and blue infrastructure within streets and public realm. In the adjacent Rea Valley Urban Quarter, we have worked with the applicants of the Warner Fields Scheme to develop a network of green and blue infrastructure and naturalised river corridor. The scheme now proposes the creation of attractive green and blue infrastructure, a large SuDS amphitheatre set around the historical Birmingham Manor and moat which can be traced back to the Doomsday Book and the De Birmingham Family, with open water features and rainwater gardens and SuDS tree pits.

Work has also continued to support the Warners field planning application which includes the restoration and enhancement of the River Rea, where we have been instrumental in agreeing the phased delivery of sites within the scheme to ensure that sufficient capital is available to deliver the environmental and flood risk benefits to the city which extend further than the development itself. The scheme includes green roofs, rainwater gardens and includes a S106 agreement to deliver the first phase of a rainwater boulevard linking the Smithfield Development to Warners field to Highgate Park managing the surface water flooding in this area.

The LLFA has worked closely in the high-profile schemes for the relocation of the BBC and other heritage sites in Digbeth. Through continued engagement, we have helped secure the creation of new rainwater gardens and surface water management within the existing former industrial sites to enhance the public realm. Once the broadcast centre at 'The Tea Factory' is complete, it will

showcase an area of high-quality green environment that is being created in Birmingham, ensuring that the restored building creates an attractive setting that will be broadcast to the nation highlighting both the beauty of our historic past and how we are adapting our city for the future. We also influenced the planning application to enhance the Banana warehouse and public realm around to prevent surface water flooding, with the area now used as a filming location for Channel 4.

We have worked to influence planning applications across the East of Birmingham including the new Garrison Circus development which will transform an underutilised brownfield site to unlock a new gateway into Digbeth, whilst also supporting the wider regeneration of the area. Not only will we deliver much-needed new homes and support the vibrancy of nearby universities but creates street-level community uses and green space for existing residents in the area to enjoy. It retains the historic Myona building whilst integrating sustainable water management.

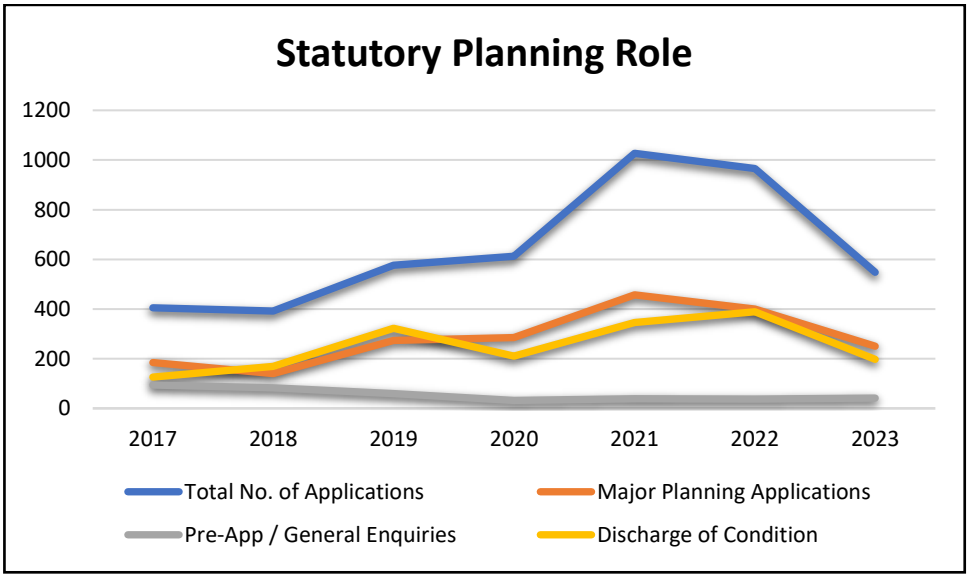
We continue to work closely with landowners and developers to deliver much-needed homes, industrial / commercial development and community infrastructure on the former MG-Rover site in Longbridge. The work to expand and enhance the river corridors and a network of swales, ponds, and green infrastructure to reduce surface water discharges, whilst expanding biodiversity and protecting water quality in the River Rea Catchment to help reduce flood risk. Part of our role is to help represent Birmingham City Council in the international network of biophilic cities group supporting best practice environmental projects.

We also have a key role advising on HS2 to advocate the naturalisation of watercourses, incorporate SuDS wherever possible and limit discharge rate as far as practicable from linked developments. We had a key role in offering advice for the 'greening' of Curzon Street Station and the water management of this flagship site to incorporate sustainable drainage and climate resilient green infrastructure within its design. We've advised on the partial restoration of the Washwood Heath Brook to create connectivity to Ward End Park, HS2 Depot and new industrial development with the proposed creation of new balancing ponds and green infrastructure to enhance the local environment whilst ensuring that public safety is incorporated within the design.

We have continued to influence the development of Langley and Peddimore Urban extensions, ensuring that the river corridors are expanded, enhanced and water quality is protected. With agreements in principle for the new green and blue infrastructure in Langley, we are creating a sustainable and climate resilient development of which over 30% of the site will be set aside for green and blue infrastructure, nature recovery and biodiversity enhancement. The number of applications, discharge of conditions and pre-application enquiries from 2017 to 2023 is detailed below:

	Total No. of Applications	Major Planning Applications	Pre-App / General Enquiries	Discharge of Condition
2017	405	185	94	126
2018	392	140	83	169
2019	577	274	59	322
2020	613	285	32	210
2021	1027	457	39	346
2022	965	400	37	389
2023	548	250	41	197

Note: Due to re-consultations with revised details, actual numbers are often more than total application numbers



Graph showing planning applications numbers from 2017 - 2023.

The LLFA have a level of consultant support to help deliver provide timely responses to applications, developer and planning enquiries sent through for comment for 2023, however this arrangement may not continue throughout 2024/2025 and therefore, subject to funding, the level of service may need to be reduced.

5. Funding

5.1 Funding Streams

Funding for Lead Local Flood Authority

Funding for Lead Local Flood Authorities to meet the duties under the Flood Water Management Act is provided to Birmingham City Council as part of the Local Government settlement. This funding is not ring-fenced and the budget for the Flood Risk Management Team was dependant on financial pressures and other key services within the Council.

Environment Agency Partnership Funding Calculator

On 17 April 2022, Defra and the Environment Agency published revised guidance on partnership funding for flood and coastal erosion risk management. The changes are part of a suite of initiatives to help deliver the ambitions of the 25 Year Environment Plan and the new FCERM strategy. The Partnership Funding rule changes include:

- Updating payment rates to reflect inflation and new evidence on flood damages since 2011 (including people impacts such as mental health);
- Amending the flood risk bands for qualifying schemes to add a new intermediate risk band between high and medium risk. This will mean more schemes that reduce surface water flood risk are likely to receive government funding in the future;
- Accounting for the future impacts of climate change by also including people and properties that would potentially become at risk over the lifetime of a project;
- Improving the payment rates for environmental benefits to capture more fully the wider environmental benefits delivered by flood and coastal erosion risk management projects and to help support nature-based solutions.

Revenue Budget

A small budget is provided to support flood management responsibilities, these include land drainage, maintenance of ordinary watercourses and emergency response. This budget has reduced over recent years in line with City Council budget cuts. A risk-based approach is undertaken to ensure that high risk grills are cleared before and after heavy rainfall as the strategic grills have a real impact on flood risk if left occluded. Further detail is given below for the envisaged 2024/2025 position.

Flood Defence Grant in Aid - Partnership Funding

In the past, flood risk management schemes were generally funded by central government through the Flood Defence Grant in Aid (FDGIA) process which allocated funding to projects nationally based on cost/benefit prioritisation. This led to only schemes that scored highly in terms of benefits outweighing costs being taken forward.

From 2012, a revised approach has been undertaken. Funding levels for each scheme, paid by central government as Flood Defence Grant in Aid, relate directly to the benefits the scheme delivers, including number of households protected, damages prevented, deprivation, environmental benefits and amenity improvement. If the FDGIA does not cover the cost of the scheme, the cost / scope can either be reduced and/or local contributions would need to be found. In 2020, the Environment Agency published a new Partnership Calculator, with revised grant rates for surface water schemes.

Local Levy

The City Council pays levies to the Environment Agency in the form of Local Levy, in 2023/24 the Local Levy contribution was £312,103. The Local Levy is raised by the Regional Flood and Coastal Committee (Birmingham sits within the Trent Committee area) and is used as a locally raised source of income to fund projects within the Trent Regional Flood and Coastal Committee region (RFCC). Local Levy can be used to fund projects that might not be eligible for national funding or as a regional contribution to scheme costs under the partnership funding approach.

On a majority vote, the RFCC ratified a 2% increase to local levy payments in 2024/25 bringing Birmingham's contribution to £318,345. A 2% increase would provide a 37 to 1 cost benefit ratio; however, a 2% increase would be a reduction in real terms with the cost of inflation. Birmingham City Council are a significant net contributor to the pot but has an equal chance of securing the funding relative to net beneficiaries for Councils within the Trent RFCC.

The amount raised from each Local Authority is based on the number of Council tax band D properties which has been agreed as a fair and equitable basis for the calculation.

The Partnership Funding process has resulted in a range of funding sources being required to promote and deliver flood risk management schemes. For some schemes this includes an element of Flood Defence Grant in Aid together with an element of Local Levy but for many schemes this still leaves a shortfall which needs to be provided as third-party contributions. This approach puts significant pressure on limited resources to foster agreements and collaborations to facilitate schemes. For these schemes to progress, local contributions or contributions from beneficiaries of the schemes need to be sought.

Birmingham has an elected member on the Regional Flood and Coastal Committee with voting rights and since February 2021, Birmingham City Council has a representative voting position on the Trent Regional Flood and Coastal Committee Financial sub-committee. As the largest Council in the Trent RFCC area and as the largest Unitary Council nationally, this is an important step to understanding the nuances of Local Levy bid appraisal and the approval criteria of the sub-committee. It means the Council has a say where Local Levy should be used across the Trent RFCC area.

5.2 Funding Pressures

In September 2023, Birmingham City Council issued two Section 114 notices as part of the plans to meet the council's financial liabilities relating to equal pay claims and an in-year financial gap within its budget. The Council needs to identify over £250 million worth of savings over the next 12 months and there will be considerable changes as a result for residents.

In terms of flood risk management, the Council appreciates there will be a proposed change in approach. We will adopt a more focused, risk-oriented strategy for inspections and maintenance to make sure high risk drainage assets are kept as clear as possible to help reduce flood risk.

The Council and Flood Risk Team remain committed to prioritising our work where it is needed most. An Equality Impact Assessment has been undertaken to help assess the impacts of a reduction in programmed flood risk management and maintenance activity of £50k savings per annum – this document can be found here. A revised Local Flood Risk Management Strategy will reflect the proposed changes and will be available for public consultation.

It will however be more difficult to fulfil the duties under the Flood and Water Management Act, carry out the statutory consultee role for planning and undertake maintenance of flood risk management assets and provide emergency response. Non-statutory services need to be re-assessed, such as the provision of sandbags to formal flood action groups on request.

Aligning funding sources and facilitating the promotion of projects as well as seeking new funding opportunities continues to be a major priority for the Strategic Flood Risk Management Board and Flood Risk Management team for 2024/25 and beyond into later years.

The Flood Risk Management team are a highly technical team and can cope with most demands in terms of projects, schemes and community engagement. However, the Lead Local Flood Authority struggle to provide timely responses to the sheer number of Developer and Planning enquiries expected of the team.

Whilst we endeavour to be pre-emptive, there will always be an element of having to react to conditions and weather events as they develop. Although we can prepare for the challenge of climate change and financial change - as a Council, we will also need to develop an improved understanding of our reliance upon historic and aging infrastructure and work closely with partners, Members and communities, to upgrade systems where necessary and find funding streams to enable us to become more resilient for the future.

6. Scrutiny: Previous Actions for Improvement

After the flooding on 27th May 2018, a motion was passed at the Birmingham City Council meeting on 12th June 2018 calling for an inquiry into the floods of May 2018, to be carried out promptly. The motion called for the inquiry to include strong resident input and for the report to be debated as a main agenda item at a future City Council meeting. The review was conducted by members of the Sustainability & Transport O&S Committee on 19th July 2018. Several areas for improvement were noted in the subsequent investigation report. Progress against each area for improvement is outlined below.

6.1 Emergency Response Procedures

Area for Improvement: ***This flood was significant and although not classified as a Major Incident and no triggers to activate the Emergency Arrangements were met, the impact was significant for all those concerned. The lack of notification and alerting by strategic partners resulted in the City Council not being able to establish the level of coordinated support it***

would wish. As part of a wider review, the City Council is enhancing its response and emergency arrangements, lowering the triggers to alert the Resilience team and ensuring their involvement. It is also working with strategic partners to ensure that more robust notification of incidents occurs. These changes are needed to provide residents and businesses with a more coordinated support package both during and after such flood events which meet the changing needs of residents during the recovery cycle.

Update: The Council's Emergency Plan has been reviewed and an interim update was published in March 2019. All core council roles within the plan have been identified and training provided, and activation of the duty officer (Council) remains key to activating any of our arrangements. The proactivity of the duty officer has been increased and we are actively promoting the notification of Birmingham City Council from partners (and following up any missed notifications) by partners. In heavy storms and thunderstorms, the flood risk team monitored rainfall, undertook site visits and checked river levels and informed and liaised with Flood Action Groups at risk.

6.2 Model Constitution or Model Template for Flood Action Groups

Area for Improvement: ***During the evidence gathering there was an offer of support from the National Flood Forum to liaise with the City Council and to provide advice, mentoring and support to residents wishing to set up a FLAG. It is hoped that Birmingham City Council will respond positively to this offer and that a model constitution or model template for FLAGS can be produced which can be made available as a resource to support local people to set up and run FLAGS in their area. However, as with any potential provision of support from the NFF to supplement the Birmingham City Council functions (either through establishing FLAGS or supporting citizens in recovery following an incident), funding will need to be identified and a clear understanding of what will be delivered for that funding will have to be agreed with the NFF and potentially other partner organisations.***

Update: The Birmingham City Council Flood Risk Management and Resilience teams have been supporting FLAGs as much as possible, alongside our other duties. Since the floods in May 2018. Birmingham City Council, the Environment Agency and Severn Trent Water have attended FLAG meetings in Selly Park North and Sparkhill. Groundwork West Midlands were commissioned by the Environment Agency to support the FLAG in in Sparkhill by increasing personal resilience and to provide training to Flood Action Group members. Groundwork continued this project with community events in 2022 and ended their Flood Action Group involvement in 2023 as funding arrangements ceased.

6.3 Traffic Management during flood events

Area for Improvement: ***The issue of Traffic Management during flood events needs to be followed up with both West Midlands Police and National Express West Midlands and other bus operators to make sure that a mechanism is put in place to ensure that traffic is re-routed and diverted away from flooded areas during a major incident.***

Update: Whilst it remains an operational consideration of all transport providers as to their routing, when activated, there are links and mechanisms in place to engage transport providers by Birmingham City Council as part of all our arrangements, the duty officer is able to contact transport providers and will endeavour to in a prioritised way (e.g., after dealing with risk to life and similar resident issues). This issue became apparent again in 2023, where major motorways, railways and routes were inundated with surface water. It is difficult to manage traffic flows when areas are subject to flash flooding, however good communications help to warn and inform people of any diversions and of safer routes to take.

6.4 River Cole Valley Partnership

Area for Improvement: ***A River Cole Valley Partnership arrangement should be pursued by the Environment Agency along the lines of the arrangements already in existence for the rivers Rea and Tame, to facilitate the provision of flood defence and flood alleviation measures along the River Cole Valley.***

Update: The Environment Agency and Birmingham City Council have been working together since the floods of 2007 to develop flood alleviation measures along the River Cole valley. Over this time several partnerships have been developed including a joint study with Severn Trent Water and Solihull Metropolitan Borough Council. Several options have been examined all of which failed to meet the central government cost benefit ratio for flood defence schemes.

The Environment Agency and Birmingham City Council have had further discussions since the 2018 flooding about developing a flood risk management scheme to offer protection to properties along the River Cole corridor including reviewing the risk status of the river and potential enmainment to identify funding opportunities.

The Environment Agency has suggested that a catchment wide approach to managing flood risk needs to be taken to develop a programme within the 2021 – 2026 programme. It has been agreed to invite Solihull and Worcestershire, as neighbouring Lead Local Flood Authorities to form a catchment Partnership with Birmingham City Council and the Environment Agency to undertake optioneering exercises to identify potential options for reducing flood risk.

The Environment Agency continue to explore a catchment-based approach, identify suitable alleviation measures and funding opportunities to enable a suite of options to present to wider stakeholders and adjoining Councils in the upper reaches of the River Cole catchment. A flood risk alleviation scheme is imperative, given the known risk to communities along the Cole valley.

Birmingham City Council Flood Risk Management Team were successful with a Local Levy bid to the Environment Agency for initial site investigations to cost up Property Flood Resilience measures for high-risk areas in Sparkhill, on the proviso that the installation of property flood resilience measures would not compromise the delivery of any wider alleviation scheme. The work continues with a view to inform a business case to attract further funding.

7. Improvements

7.1 Flood Risk Management Team Pro-active Measures

The Team works with the Cabinet Member who holds the Highways and Flooding Portfolio and continues to work closely with elected members and other teams to address flooding concerns and issues in their respective areas. We remain supportive, and endeavour to attract funding to help allay flooding and drainage and work with other teams to improve existing and inform proposed sites through Consenting and Planning. As mentioned, Birmingham is represented on the Trent Regional Flood and Coastal Committee (RFCC) and have a regular representative on the Trent Financial Sub-Committee (FSC) to ensure that we maximise and realise funding opportunities as the one of the largest financial contributors of Local Levy in the Trent Regional Flood and Coastal Committee. It is important that our views are heard and that we work closely with other risk management authorities in partnership. The team also have a representative on the Chartered Institution of Water and Environmental Management (CIWEM) West Midlands Committee.

Developing HMOS (Hydraulic maintenance of Structures) to help inform prioritisation for a capital programme of important flood risk assets, mainly related to bridge and culvert structures. We have also been working with Highways Asset teams and Kier to identify areas which would benefit from highway drainage improvements.

7.2 Flood Risk Management Audit

In early 2020, the Flood Risk Management team were audited for all aspects across the service area including, but not limited to:

- Co-ordination and monitoring arrangements established for flood management within the Directorate and across the Council as appropriate;
- Partnership working arrangements established with all relevant Risk Management Authorities and relevant external organisations;
- Arrangements for ensuring a Local Flood Risk Management Strategy for Birmingham has been established and is being kept up to date;
- Systems established to identify and prioritise any maintenance or improvement works required on the Council's watercourses.
- Mechanisms in place to ensure planning applications / any new development schemes are considering and identifying all appropriate measures to address potential flooding risks;
- Drainage Section's processes for identifying and obtaining appropriate sources of external funding to help support the Council in achieving its responsibilities as a Lead Local Flood Authority and a Land Drainage Authority.

No major concerns or issued were found by virtue of the audit and the team received recommendations on how to further improve the service.

7.3 Consultants

Although the team are currently fulfilling all statutory roles - the demands on our service are such that we require additional consultant support for the statutory planning role due to the breadth and depth of our work with other parts of the Council.

The team are experienced in writing business cases, developing local engineering measures / options and liaising with communities and landowners. The team will continue to upskill where required and attract funds to enable the team to develop schemes whilst drawing on Consultant support for hydraulic modelling and other time / resource-intensive projects.

7.4 Future Look

7.4.1 SuDS Approval Body

Schedule 3 to the Flood and Water Management Act 2010 placed a duty on Lead Local Flood Authorities to also become a SuDS Approval Body (SAB), however the legislation has not yet brought into force in England. The legislation is to give SAB's statutory responsibility for approving and, where appropriate, adopting approved drainage systems. The SAB would evaluate and approve drainage applications for new developments and then adopt / maintain SuDS schemes, subject to conditions and exemptions. DEFRA is to consult to collect views on the impact assessment, national standards and statutory instruments with a current view to implement SABs in England from 2024 onwards.

As schedule 3 has already been implemented in Wales since January 2019, all new developments of more than 1 dwelling or in excess of 100 square meters, now require sustainable drainage, designed and built in accordance with Statutory SuDS Standards. SuDS Schemes are to be approved by the SAB, before construction work begins.

At current, the LLFA looks at major developments (e.g.10 houses or more[7]), however this may change to look all proposals of 1 dwelling or more and minor development proposals. If implemented in England, this will have a huge impact on the level of resource and funding required for the LLFA / SAB. The level of growth and infill development across Birmingham would mean that a sizeable team would be required to comment upon planning applications and adopt / maintain SuDS schemes.

[7] For housing, development where 10 or more homes will be provided, or the site has an area of 0.5 hectares or more. For non-residential development it means additional floorspace of 1,000m^2 or more, or a site of 1 hectare or more, or as otherwise provided in the Town and Country Planning (Development Management Procedure) (England) Order 2015

Appendix A - Flooded Sites Action Tracker*

***As a Section 19 investigation is still ongoing for the July 2023 flood event, this tracker will be updated in due course to reflect suggested mitigation and recommendations for stage 2 sites**