

FLOOD INVESTIGATION REPORT

23 June 2016



HILLINGDON
LONDON

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Executive Summary

The London Borough of Hillingdon as a Lead Local Flood Authority has a duty under the Flood and Water Management Act to investigate the significant internal flooding of properties, following the events of 23rd June 2016.

This report provides a summary of the events on the day and in the appendices lists all the known key sites flooded.

The Council thanks everyone who contributed to this report, which records the issues and provides relevant information to comply with the legal requirements in a more transparent way. This will help the understanding of the flood risks and assist organisations in prioritising flood mitigation works in the future.

The Council recognises that flooding has had a devastating affect on the residents who have been affected, so it has invested time and resources in producing this report in order to investigate all the significant incidents of flooding.

Flooding occurred in 36 different locations that day, mainly in the north of the borough. Of the 88 properties known to have been flooded internally, 63 were residential and 25 commercial. At least 83 more sites, (front gardens, garages and roads) were affected in addition. It has therefore taken time to identify all the relevant organisations having responsibilities in connection with the flooding, the action they have already taken and, where possible, the action they intend to take.

This investigation marks a point in time. There are a number of actions that have been identified, both generic, which apply to the whole borough, and site specific, where flood mitigation proposals will be taken forward.

The Council will continue to invest time in developing ways to reduce flood risk for our residents.

1. Investigation

1.1. Why is an investigation required?

The London Borough of Hillingdon as a unitary authority is designated a Lead Local Flood Authority, (LLFA).

The report is produced to fulfil Lead Local Flood Authority duties to investigate significant flooding under the Flood and Water Management Act 2010. The Council proceeded to do so once significant flooding reports were received following this event in June 2016.

1.2. What must an investigation contain?

The Flood and Water Management Act (FWMA) 2010 Chapter 29 Part 1 Section 19 states:

"On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate –

*Which risk management authorities have relevant flood risk management functions,
and*

Whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to flood.

Where an authority carries out an investigation under subsection 1) it must –

- (a) Publish the results of its investigations; and*
- (b) Notify any relevant risk management authorities".*

Risk Management Authorities are defined in the FWMA Chapter 29, Part 1 Section 5, 13

1. The Environment Agency
2. a lead local flood authority (LLFA)
3. a district council for an area for which there is no unitary authority *
4. an internal drainage board *
5. a water company
6. a highway authority (as defined by Highways Act 1980 Section 1)

* not applicable in the London Borough of Hillingdon

Although the Flood and Water Management Act does not give organisations that are not defined as a risk management authority an obligation to provide information, it is clear that others have a contribution and a role to perform in managing flood risk. These organisations such as Network Rail and London Underground in order to provide residents with an understanding of the issues that affect them must be included in this investigation.

1.2.1. Best practice

The two previous investigations undertaken by Hillingdon have been reviewed and a number of learning points have informed this investigation.

In addition Defra have undertaken a review of the current Investigation reports produced so far by LLFA "Evidence review of factors contributing to surface water flooding from Section 19 LLFA reports" Final Report FD2692 October 2015. This made a number of recommendations that should be contained in future investigations, which included the establishment of the return period for the rainfall event.

1.2.2. Reporting and sharing of information by residents

The Council thanks all residents who have taken the time to be interviewed and contribute photos and information in order to collate this document. Without this information, the Council would not be able to understand the issues and direct resources to those areas that have been affected the most. Photographs and specific details of the time of the event and noting where water started coming from are most helpful in investigating the event.

The council has sought to address concerns of residents that their properties may be blighted by the provision of this data by publishing only the number of properties affected within a road, an approach also taken by the Environment Agency and consistent with the approach of other Lead Local Flood Authorities.

1.2.3. Sharing of data by Risk Management Authorities and other organisations

In addition the Council thanks all partner organisations who have have met with the Council and contributed to the provision of evidence and information on their actions. It is recognised that the investigation process undertaken by Councils as the Lead Local Flood Authority is still a relatively new responsibility to Risk Management Authorities and is continuously evolving.

2. Overview of flood risk in Hillingdon

2.1. Land use and topography in Hillingdon

Hillingdon enjoys a very rich natural heritage, with considerable tracts of open landscape and attractive lakes and waterways, both natural and man-made in the Colne Valley. About a third of the Borough has been designated as Green Belt.

There are historic woodlands, open fields, agricultural land, flooded gravel pits, rivers including the Colne and Crane, and the Grand Union Canal. Further information can be found in the Hillingdon's landscape assessment¹.

2.2. Sources of Flood Risk in Hillingdon

Hillingdon Council is susceptible to a number of different sources of flooding, including rivers, surface water, ordinary watercourses, groundwater, reservoirs and sewers.

Within its boundaries lie the River Colne and River Crane catchments, which incorporate the River Pinn and Yeading Brooks, East and West Arm and significant lengths of ordinary watercourses.

The Council has also identified large areas as being at risk from surface water according to risk of surface water flooding maps published by the Environment Agency. These can be found on **Gov.uk**, on the [long term flood risk information](#) pages, alongside maps showing risk from rivers and reservoirs².

It is identified that flooding from main rivers could potentially affect over 5,532 (Provided by the Environment Agency in 2016) people in the borough and potentially surface water could affect 29,300 residential properties and 1,300 commercial properties (Data taken from the London Borough of Hillingdon Surface Water Management Plan).

In most cases in Hillingdon flooding is a result of complex interactions between sources.

Including this event in June 2016, the last three significant events have occurred as a result of high intensity summer storms which have lasted less than 24hrs and generally only 1 hour.

2.3. Hillingdon's Flood Risk Management Portfolio of documents

There are a number of documents that Hillingdon Council has produced to establish the flood risk to the borough and the strategies that need to be put in place to manage those risks. All these documents can be found on the Council website on the "[Flood Risk management](#)"³ page.

These include Hillingdon's Strategic Flood Risk Assessment and Surface Water Management Plan, which contain more information on the risks.

Two previous investigations have been undertaken by the Council and can be found on the Council website on the Flood Risk Investigation page⁴, Winter 2013 - June 2014 and July 28th 2014.

¹ <https://www.hillingdon.gov.uk/article/9123/Hillingdons-Landscape-Character-Assessment>

² <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

³ <http://www.hillingdon.gov.uk/article/24117/Flood-risk-management>

⁴ <http://www.hillingdon.gov.uk/article/29022/Flood-risk-investigation>

3. Summary of 23rd June 2016 Flood Event

3.1. Weather

3.1.1. Forecasts

The Met Office provides a range of services through Hazard Manager that help authorities prepare for and respond to emergency incidents that are caused or influenced by the weather.

The rainfall forecast by the Met Office and provided through a system called Hazard Manager indicated the rain rate in mm/hr to be from 2mm to 32mm across the Borough. The storm was indicated to pass through the borough quickly from the south west to the north east limiting the likelihood of the possible highest concentrations. However as with all forecasts it was not possible to tell exactly which areas would be most affected.

The Flood Forecasting Centre (FFC) is a partnership between the Environment Agency and the Met Office, combining meteorology and hydrology expertise into a specialised hydrometeorology service. The centre forecasts for all natural forms of flooding - river, surface water, tidal/coastal and groundwater.

3.1.2. Warnings

The forecast is then provided in the form of warnings to partners and the public through a variety of channels including the media.

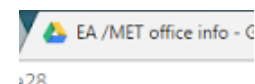
Wednesday 22nd June a **Flood Guidance Statement** issued by the Flood Forecasting Centre. This forecast a medium likelihood of flooding to the East of London, and low likelihood of flooding in the wider South East.

22nd June a **Flood Alert** was issued by the Environment Agency for The River Pinn and Woodridings Stream at 15:57. This was issued pre-emptively based on the weather forecast, not on river levels.

Thursday 23rd June a **Flood Guidance Statement** was issued by the Met Office on the day of the event, stating:

"There is a MEDIUM flood risk for surface water flooding today (Thursday) across parts of the south-east of England including Greater London."

"Torrential, thundery downpours may affect parts of the south-east of England including Greater London this afternoon. This brings a medium likelihood of renewed and continuing significant surface water flooding impacts, giving a MEDIUM overall flood risk here."



23rd June - an **Amber Rain Warning** was put in force by the Met Office for London and South East England at 10.34am, valid from 3pm - 11pm.

23rd June - a further **Flood Alert** was issued at 17.20pm for **The Colne Brook at Iver and Colne Brook** as water levels had risen.

23rd June - a **Flood Warning** was issued by the Environment Agency at 19:03pm, for **The River Pinn at Eastcote Village**. The content of which is shown below:

A Flood Warning has been issued by the Environment Agency for the River Pinn at Eastcote Village.

Flooding is expected for The River Pinn at Eastcote Village tonight.

Immediate action required.

Flooding is expected to affect up to 20 properties in this area.

Following torrential thunderstorms this afternoon, the River Pinn has responded very quickly and property flooding is now possible in the Eastcote Village area.

The storms are likely to pass out of the area later this evening. We continue to monitor this developing situation.

Check your flood response plans to see how your organisation needs to respond.

- Advise the public to call Floodline on 0345 988 1188 using quick dial 172706 for up-to-date flooding information.

- The Environment Agency website contains details of river level and flooding information and can be accessed at www.gov.uk/environment-agency.

- Please report any flooding in your area to your local Environment Agency office.

Contact:

Environment Agency

Hertfordshire and North London Area

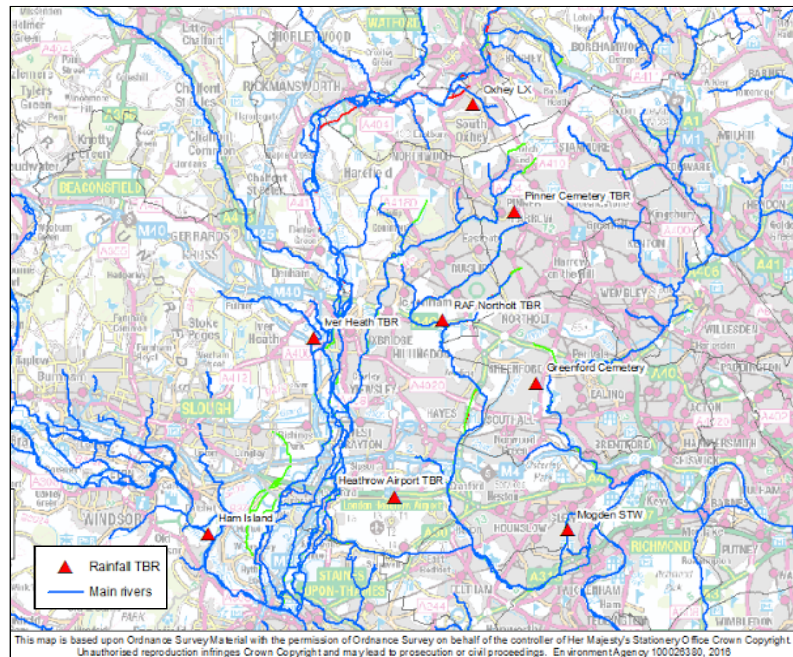
Flood Warning Duty Officer

23rd June - **Flood Warnings** were issued for **The River Pinn at Ruislip** at 19:08, **The River Pinn at Ickenham** at 19:36 and **The River Pinn at Yiewsley** at 21:58.

3.1.3. Rainfall

The following data was requested from a variety of sources by the Council.

There are a number of gauges which record rainfall within and near to the Borough held by the Environment Agency. These are shown on the map. Those closest to the key affected areas were identified as **Iver**, **RAF Northolt** and **Pinner**. Unfortunately the Northwood site identified on the map was a private site which closed in June 2015.



Map 1 Environment Agency Rainfall Gauges

The rainfall information from these gauges was requested after the event for the full 24 hr period to understand the conditions leading up to the event. This was analysed and key information presented in the following tables.

Iver Heath	276036TP
Time period	Rainfall (mm)
0:00 - 7:30 am	20.8
16:45 - 17:45 pm	28.4

RAF Northolt	247344TP
Time period	Rainfall (mm)
0:00 - 07:30 am	26.4
16:45 - 17:45 pm	11.8

Pinner Cemetery	247281TP
Time period	Rainfall (mm)
0:00 -6:45 am	23.2
15:00- 18:00 pm	13.6

Table 1 Environment Agency Rainfall Data

Leading up to the flood on the evening of the 23rd June it can be seen there were considerable volumes of rainfall in the morning, so land was already saturated. Although the totals of the morning rainfall are higher, this rainfall is spread out over a 7 hour period. There were reports of water ponding on roads, but no reported significant impacts in the morning.

The afternoon's rainfall is concentrated into 1 hour. In Iver the highest concentration is at 16:45 and 17:00 pm and 12.8mm fell in that first 15 minutes. At RAF Northolt and Pinner the highest concentrations fell slightly after at 17:15pm as the storm passed across the borough with 9mm and 7mm falling in that 15 minute period at each gauge respectively.

In addition the Northwood golf course has a rainfall gauge and this received 25mm in the 24hr period.

Transport for London has a gauge on the A40 at a similar location to the Environment Agency to inform the weather along this strategic road which indicates a similar amount of 12mm fell in that key hour. In addition to this they also utilise a private company⁵ for the provision of rainfall radar to inform them and their actions. This information is based on 1km grid squares for 24hrs starting at midday. This indicates much higher rainfall totals of over 30mm in the north of the borough in areas which were affected most.

Thames Water has indicated that they do not use rainfall gauges. They purchase radar data in one kilometre squares from the Met Office. As this is purchased data they are not able to share it with the Council. The information could therefore not be interrogated or compared to include within this document.

⁵ <http://www.metdesk.com/>

Thames Water has provided in May the peak return period for the streets where flooding has been reported to them. This data shows a significant variation in rainfall return periods. The data indicated peak rainfall return varying from a 1 in 14 year event (or a 7% probability of a rainfall of that intensity occurring in any year) to a 1 in 30 year event (or a 3% probability of a rainfall of that intensity occurring in any year).

3.1.4. River Levels

River levels can be seen by residents in real time through the government website within the Flood Information Service pages⁶.

After the event the detailed river level data was requested by the Council from the Environment Agency. The levels are taken at gauges on the rivers at certain points in the catchment on a 15min interval during a flood event. Map 2 shows the location of these gauges.



Map 2 Environment Agency Flood Warning gauge locations

⁶ <https://flood-warning-information.service.gov.uk/river-and-sea-levels>

3.1.5. River Pinn

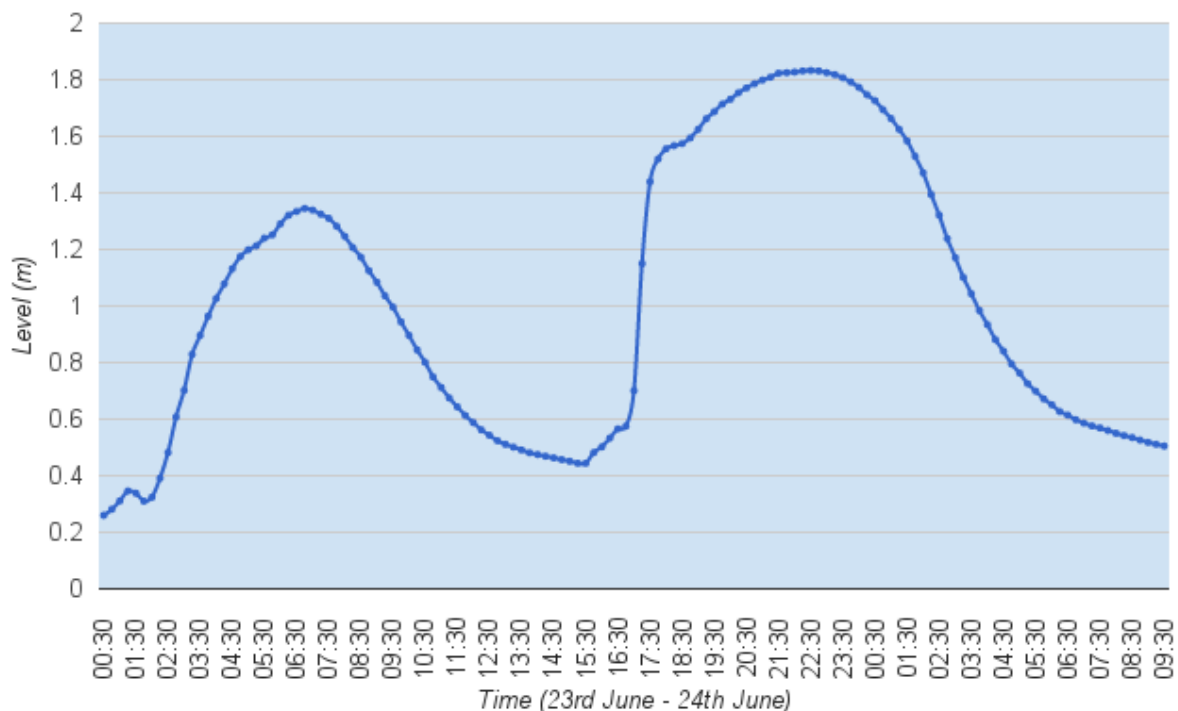
The following Table 2 shows the key information from the River Pinn relevant to those sites reporting flooding.

River Pinn	Site No	Flooding possible	Peak value	Date	Time	Previous Peak Value	Date
Ruislip FWS	2807	1.00	1.833	23/06/2016	22:30	1.514	01/02/2014
Swakeleys Road	2887	1.13	2.008	24/06/2016	00:30	1.962	30/10/2000
Uxbridge	2889	0.70	1.36	24/06/2016	06:00	1.89	09/05/1988

Table 2 Environment Agency River Pinn level data

The more detailed information from the Ruislip FWS gauge has been used to show more clearly the response of the River Pinn following the rainfall in the following graph.

The River Pinn responds quickly from the initial time of rainfall at 12:00 am on the morning of the 23rd June, however on a saturated catchment with much more intense rainfall even though volumes were considerably less the River Pinn responded almost instantaneously.



Graph 1 Environment Agency River Pinn levels at Ruislip FWS 23rd June - 24th June

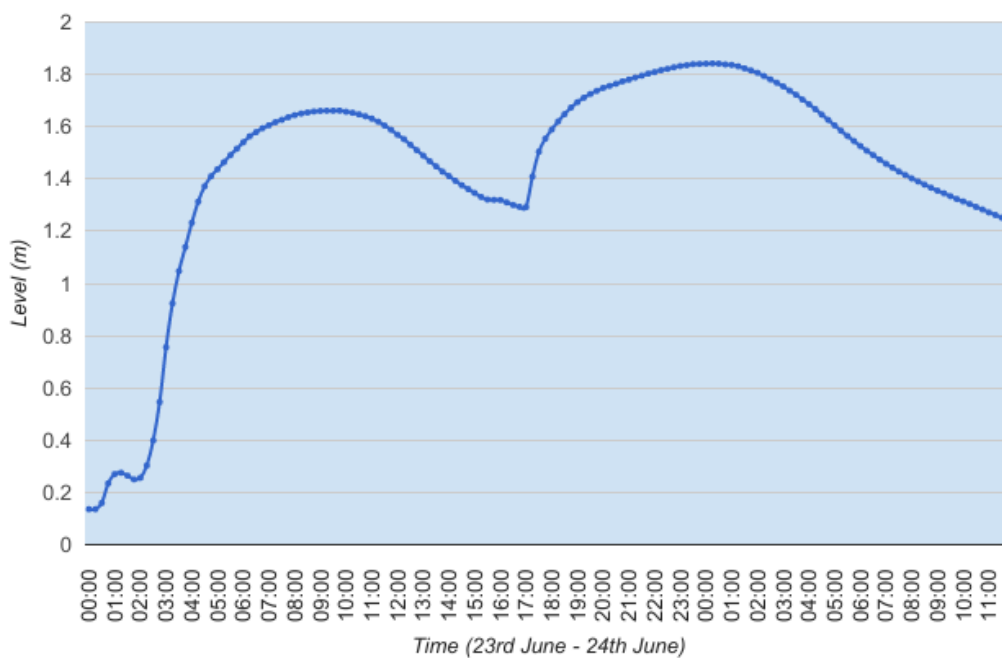
The River Pinn is known to respond quickly and can be observed to rise and fall back within banks in approximately 12 hours. Flooding is considered possible above 1m, a level which was reached twice on the 23rd June.

3.1.6. Yeading Brooks

Yeading Brook Gauges in Hillingdon	Site No	Flooding possible	Peak value	Date	Time	Previous Peak Value	Date
Yeading Brook East Northolt	3629TH	0.90	0.517	23/06/2016	18:30	0.79	13/10/1993
Yeading Brook West Gutteridge Wood	3625TH	1.58	1.842	24/06/2016	00:15	2.01	02/06/1999
Charville Lane	3635TH	2.00	2.105	24/06/2016	02:30	2.360	30/10/2000
Brookside Road	3650TH	2.08	1.142	24/06/2016	07:45	1.360	10/02/2009

Table 3 Environment Agency Yeading Brook river levels

The information from the Northolt Gutteridge Wood gauge as the location closest to major flooding on the A40 has been shown on a graph to highlight the response of the Yeading Brook to the rainfall.



Graph 2 Environment Agency Yeading Brook River Levels at Northolt Gutteridge Wood Gauge 23rd - 24th June 2016

The level information provided for these two gauges show that the Yeading Brook had responded to the rain from the morning of the 23rd June, and had not yet dropped back to normal water levels before the second heavy rainfall event. So this additional rain fell on an already saturated catchment. It took more than 24hrs for water levels to fall again to more

normal levels. Flooding is considered possible at this location above 1.58 m, which was reached twice on the 23rd June.

3.1.7. Analysis

Average rainfall for June in Hillingdon is 47.1mm, so approximately half of the months likely rainfall fell in a 24 hr period and a quarter of that was within 1 hour⁷. Although the totals of rainfall are not considered unusual, it is less likely in the South East, and that these volumes fell in such a short period of time.

With the last 3 key flood events in Hillingdon occurring in summer, it is clear that the significant flood risk facing Hillingdon is the management of surface water. However from the evidence collected, this in most cases is due to the rapid response of an urbanised catchment with increasing hard surfaces and the interrelated elements of the whole drainage system. For example surface water unable to drain away quickly enough to sewers or ordinary watercourses.

It is important that information from different sources can be compared. Establishing the 'Return period'⁸ (likelihood an event will occur) is useful for risk analysis and determining the **frequency of exceedance**^{8b} (number of times that it will exceed a critical value within a specified period of time) so that the likelihood of a similar event occurring can be considered, and used to inform future planning. It is considered critical to the application for funding for alleviation and used by some risk management authorities in determining whether any work is required. There will be a different return period for the rainfall event itself and the response that the river had to that rainfall.

Further work is required to establish the return period at each of these gauges. However using a basic formula based on the Bilham Formula (TRL Report LR595) as described in Urban Drainage (Butler, Davies 2004), from RAF Northolt the rainfall of 11.8mm over 60 minutes has a return period of approximately 1.1 years.

Thames Water has supplied peak rainfall return periods for the locations where sewer flooding has been reported to them. They have indicated they used Flood Estimation Handbook (Centre for Ecology and Hydrology - <https://fehweb.ceh.ac.uk/>) method to determine the return period. Thames Water indicated the rainfall used in this is based on radar information. This recorded rainfall of over 35mm in a 5min period. How this is then used to determine a return period could result in varying figures, which could mean the difference to residents whether work is considered in their area. For the Council it is useful that Thames Water has shared the return period, to provide residents with the clarity on when Thames Water may consider undertaking work and when they are not. However they also need to share the detailed methodology so that it can be analysed and compared to other data within the Investigation.

At this stage the Environment Agency has provided the raw data on request and the Environment Agency Hertfordshire and North London Office has now shared their draft report on **"Summer Thunderstorms 23 June 2016 Brent, Colne and Crane Catchments. Hertfordshire and North London Area dated April 2017"**⁹ There is no analysis of rainfall and information on the return period of the river levels within that document that can be incorporated in this report.

⁷ <http://www.metoffice.gov.uk/public/weather/climate/gcptm05c7>

⁸ https://en.wikipedia.org/wiki/Return_period

^{8b} https://en.wikipedia.org/wiki/Frequency_of_exceedance

⁹ If you wish to see a copy of the Environment Agency report please email their contact centre.

4. Summary of Impact

4.1. Definitions

Properties flooded	Hillingdon when referring to properties flooded to ensure consistency of comparison with other flood risk data collected by risk management authorities as those properties with internal flooding. This is taken to mean flooding above the floor boards, internally within a property. This is consistent with an approach taken by Department for Environment Food and Rural Affairs in administering Flood Resilience and Resistance grants for previous flooding events.
Properties affected	Hillingdon when referring to properties affected is referring to those properties affected by water external to the main residence ie gardens, garages and roads flooded
Significant flooding	Significant flooding which requires a formal investigation is considered to be those properties affected by Internal flooding, or which result in road closures to important infrastructure. Although as many reports of flooding are collected, not all will meet these definitions and will not be able to be included in a formal flood investigation.

Table 4 Definitions of flooding

4.2. Hillingdon

Over 63 homes and 25 commercial premises in the Borough are known to have been significantly affected in 36 different locations.

The key infrastructure closed were:

- The Metropolitan line was closed between Uxbridge and Rayners Lane after tracks were submerged under flood water.
- The A40 was also affected near Northolt, with a lane closed to traffic.
- Ruislip Manor Station flooded, and closed.

A large number of roads were also temporarily flooded, such as Cowley Road and Breakspear Road South some of which were inaccessible as a result, causing major delays in rush hour also preventing people from getting to polling stations for the EU Referendum.

Significantly impacted sites are explored in more detail in the next section.

The flooding reports are mainly from the Ruislip, Ickenham and Uxbridge areas, although there were some localised issues in Hayes and Northwood.

In summary the [Table 5](#) below shows the places where more than 1 home or commercial premises is affected in any one area, which from the investigation is determined to be linked to the same issue. [Table 6](#) contains these reports where 1 property was affected and [Table 7](#) lists the key infrastructure affected.

Location	Ward	Properties flooded (Commercial premises)	Properties affected	Total
1) Victoria Road, Commercial Premises and Ruislip Manor Station, Ruislip HA4 9A	Manor	(13)	0	13*¹⁰
2) Brook Drive, Brook Close and Evelyn Avenue, Ruislip HA4 8A	Eastcote and East Ruislip	13	5	18*
3) Broadwood Avenue and Park Avenue, Ruislip HA4 7	Eastcote and East Ruislip	8	20	28*
4) Wallington Close, Ruislip HA4 7Y	West Ruislip	5	3	8*
5) Regent Avenue, (Including Long Lane, Windsor Avenue) UB10 9A	Hillingdon East	4	36	40*
6) Alandale Drive, Northwood HA5 3U	Northwood Hills	4	3	7
7) Sutton Court Road, Uxbridge UB10 9H	Hillingdon East	2 (1)	3 (1)	7
8) Field End Road - Eastcote High Street, (also includes Hawthorne Avenue) Eastcote HA5 1R	Eastcote and East Ruislip and Cavendish	(3)	2	5
9) Hilliard Road, Hallowell Road, Church Road and Northwood High Street, Northwood HA6 1	Northwood Hills and Northwood	2 (2)	2	6
10) Kaduna Close and Joel Street, Northwood HA5 2P	Eastcote and East Ruislip	2 (1)	3	6
11) Church Road, Cowley, Uxbridge UB8 3N	Brunel	2	0	2
12) Pembroke Road, and Ruislip High Street Ruislip HA4 8N	West Ruislip	2 (2)	1	5
13) Eastcote Road, Eastcote HA4 8D	Eastcote and East Ruislip	2	3	5
14) King Edward's Road, Ruislip HA4 7A		2	1	3
Total		48 (22)	82 (1)	153

Table 5 Sites of multiple property reports of internal flooding

¹⁰*Sites verified by interviews

The following table lists the places where there are individual reports of internal flooding having occurred:

Location	Ward	Total
15) Briarwood Drive, Northwood HA6 1P 16) Chestnut Avenue, Northwood, Hillingdon, HA6 1H 17) Hillside Road, Northwood HA6 1P 18) Cuckoo Hill and Raisins Hill, Pinner HA5 2	Northwood Hills	4
19) Kings College Road, Ruislip HA4 7J 20) Meadow Close, Ruislip HA4 8A 21) Northview, Eastcote HA5 1P	Eastcote and East Ruislip	2 (1)
22) Fine Bush Lane, Harefield UB9 6L 23) Westcote Rise, Ruislip HA4 7L 24) Sharps Lane, Ruislip HA4 7J	West Ruislip	3
25) Glebe Avenue, Ickenham UB10 8P 26) Campden Road, Ickenham UB10 8E	Ickenham	2
27) Harefield Road, Uxbridge UB8 1P	Uxbridge North	1
28) Southbourne Gardens Ruislip HA4 9T	Cavendish	1
29) Lawn Close, Ruislip HA4 6E 30) Grosvenor Vale, Ruislip HA4 6J 31) Westfield Way at junction Beechwood Avenue, Ruislip, Hillingdon HA4 6H	Manor	2 (1)
32) Bury Avenue, Hayes UB4 8L	Charville	(1)
	Total	15 (3)

Table 6 Individual property reports of internal flooding

Location
a) Metropolitan Line near Ruislip Station, Ruislip HA4
b) A40 Northolt, Ruislip HA4
c) Breakspear Road South, Ickenham UB10 8H
d) Cowley Road, Uxbridge UB8 2

Table 7 Infrastructure reports of flooding

There have been over 116 other locations of flooding reported by residents of roads and front gardens and garages flooding. These are listed at the end of the report.

A number of sources have been used to collate this information. Only a limited number have been direct reports to the Council, not all were capable of being verified.

These lists also comprise flooding reported to Thames Water and the London Fire Brigade to which the Council has not been provided all the details. From a request by the Council in November, Thames Water provided a list of 18 reports of flooding which have used the 'Sewer Flooding Questionnaire'. If a resident has just called Thames Water they are not included on this list.

The Environment Agency have collated their own report of flooding, this was shared with the Council in May, this provided further reports of flooding in areas that the Council were not aware of.

There may still be other areas that the Council are not yet aware of, and in some cases residents have referred to neighbours having been affected, who have not reported the issue to the Council. The Council has continued to receive new reports.

4.3. London and the south east

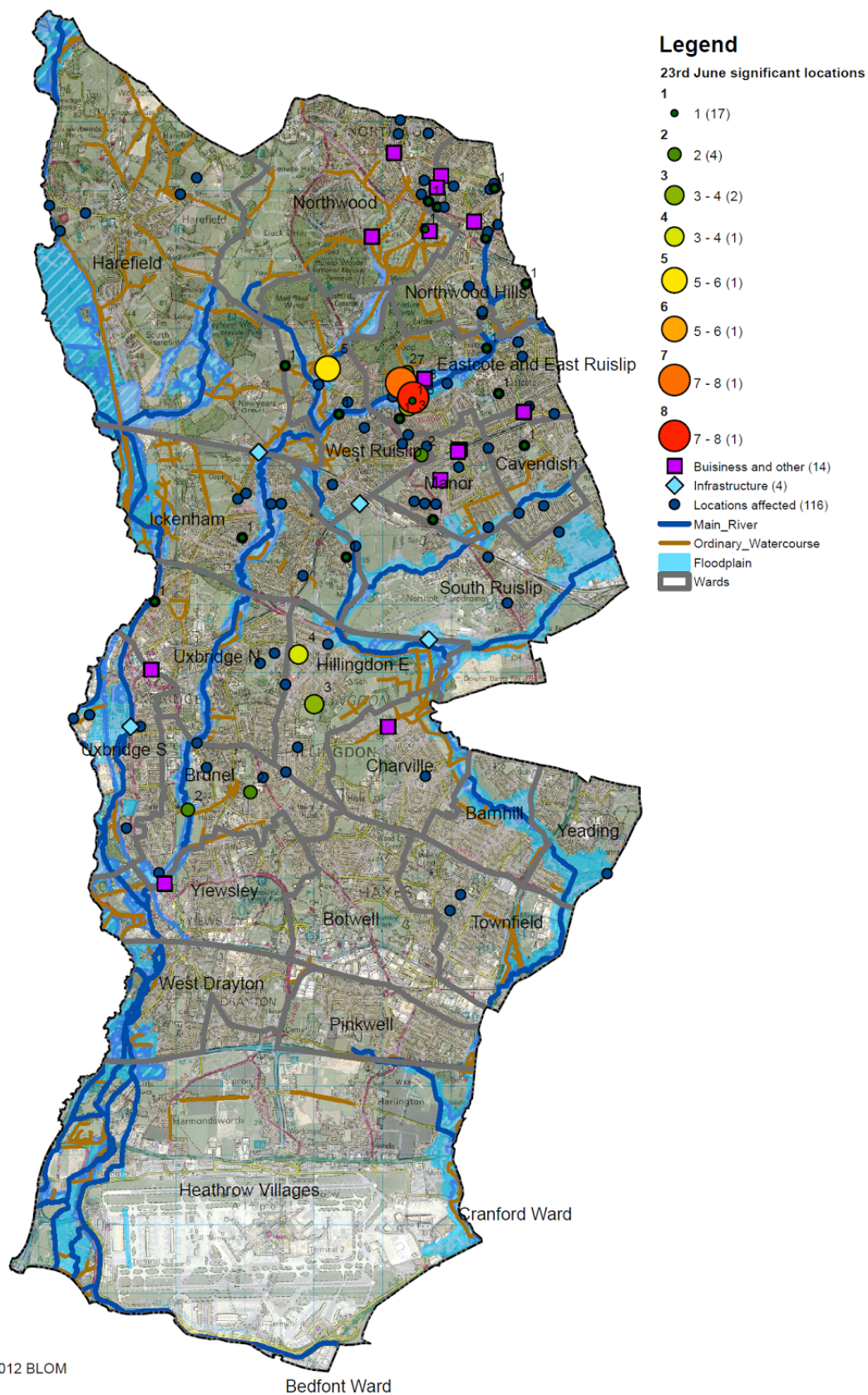
Hillingdon was only one of many areas affected by the rainfall on the 23rd June 2016. The impacts were felt in neighbouring Harrow and across other London boroughs, Hertfordshire and the south east.

The BBC provided a summary of the impacts in an article online "heavy rain in the South east" <http://www.bbc.co.uk/news/uk-england-36606200>

Referendum polling stations in Kingston and Barking were forced to close as 40mm (1.5in) of rain fell earlier. <http://www.bbc.co.uk/news/uk-36603508>

The BBC provide useful contact in "How wet has June been?" <http://www.bbc.co.uk/news/uk-36605901>

Motorists got into all kinds of mishaps after storms and flash flooding in Uxbridge and Ruislip <http://www.getwestlondon.co.uk/news/west-london-news/motorists-kinds-mishaps-after-storms-11521084>



Map 3 Locations affected on the 23rd June

5. Summary of Response

5.1. Initial response

5.1.1. Lead Local Flood Authority response

Hillingdon has a clear internal process in place through the Emergency Management Service. Adverse weather warnings are distributed within the Council so that officers in different services can take the appropriate action.

Following the proposed forecast provided by the Flood Forecasting Centre, and a review of the forecast rainfall by the MET office, the Council consulted the Environment Agency for their thoughts on the possible impacts within the Borough. At 14:00 it was considered by the Environment Agency that the worst impacts of the weather would pass to the north of the London Borough of Hillingdon.

The Flood and Water Management Officer called an internal meeting with key departments to discuss the forecast and ensure preparedness for the event. The Borough Emergency Control Centre was opened to hold this meeting.

In an emergency, and out of hours, Hillingdon has on standby a number of officers, from various departments such as highways, building control, green spaces and social care, to deal with specific queries for their service as well as Emergency Responses Officers ready to respond.

Torrential rain began at about 5.00pm in the areas around Ickenham, Uxbridge and Ruislip and within approximately 15-20 minutes caused large areas of standing water s.

The Council's Highways Service attended a number of sites over this period in advance of the flooding as well as visiting a number of structures across the borough to remove debris and thus reduce the likelihood of blockages.

During the event, the Highways service responded to reports from residents, replacing manhole covers and placing Flood signs to warn of dangers as identified by the team. These included Ickenham Road, Victoria Road, Park Road, Vine lane, Field End Road(eastcote High street), Breakspear Road South and Honeycroft Hill.

5.1.2. Other Risk Management Authorities (RMA) responses

The Council has since contacted other partner organisations to request information on the response to the event they gave which is provided below:

Thames Water received a large number of calls, and took actions in response to these calls, attending site in some cases. Non-confidential information of the flooded properties who had completed the sewer flooding questionnaire were shared with the Council and indicated initially 18 locations in November and this has more recently in June been updated to 22 locations of flooding.

The Council also contacted the **London Fire Brigade(LFB)** after the event to ask for their call outs regarding flooding, so that a fuller picture of those affected could be obtained. The LFB were contacted by residents on flooding related matters on 62 occasions on the 23rd June only 7 of which the Fire Brigade could take action, the rest they could only provide advice. In most cases this was because the event occurred so quickly they could not respond before the flooding had occurred.

The **Environment Agency** as a result of the rainfall forecast and the potential significant impact on main rivers, opened their incident room at 07:00am on the 23rd June. Their Operations teams also have a flood rota where they attend key hotspots across the North

London and Hertfordshire area. These are on a **Flood Rota Pinn 1** which includes Ladygate Lane and Glovers Grove on the Cannon Brook, Copthall Road Footbridge. In addition other officers are sent to site as Flood Data recorders to observe the response on the ground and provide feedback to the incident room. Officers as specified in the Environment Agency report dated April 2017 and shared with the Council in May attended Alandale Drive in Northwood, Joel Street in Eastcote, Brook Drive, Ruislip, Swakeleys Road, Hercies Road, Cowley Road in Uxbridge, and Thorney Mill Road in West Drayton.

Transport for London attended the A40 between Swakeleys Roundabout and the Polish War memorial and London Underground also responded to ensure transport infrastructure was functioning again as soon as possible after the event.

5.2. Investigation

5.2.1. Why Investigate?

This event is considered by many to be unprecedented weather. However the Council want to ensure that flood events are investigated properly to ensure that the extent and impact of any event is understood.

Determining the contributing factors are being managed appropriately by all flood risk management bodies where they are responsible, and the actions taken by bodies is transparent to residents.

Investigation is recommended by the Surface Water Management Plan Appendix C Actions. In addition, under Section 19 of the Flood and Water Management Act 2010 Hillingdon as a Lead Local Flood Authority (LLFA) consider investigation into this event appropriate.

5.2.2. Information Collection

Residents

The focus on evidence collection has been on those significantly affected ie properties and commercial premises that have flooded internally, not those affected by garages and front gardens flooding. Unfortunately given the scale of events such as these there is insufficient resources to visit and check all reports.

The impact of this event was significant to a large number of residents whose houses were flooded internally, so significant they have had to move out for over 6 months. However the extent to which residents were affected was only evident as time passed. This is as many residents have advised that in the immediate events they were focused on the prevention of flooding rather than reporting.

Evidence has been collected from the numerous calls, emails and letters that the Council has received over this period, as well as meetings with residents.

In large areas the Council have had one report from a resident, which has referred to others being affected. In these cases further proactive work was done to establish the full picture of flooding, to inform the priorities for future work, which the Council is continuing to do.

In addition interviews and questionnaires were distributed in October to further clarify those affected in Park Avenue, and Broadwood Avenue, Brook Drive and Evelyn Avenue and Wallington Close. Commercial premises that were identified in key areas such as Victoria Road and have also been interviewed including London Underground.

Local Media

Local media reports have also been invaluable in providing useful photographic evidence of the extent of flooding.

Organisations

Requests have also been made to other flood risk management partners for information. A Hillingdon Resilience Forum was held on July 7th 2016 at which it was confirmed formal requests would be made to authorities for information on their response to the flooding in the Borough.

The Investigation is more limited than the Council would like due to the difficulty and time taken to obtain information from other risk management partners. However it is recognised that these powers of investigation are new to Local Authorities and Risk Management Authorities and processes are evolving to establish better ways of working together.

For example Thames Water has provided their process for sharing data and taking action. Twenty two locations have at this time filled in the Thames Water sewer flooding questionnaire. In November this number was eighteen. This list is then used by Thames Water to establish a programme of work. Some information on the return periods and actions has been provided.

Events

The largest number of residents that have been affected by internal flooding from reports was Brook Drive, and Evelyn Avenue. A meeting was therefore organised by the Council and held with those residents on the 27th September 2016 to provide an opportunity for residents to provide information to the Council and the Environment Agency, about what happened and when and ask questions about the roles and responsibilities of different parties.

Although best efforts have been made to collate as much information as possible relating to this event, it is recognised that there will be other places affected not included in this report. This is why the report was published on the Council website in draft for feedback initially. The report was sent to all those affected and key local groups that could pass this report on to other residents that may also have been affected.

In addition the Council ran a residents flood forum on the 17th May 2017 to which all residents that were affected were invited to along with other key groups such as Ruislip, Ickenham and Eastcote Residents Associations and Friends of the River Pinn groups so that issues could be discussed.

5.2.3. What the Investigation is not required to do.

It is not required by the Flood and Water Management Act for this report to provide the solutions in every case, simply to see if the flood risk management authority has undertaken their statutory duties.

However the Council has taken the decision to invest time to ensure the actions taken have been included where possible, and some of the options and plans to reduce risk that organisations are considering for the future.

There will be continuing dialogue with these organisations going forward.

In most areas there is ongoing work which will continue, which will be undertaken to determine the appropriate flood risk management authorities if it is not clear at this stage and to progress recommendations made.

This includes the addition of the locations of flooding to the Surface Water Management Plan (SWMP) Action Plan. Further information is contained in the actions section of this document.

It is recognised that this report may not include the detail on each location that every resident may wish to see. Once this report has been finalised and then formally published there is no plan to update the final report on the progress in each location or for any reports of flooding on roads. This investigation marks a point in time.

6. Conclusions

What is clear from the incidents reported that a number of events although seemingly isolated are linked. Although disruptive where water is on roads and in open space, areas where this water ponds provide useful storage, which prevent issues from being worse downstream.

Information from this investigation has been provided to other risk management authorities prior to the publication of the document, and they have had the opportunity to provide further information.

However, the Flood Investigation is more limited than the Council would wish. The Council would like to see better coordination and data sharing between authorities so that resources can be used more efficiently.

The roles and responsibilities of different organisations are still unclear to residents and even within organisations themselves. Even with the introduction of the Flood and Water Management Act in 2010 which was aimed to provide clarity on roles and responsibilities by introducing lead organisations for specific risks.

Information is provided for residents in [Section 8 Roles and responsibilities](#). This information is also contained on the Council website, [flooding pages](#).

Site specific actions are contained in the appendices that have been taken by various bodies in the short term and where possible what they plan in the longer term as this investigation has advanced.

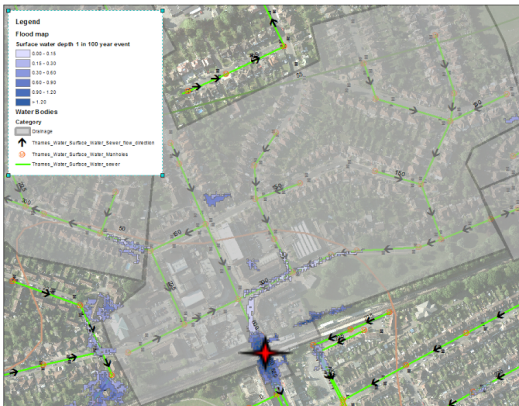

The Council has included generic actions within [Section 9](#) in this document. These cover the whole Borough. These are in line with the Local Flood Risk Management Strategy and are designed to reduce flood risk.

The various risk management authorities have all contributed in varying degrees to this investigation, and there is no evidence to suggest they are not complying with their statutory responsibilities. However, the timescales taken to provide evidence is clearly an area all authorities need to improve upon, so that the focus can more quickly be on to taking action to reduce flood risk.

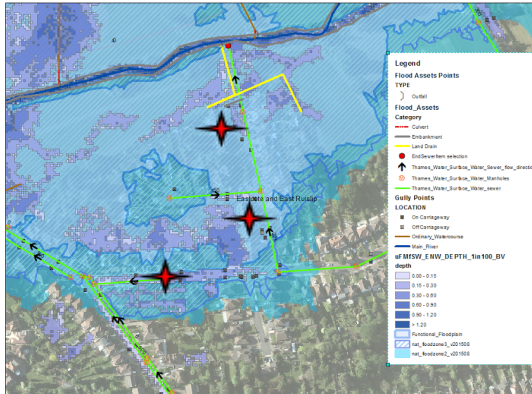

7. APPENDICES

7.1. Significant flooded areas

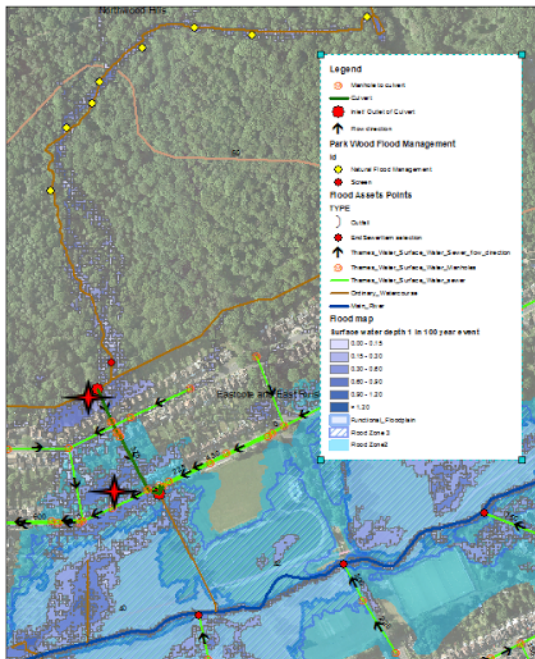
7.1.1. Multiple homes or business flooded.

Area affected	1) Victoria Road, Commercial Premises and Ruislip Manor Station, Ruislip HA4 9A		
Date of flooding	23/06/2016		
Grid Reference	X 510077 Y 187234		
Land ownership	LU, LBH Adopted Road and Commercial Landowners		
Map of Area			
Location of flooding marked as a red star. Grey outline - Thames Water catchment.		Photographs taken from resident Simon Rowley published on Get West London http://www.getwestlondon.co.uk/news/west-london-news/motorists-kinds-mishaps-after-storms-11521084	
			
Flooding duration	Evening 6.00 - 9.00pm		
Source of flooding	Surface water		
Cause/ Pathway	Heavy rainfall could not drain away quickly enough, causing water to pond under the bridge.		
Impact of flooding	Flooded internally - Commercial		13
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		0
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from river (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		Yes
History of flooding	1952 road flooding, 23rd Jan 2009 road flooding, 28th July 2014, August 26th 2015, June 8th (47.2mm in 2 hrs), and 23rd (13.6mm within 1hr) subsequently on the 15th September 2016 (8.2mm within 2 hrs at Pinner)		
Summary	After a short and intense period of rainfall, the surface water sewers were overwhelmed causing flooding		

London Borough of Hillingdon	Actions completed	<p>Highways Maintenance Service - In addition to the normal annual gully maintenance, the Council checked the gullies to ensure they were functioning after the event. Gullies will be maintained more frequently by the Council Highways service as an area of higher priority.</p> <p>The Service has also put in place warning signs and considering gauges to indicate depths of potential flooding so that cars do not attempt to drive through.</p> <p>The Council Flood and Water Management Officer conducted interviews with commercial property owners and established an number were London Underground tenants.</p> <p>Met with London Underground to understand the impact on the station with the maintenance manager and ensure the commercial side were aware. Further advice was provided to London Underground on roles and responsibilities of different organisations and options that they could take to reduce flooding, to protect themselves and tenants.</p> <p>Attended a Traffic Liaison Meeting, with TFL and London Buses to ask if bus stop arrangements can be altered to minimise the impact.</p>
	To be completed	<p>Transportation and projects team is considering the swapping of the bus stop with the car parking so that cars do not park in the area at highest depth of flooding, however it is not normal practice to have bus stops at the same point in the road.</p> <p>Parking Services team - To consider reducing runoff from nearby Council owned car parking as and when they may be scheduled for maintenance.</p>
Action by Thames Water	Actions completed	<p>Thames Water is responsible for the surface water sewer that the gullies drain into. Thames Water attended the next day (24th June) to ensure that the sewer was operating correctly, no issues were found.</p> <p>London Underground met with Thames Water. Thames Water stated that no further action is proposed by them.</p> <p>Thames Water consider the rainfall that fell to be a 1 in 22 year event.</p> <p>Commercial properties owners are encouraged by the Council to report flooding to Thames Water and fill in their Sewer flooding questionnaire.</p>
	To be completed	<p>To write to all residents affected by the removal of the culvert from the Thames Water Sewer Maps and advise residents on their new responsibilities</p>
Action by Transport for London (London Underground - Maintenance and Commercial arms)		<p>Collate information on previous events, the event, costs of closure, impact to tenants, consider potential future blight on premises with increases in insurance without support to inform future decisions.</p> <p>Investigate responsibilities as a Commercial premises owner to 2 tenants in preventing flooding to them and station. TFL Commercial Properties has confirmed to the Council that there are no proposals to carry out any works to the commercial properties. It would be a matter for the tenants to take preventative measures to protect their shops against water ingress with the use of seals/protection to the entrance doors to prevent any flooding.</p> <p>Investigate options available to them to reduce the surface water run off from their site (tracks and building) into the Thames Water sewers. London Underground are planning to implement a flood reduction scheme. They are looking at the feasibility of installing flood protection to the drainage and also removing the threshold channel drainage at the station entrance. They are also considering installing demountable flood barriers to the station entrance which will be put in place at times of future flooding. There is no feedback at this stage from the commercial arm of London Underground who lead on the issues facing their tenants.</p> <p>Report events to the Council and Thames Water in future. Share with and discuss with the Council as the Lead local Flood Authority, any actions considered.</p>

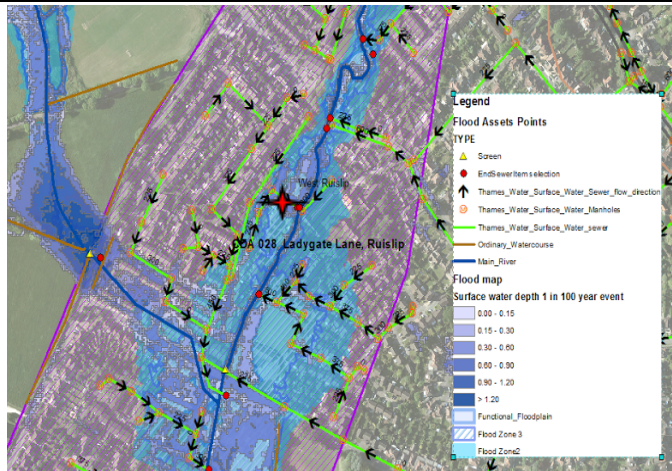

Area affected		2) Brook Drive, Brook Close and Evelyn Avenue, Ruislip HA4 8A	
Date of flooding		23/06/2016	
Grid Reference		X 509443 Y 187988	
Land ownership		LBH and Residents	
Map of Area			
Location of flooding marked as a red star		Photo from resident	
			
Flooding duration		Evening 6.30 - 12 midnight	
Source of flooding		Surface water then main river	
Cause/ Pathway		The River Pinn burst its banks thereby restricting the ability of the surface water sewers to discharge and overwhelming them	
Impact of flooding			Brook Drive Evelyn Avenue
		Flooded internally	10 3
		Flooded under floorboards	1 0
		Affected (ie gardens and front drive/garages)	4 0
Evidence		Reports from residents	Yes Yes
		Identified on the flood map for surface water	Yes Yes
		Identified at risk of flooding from river (Flood Zone)	2/3/3b 2/3
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No No
History of flooding		Brook drive has previously flooded a number of times from the River Pinn, including 1977, 2013, 2014 and 2015. Evelyn Avenue in 1977.	
Summary		An unusually extreme amount of rain fell over only an hour, causing the water levels in the River Pinn to rise, this caused surface water sewers not to be able to discharge and water backed up and couldn't flow away from the roads. Water also built up in the fields behind the properties	
London Borough of Hillingdon		Actions completed Highways Maintenance Service - In addition to the annual maintenance the Highways service have checked and cleared the gullies, to ensure that the rain had not washed further debris into the gullies blocking them. Gullies will be maintained more frequently as an area of higher priority. Green Spaces - The Council have checked the drainage within the Kings College Playing fields managed by the Green Spaces team. Flood and Water Management Officer - The Council organised a meeting on the 27th October 2016 for residents to report issues and explain the roles and responsibilities.	

		<p>The Council in conjunction with the Environment Agency have already identified this area as an area at high flood risk and are looking at flood alleviation options along the River Pinn. This will include looking at options which could provide flood risk benefit to this area.</p> <p>The Council has met with Thames Water and specifically requested feedback on the action they have taken on a number of occasions.</p>
	To be completed	<p>The Council Flood and Water Management officer will continue to work with the Environment Agency to progress the options to alleviate flooding along the River Pinn.</p> <p>The Council Highways Maintenance Service will:</p> <p>1) Nominally raise kerbing to crossover o/s 139/141 Evelyn Avenue - A Task Order has been raised for these works however these works were put on temporary hold until a level survey was undertaken.</p> <p>2) Level Survey - The level survey will identify any low spots and amount of existing cross/longitudinal falls. This has now been completed and the results are being evaluated.</p> <p>3) CCTV Survey - A Task Order has been issued. This survey will determine the layout, size, condition of the drainage pipes etc. Please note that the "missing" section of TW sewer could simply be an unmapped section that exists but is not shown on the current Thames Water records that would have to be updated. The CCTV survey will reveal the exact configuration and layout.</p> <p>4) Gullies added to critical gully list to be cleansed four times per annum.</p>
Action by Thames Water		<p>The residents have advised the Council they have called to report flooding to Thames Water. However Thames Water provided their sewer flooding database of flooding reports in November to the Council, this location is not on the list provided by Thames Water, so that it would appear Sewer Flooding Questionnaires have not been filled in.</p> <p>Thames Water have undertaken cleaning of a section of the surface water sewer in Evelyn Avenue, and surveyed a section of the surface water network in Brook Drive.</p> <p>On Brook Drive on 26/06/2016 the camera survey found a belly in the foul sewer line and several lips. On 15/08/2016 it was identified that subsidence had caused the belly and that the pipe needs to be replaced. On 08/06/2017 the replacement of 10 m of pipe was completed. This does not relate to the flooding.</p> <p>On Evelyn Avenue on 02/2017 a clean and survey of 68m of the surface water line was carried out and silt/debris was cleared and it was identified that concrete may be in the line. On 03/2017 the line was camera surveyed and pressure jetted. Roots and concrete were identified in the line. 04/2017 a potential belly was identified and the manholes in the gardens were found to have been altered to be too small to allow full investigation. 05/2017-06/2017 works are ongoing to rebuild the manholes to allow further investigation.</p>
Action by the Environment Agency		<p>The Environment Agency issue flood warnings, and issued a number of warnings based on the forecast of the weather and response of the River.</p> <p>The Flood Warning was received by the residents after they were flooded.</p> <p>The Environment Agency have since checked the trigger levels for issuing warnings from the River Pinn. In this event it appears that flooding was initially from the sewer because the river was high the river only later came out of bank. The warning level is considered for</p> <p>Residents requested information on the maintenance of the river and the dredging of the River Pinn.</p> <p>The Environment Agency have confirmed they will engage with residents on the potential options for Flood Alleviation on the River Pinn, when the consultants are engaged, and a programme developed.</p>


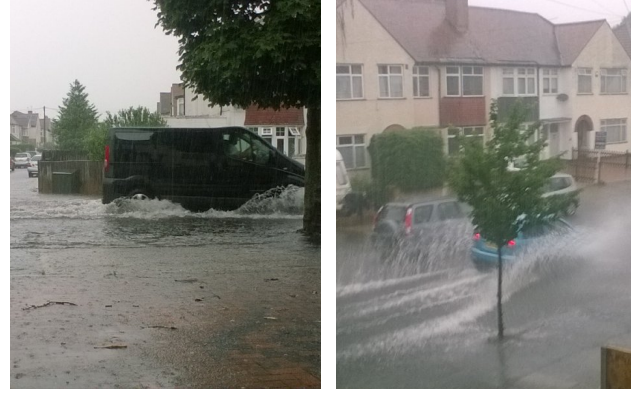
Area affected	3) Broadwood Avenue and Park Avenue, Ruislip HA4 7		
Date of flooding	23/06/2016		
Grid Reference	X 509278 Y 188318		
Land ownership	LBH and Residents		
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration	Approximately evening 5.30pm - 4.00am		
Source of flooding	Ordinary watercourse, from Park Woods and surface water		
Cause/ Pathway	Multiple overland flow routes. Water from the woods, from two different directions meet at the rear of no 58/60 Broadwood Avenue and flows into a culvert. When the culvert was full, water backed up and flowed out of the ditch and into rear gardens on Broadwood and down the side of houses. Water also built up on the roads and flowed into the rear of houses on Park Avenue. Water on Park Avenue observed coming up from manhole outside no 95. Water was observed exiting the gullies from the surface water sewer.		
Impact of flooding		Broadwood	Park
	Flooded internally	2	6
	Flooded under floorboards	0	4
Affected (ie gardens and front drive/garages)		0	16
	Reports from residents	Yes	Yes
	Identified on the flood map for surface water	Yes	Yes
Evidence	Identified at risk of flooding from river (Flood Zone)	2	2/3
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No	No
	History of flooding	As the area was developed natural watercourses draining the woods have been piped. In 1977 and approximately 2003 Park Avenue and Broadwood Avenue were flooded. In addition heavy rain affected the area on 8 May 1988.	

		An Affinity water main which lies within Park Woods burst on 18 October 1994, 15 August 2012 and affecting Bury Avenue when it burst again in 8 March 2017.
Summary		An unusually extreme amount of rain fell over a very short period of time (approx half an hour to an hour). The capacity of the culvert underneath Broadwood and Park Avenue was overwhelmed and water then flowed out of the ditch in Park Woods and across lower lying areas identified by the surface water maps and into homes. Pressure also built up within the pipe between the woods and the playing fields causing a manhole to be dislodged on the road.
London Borough of Hillingdon	Actions completed	<p>Highways - In addition to the annual clearance, the Council Highways Service have checked and cleared the gullies subsequent to the event. One gully on Park Avenue was not running but this was jetted and restored to working order. Gullies will be maintained more frequently as an area of higher priority.</p> <p>Green Spaces - As a Landowner the Green Spaces team manage the Park Woods. Ruislip woods are an ancient woodland managed as a SSSI. Suggestions put forward by residents were reviewed by the Flood Risk Team and the Green Spaces Service have undertaken these, clearing a pond to create more space for water and implementing some natural flood management measures to hold water back. This will not prevent flooding completely but will provide more space for water within the woods in a way which does not compromise the management of the woods as a SSSI. The Council has also replaced the broken screen and put in a hand rail at the entrance of the culvert. This screen is cleared once a week and in addition checked when there is adverse weather forecast.</p> <p>The Green Spaces team also manage Kings College playing fields, that the culvert drains into. This ditch is cleared regularly by the service.</p> <p>Flood and Water Management - A further meeting was organised by the Council with Thames Water in February 2017 to discuss the issues here and elsewhere on the action that Thames Water are taking, and ensure that they undertake appropriate correspondence with all interested parties including the Council. The Council legal team has also written to Thames Water to request a formal position on the matter.</p> <p>Residents have also expressed concern regarding the likelihood of an Affinity supply pipe bursting - indicated by a recent burst in March 2017, which fortunately did not result in property flooding. The Council have raised these concerns with Affinity and arranged for Affinity to visit the area, to understand the implications a meeting which residents attended. Dialogue with Affinity will continue.</p> <p>An application for funding has been made to expand the natural Flood Management in Park Woods. The application was 1 of 34 submitted to the local area office and has been successful in being the top two put forward to the national review.</p>
	To be completed	<p>Green Spaces - Further discussion with Affinity will be undertaken on Affinities plans both in the short term and long term.</p> <p>Highways Service - Residents have requested a review of the speed table to allow water to flow along the road, and away into other gullies and sewers.</p> <p>Flood and Water Management Officer - The Council is planning to expand the natural flood management, already implemented. This takes on board advice from the Environment Agency and working with other organisations. Further information can be found on a leaflet produced for the Residents Flood Forum on the 17th May 2017</p> <p>The Council is also providing feedback to national body developing a protocol on the transfer of assets to ensure that an appropriate process is developed for the future, in similar situations to ensure there better understanding of what asset management means to potential riparian owners.</p>

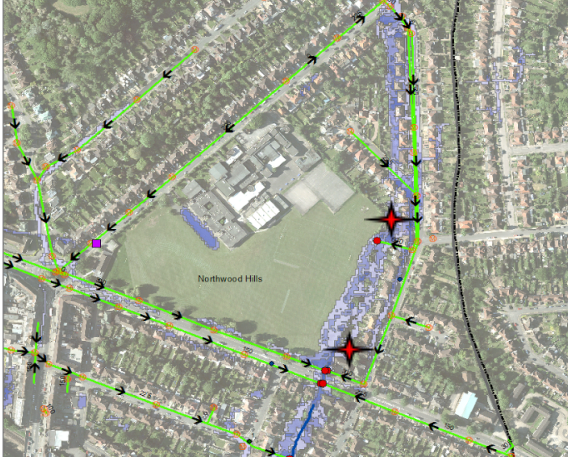

Thames Water	Action taken	<p>Residents reported the issue and Thames Water checked the manhole outside no 95. They have provided a replacement heavy duty manhole cover that should reduce the likelihood of excess flow in the pipe lifting it.</p> <p>Thames Water have not advised the Council of any meetings they have had with residents and have not advised of the outcome of such a meeting, despite a number of requests subsequently. It is not on the sewer flooding database provided by Thames Water so it would appear that Sewer Flooding Questionnaires have not been filled in.</p> <p>Thames Water cleared the surface water sewers on Park Avenue on 19th October. Thames Water have also undertaken a condition survey of the culvert which shown the pipe to be in a good condition.</p> <p>Since this time residents advised the Council that Thames Water had written to them to advise the culvert was no longer Thames Water responsibility. Thames Water have written to the Council stating that they believe responsibility for the culvert will pass to riparian owners.</p>
	Action to be taken	A senior case officer leading on this has provided feedback to the Council on the next steps they intend to take, which includes advising those residents affected on the Thames Water position and providing the CCTV of the culvert condition.
Action by Affinity Water	Action taken	Affinity Water advised in February 2017 that they were undertaking a condition survey of the supply pipe, after the Council conveyed the residents concern about burst pipe. The pipe then burst again in March affecting a different area along Bury Street. Further information is provided in leaflet drafted for the Residents Flood Forum on the 17th May 2017.
	Action to be taken	<p>In addition Affinity are improving their leak detection system to improve the speed at which they can respond to a burst and notifying the Council should this occur on Council land.</p> <p>They are working closely with the Council to arrange the condition survey and any works they plan within the Park Woods as well as options to contribute to any flood mitigation.</p>
Residents	Actions taken	<p>Road was closed by residents to traffic to prevent cars using the road causing waves as traffic went through the water, making the flooding impact worse. The Council thank residents for useful suggestions on what could be done in the woods to help mitigate flooding. A meeting was held with Council employees and the residents on the 26th October 2016 to discuss these suggestions.</p> <p>A number of residents are also part of 'Friends of Pinn Meadows' which contribute to the wider management of the area and undertake work on the rivers. Further info can be found http://www.thames21.org.uk/event/friends-of-river-pinn-clean-up-2/</p>
	To be completed	<p>The public sewer records status of this culvert is being questioned by Thames Water.</p> <p>Future flooding from the culvert should be reported to the Council.</p> <p>The culvert will be residents responsibility.</p> <p>Council advises residents to undertake a personal and a Community Flood plan, and ideally form a Flood Action Group advice on this can be found on the Council flooding web site pages.</p>

Area affected		4) Wallington Close, Ruislip HA4 7Y	
Date of flooding		23/06/2016	
Grid Reference		X 508177 Y 188375	
Land ownership		Land Owner - residents and LBH (St Catherines Court)	
Map of Area		Photo	
Location of flooding marked as a red star Critical Drainage Area in purple		Photo provided by resident facing the Cannon Brook	
			
Flooding duration		From late afternoon to 1.00am on the 24th June	
Source of flooding		Main river - Cannon Brook	
Cause/ Pathway		Flooding from the Cannon Brook	
Impact of flooding		Flooded internally	5
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	3
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	3b
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	Yes
History of flooding		A similar event occurred 15 years ago, and in 1988 and 1977.	
Summary		An extreme amount of rain fell within an hour, causing the water levels in the Cannon Brook to rise suddenly.	
London Borough of Hillingdon	Actions completed	<p>The Flood and Water Management Officer provided clarification to residents on roles and responsibilities.</p> <p>As residents are Riparian owners are responsible for their side of the Cannon Brook. The Council have written to the Environment Agency on a number of occasions to request the Environment Agency provide more support to residents on what 'Riparian' responsibilities mean in this context.</p> <p>Housing Service The Council as a landowner is responsible for St Catherine Farm Court and the adjacent bank.</p> <p>Green Spaces Service - Manage the Ruislip Lido. Further information has been provided to residents on the management of the Ruislip Lido. Water in the Ruislip Lido reservoir upstream is managed carefully and regularly by the Council. Water from the Lido is discharged through some small valves which</p>	



		<p>limit the discharge. These were not open during the flood event in anticipation of the rain.</p> <p>A Flood Risk Assessment was undertaken for works at the Ruislip Lido and it recommended a number of actions to reduce flood risk along the Cannon Brook. The Council have acted on these recommendations and replaced the debris screen at Ladygate Lane and cleared debris and silt from the river near Howletts lane as part of these works in 2014.</p> <p>Highways Service - The Council clear the Lady Gate screen twice a week, and additionally when bad weather is forecast.</p>
	To be completed	<p>Highways Service - Will consider the resurfacing of the adopted public footpath once any work of bank protection has been undertaken.</p>
Action to be taken by the Residents		<p>The residents have collected evidence of the issues at Wallington Close and have identified a low spot on the bend of the river where they believe flow first came out of the Cannon Brook Main river.</p> <p>The residents are responsible as Riparian Owners for maintenance of their part of the Cannon Brook.</p> <p>It is recommended they all write their own personal floodplans, and purchase flood protection measures such as Flood doors, and where possible create a Flood Action Group.</p> <p>If residents are concerned about blockages on the debris screen, contact the Highways Service via the Contact Centre to ask them to clear it.</p>
Environment Agency	Actions completed	<p>The Environment Agency are the lead risk management authority for main rivers. They have powers to work on these rivers to manage flood risk. So the Environment Agency undertakes some maintenance work, but this varies by location dependant on risk. They publish on their website a yearly maintenance programme https://www.gov.uk/government/publications/river-and-coastal-maintenance-programme</p> <p>However it is a Riparian owner's responsibility to maintain the Cannon Brook.</p> <p>This programme for 2017-2018 consists of clearance of the channel once a month, which is an increase over the level of maintenance in previous years.</p> <p>Environment Agency officer have also visited the site and Wallington residents to review the situation. They have commissioned a survey of the channel to review a low point on the bend of the main river that residents have identified to see if further work can be done to protect residents.</p>
	To be completed	<p>The Council has requested that as a body experienced in maintenance that further help and support is provided by the Environment Agency to residents and the Council. This would explain in more detail exactly what the Environment Agency do and when and identify what else other should do to help maintain the watercourse to an appropriate standard. They have an officer starting to deal with communication on maintenance.</p> <p>The Environment Agency have committed to providing further support and advice for residents to form Flood Action Groups.</p> <p>A gauge is being implemented at Howletts lane which in two years could provide a warning service to the Cannon Brook, the housing for this is in place.</p>
Action taken by Thames Water		<p>Thames Water have established that they believe the rainfall in this location was a 1 in 28 year event. A Camera survey of the sewer has been undertaken and is currently being reviewed.</p>



Area affected	5) Regent Avenue, (Including Long Lane, Windsor Avenue) UB10 9A	
Date of flooding	23/06/2016	
Grid Reference	X 507769 Y 184221	
Land ownership	Land owner	
Map of Area	Photo	
Location of flooding marked as a red star Critical Drainage Area in purple	Photographs taken from social media/resident showing Windsor Avenue.	
		
Flooding duration	Approximately 6:30pm - 7:30pm	
Source of flooding	Surface water	
Cause/ Pathway	Water flowed down Victoria Avenue into Regent Avenue and couldn't drain away. Water built up in the park in Brighton Close to the rear of properties along Regent Avenue spreading out into gardens. Windsor Avenue also experienced water building up on the road.	
Impact of flooding	Flooded internally	4
	Flooded under floorboards	0
	Affected (ie gardens and front drive/garages)	36
Evidence	Reports from residents	Yes
	Identified on the flood map for surface water	Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)	No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	Yes
History of flooding	Regent Avenue previously has also flooded in 2014. Long Lane in 2015. Windsor Avenue in 2013 and 2014.	
Summary	After a short intense period of rainfall, lasting for approximately an hour, the surface water sewers were overwhelmed causing the roads to flood, restricting access, significantly slowing down traffic flow and flooding some back gardens. Flooding was suggested to have been made worse by cars travelling down the roads.	
Actions by London Borough of Hillingdon	<p>Highways Service - The Council has listened to a Petition drawn up by residents. The Council minutes of the Petition Hearing on the 18th Jan provide further detail of the roles and responsibilities.</p> <p>Gullies on Regent Avenue will be maintained more frequently by the Council Highways service as an area of higher priority.</p> <p>As requested Cllr Burrows has written to Thames Water to ask about the action they have taken to reduce the risk to residents.</p>	

Residents	Actions Completed	Residents have reported this to the Fire Brigade Ref 0792472306 2016 and Hillingdon Parks 5200936, and produced a petition.
	To be completed	The Council recommend residents draw up a Personal Flood Plan, and purchase products to protect homes from flooding such as air brick covers. As Regent Avenue does not appear on Thames Water's sewer flooding records, the Council recommends residents should report this to Thames Water and fill in the Questionnaire .
Action by Thames Water		Thames Water has received a single property request to clean up after a flooding event.



Area affected	6) Alandale Drive, Northwood HA5 3U	
Date of flooding	23/06/2016	
Grid Reference	X 510691 Y 190547	
Land ownership	Northwood School, private residents and LBH adopted highway	
Map of Area	Photo	
Location of flooding marked as a red star	Photo from residents of the rear gardens	
		
Flooding duration	Approximately 1 hour	
Source of flooding	Surface water and ordinary watercourse - Joel Street Ditch	
Cause/ Pathway	Surface water flowed down Alandale Drive from the direction of Potter Street. This water couldn't drain away into sewers flooding those on Alandale from the front. As water drained away into the sewers, these drained to the rear of properties into Joel Street Farm Ditch which then overflowed into gardens down Alandale Drive.	
Impact of flooding	Flooded internally	4
	Flooded under floorboards	0
	Affected (ie gardens and front drive/garages)	3
Evidence	Reports from residents	Yes
	Identified on the flood map for surface water	Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)	No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding	The Joel Street Farm Ditch, which runs alongside Joel Street and next to Briarwood Drive, has frequently been the cause of flooding of gardens over the past few years.	
Summary	After a short intense period of rainfall, the road became flooded as the surface water sewers didn't have the capacity to take the water. Water built up on the road and properties were flooded internally as a result. These sewers drain into the Joel Street Ditch to the rear of Alandale and the ditch then overflowed into gardens.	

London Borough of Hillingdon	Actions completed	<p>For the sites to the south of Alandale Road, the redevelopment of the Northwood school will reduce the runoff from the site and the school is now aware of the responsibilities as a riparian owner as well as the residents on Alandale.</p> <p>Now the works to the school have been undertaken the Council has been made aware of work potentially blocking the ditch and the location can be identified at 1a Alandale by a tenant, which will require further investigation.</p> <p>The Council were notified of further properties flooded opposite Dale Close by the Environment Agency report shared with the Council in May 2017, to which the Council have sought to incorporate the findings and interview these residents as well to determine those affected.</p>
Residents	To be completed	<p>To undertake their riparian responsibilities in conjunction with each other and the school.</p> <p>To also implement flood protection products to prevent water ingress.</p>
Action by Thames Water		<p>Thames Water have stated that this flooding has not been reported to them and therefore no action has been taken.</p>

Area affected		7) Sutton Court Road, Uxbridge UB10 9H	
Date of flooding		23/06/2016	
Grid Reference		X 507847 Y 183546	
Land ownership		Abbotsfield and Swakeleys School, LBH open space and private road and residents	
Map of Area		Photo	
Location of flooding marked as a red star		Photograph provided by resident	
			
Flooding duration		Evening of the 23rd June. Not known exactly	
Source of flooding		Surface water	
Cause/ Pathway		Heavy rain not absorbed within the school playing fields flowed towards the low lying green space and ponded there. This built up until it spilled across to the adjacent private road and spilled across into residents rear gardens homes.	
Impact of flooding		Flooded internally	3
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	4
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	Yes
History of flooding		Gardens flooded previously 14/11/2014 and 09/01/2015, 18/04/2016	
Summary		After a short intense period of rainfall, lasting for approximately an hour, water flowed down the school fields into residents homes.	
London Borough of Hillingdon	Actions completed	<p>The Local Planning Authority - The Council have reviewed the proposals for the redevelopment of the school to ensure that the redevelopment will reduce the surface water run off from the school site, through sustainable measures. Details contained within the planning application.</p> <p>The Council asked the developers to provide a bund to protect residents during the construction phase and continue to monitor works as they progress.</p>	
Residents	To be completed	The road to the rear of properties is privately owned and therefore landowner is responsible for maintaining any drainage and installing any needed.	
Action by School		School to maintain the drainage regularly within the site.	

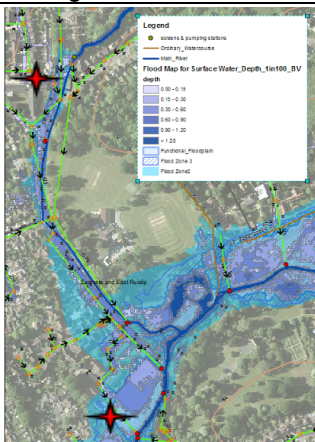

Area affected		8) Field End Road - Eastcote High Street, (also includes Hawthorne Avenue) Eastcote HA5 1R	
Date of flooding		23/06/2016	
Grid Reference		X 511065 Y 187746	
Land ownership		Commercial premises and Adopted Highway	
Map of Area		Photo	
Location of flooding marked as a red star		Photograph taken from social media	
			
Flooding duration		Evening of the 23rd June not known exactly.	
Source of flooding		Surface water	
Cause/ Pathway		Overwhelming of surface water sewer by heavy rain.	
Impact of flooding	Flooded internally		3
	Flooded under floorboards		2
	Affected (ie gardens and front drive/garages)		0
Evidence	Reports from residents and social media		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding		Previously on the 26th August 2015, and then 8th June 2016 http://www.getwestlondon.co.uk/news/west-london-news/north-harrow-station-closed-due-11446744 and subsequently on the 15th September - http://www.standard.co.uk/news/london/london-weather-flooding-after-met-office-thunderstorm-alert-a3346156.html	
Summary		After a short intense period of rainfall, the surface water sewers were overwhelmed causing roads to flood. https://www.youtube.com/watch?v=zv9WouMN-t8	
London Borough of Hillingdon	Actions completed	The Highways service in addition to the annual clearing, have checked and cleared gullies in September. Gullies on Field End Road and Eastcote High Street will be maintained more frequently as an area of higher priority. The 'non property flooding' events of the 23rd June were reported to Thames Water by the Council who investigated it.	
	To be	The Highways projects team were considering potential works in the area, it was recommended that this project extended to include options to alleviate	

	completed	flooding. Feasibility, options and costings are being explored by the Highways Transportation and Projects team.
Residents	To be completed	The Council recommends considering installing flood protection measures such as flood proof doors. Further information can be found on the Hillingdon website.
Action by Thames Water		<p>Thames Water is responsible for the surface water sewers that the gullies drain into. There are two which run in different directions.</p> <p>Flooding was reported to Thames Water for 23rd June by the Council in September. The surface water sewer line was checked and found to be free flowing.</p> <p>Flooding was reported to Thames Water on the 9th June and the sewer questionnaire was filled in. A blockage on the sewer was found and cleared.</p> <p>Furthermore, it was identified as part of Thames Water's investigation that one of the sewers drain to a ditch within London Underground land, to the north of the station but south of the Council car park. This is a London Underground asset and Thames Water made London Underground aware.</p>
Action by London Underground		The Council have made a request to London Underground to provide information on the action they have taken following Thames Water's investigation findings. ie Assess the state of any drainage assets provide information on where water flows to. No response has been provided to date.

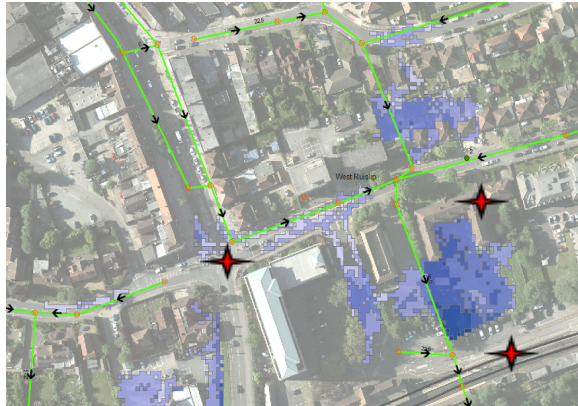
Area affected		9) Hilliard Road, Hallowell Road, Church Road and Northwood High Street, Northwood HA6 1	
Date of flooding		23/06/2016	
Grid Reference		X 509820 Y 190795 & X 509566 Y 190893 & X 509880 Y 191243	
Land ownership		Resident and LBH (St James Court)	
Map of Area		Photo	
Location of flooding marked as a red star		Photograph provided by resident	
			
Flooding duration		Evening	
Source of flooding		Surface water	
Cause/ Pathway		Overwhelming of drainage system by heavy rain, water built up on the road and along private access track	
Impact of flooding		Flooded internally	3
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	3
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		2006 approximately and another event previous to that.	
Summary		After a short intense period of rainfall, lasting for approximately an hour, the surface water sewers were overwhelmed causing the roads to flood.	
London Borough of Hillingdon	Actions completed	<p>Highways maintenance - In addition to the normal maintenance programme the gullies were checked again after the event in July as requested by resident. Gullies will be maintained more frequently as an area of higher priority.</p> <p>The Council Housing service - responded to the immediate flooding.</p> <p>The Flood and Water Management Officer provided advice on roles and responsibilities to residents, and how to protect their homes.</p>	
Residents	To be completed	The Council recommend residents draw up a personal Flood Plan, and purchase products that can be purchased to protect homes from flooding through airbricks. Further information can be found on the Hillingdon website. Further recommendations on resident at Hilliard Road were made of a retaining wall at the edge of the rear garden to prevent water from the private access from entering the garden.	

**Action by Thames
Water**



These locations are not on the sewer flooding register but residents have called Thames Water to make them aware of the issues. The Council is unaware what, if any, action has been taken at this location.

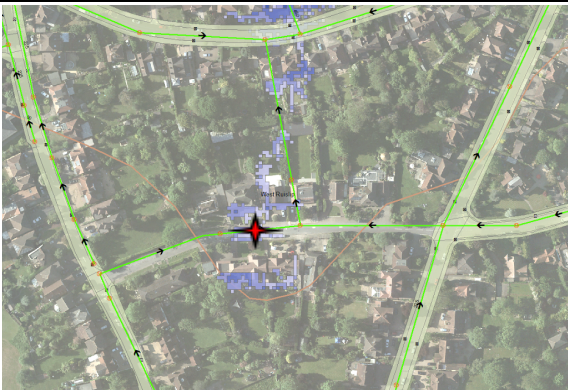
Area affected		10) Kaduna Close and Joel Street, Northwood HA5 2P	
Date of flooding		23/06/2016	
Grid Reference		X 510499 Y 188744	
Land ownership		Resident and Adopted Highway	
Map of Area		Photo	
Location of flooding marked as a red star		Photo from Tennis Club	
			
Flooding duration		From 17:30 until the following morning	
Source of flooding		Main river - Joel Street Ditch	
Cause/ Pathway		Caused by rising water levels of the Joel Street Ditch, overflowed and ran down the road towards the River Pinn and into Kaduna Close and across the Tennis Courts and into the River Pinn	
Impact of flooding		Flooded internally	3
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	3
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	3/3b
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		Joel Street Ditch has previously spilled onto the road.	
Summary		After a short intense period of rainfall, the Joel Street ditch rose in level overflowing onto Joel Street. Water flowed down the road towards the junction of Joel street and High Road Eastcote. Water built up in Kaduna close and overflowed into the Tennis Club	
London Borough of Hillingdon	Actions completed	Highways Service -In addition to the normal programme of gully clearance the gullies were checked following the flooding to remove any silt and debris that may have been washed in. This was done on the 7th October.	
Residents	To be completed	The Council recommend residents draw up a personal Flood Plan. Further information can be found on the Hillingdon website. Also on products that can be purchased to protect homes from flooding through airbricks.	
Action by Thames Water		It can be assumed that this is a separate sewer however this cannot be confirmed without a survey having been taken.	
Action by the Environment Agency		To lead on issues arising from this event, and investigate options and include them in the River Pinn flood alleviation scheme options review.	

Area affected		11) Church Road, Cowley, Uxbridge UB8 3N	
Date of flooding		23/06/2016	
Grid Reference		X 506220 Y 182064	
Land ownership		Resident and LBH Parks & Open Spaces, and Brunel University	
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident showing front of property	
Flooding duration		Unknown	
Source of flooding		Ordinary watercourse	
Cause/ Pathway		Overwhelming of a ditch by heavy rain. This ditch is fed by a pipe from the school which discharges through an outfall next to the access to Wyevale Garden Centre on Brunel University land. The ditch then flow through Hillingdon land and drains through a 6" pipe into the River Pinn across private land.	
Impact of flooding		Flooded internally	2
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	3b
		Critical Drainage Area (identified in the Surface Water Management Plan)	No
History of flooding		None known	
Summary		The ditch along the common land became full due to the amount of rain, and was not able to drain into the River Pinn causing water to back up along the ditch and flood the surrounding land including these properties.	
London Borough of Hillingdon		Actions completed	<p>The Flood and Water Management Officer - has investigated the event and the drainage system and made the teams responsible for the Council land here aware of the issues.</p> <p>The residents have been made aware of their responsibility for the pipe across their land, and recommendations were made to implement flood protection products to prevent water ingress from this ditch or the River Pinn</p> <p>The Green Spaces service have also undertaken additional maintenance to ensure the ditch is clear and created a flow path across Council land to create more space for water and allow water building up to flow across a part of the garden into the river away from the properties.</p>
Residents	To be completed	The residents are now aware of their responsibility for the pipe, and maintain flow path, as well as implement flood protection products.	

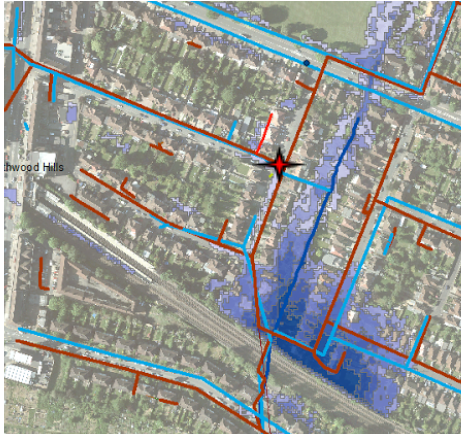

Area affected		12) Pembroke Road, and Ruislip High Street Ruislip HA4 8N	
Date of flooding		23/06/2016	
Grid Reference		X 509544 Y 187147	
Land ownership		Resident and LBH adopted highway	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		The surface water sewer could not cope with the amount of rainfall that fell. The road and subsequently the properties became flooded and a surface water manhole became dislodged.	
Impact of flooding		Flooded internally	4
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	1
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan)	No
History of flooding		28th July 2014, 26th August 2015, 16th September 2016 and multiple other reports of the road having ponding water.	
Summary		The short intense rainfall event caused the road to become flooded as the sewers could not cope with the amount of surface water. Water from the road then flooded the adjacent properties, including Fanuc House and spilling across into Central House .	
London Borough of Hillingdon	Actions completed	The gullies were checked in addition to the normal annual clearance on 23/06/2016 and were found to be clear and running. Gullies will be maintained more frequently by the Council Highways service as an area of higher priority.	
Residents	Actions completed	Residents reported to Thames Water that the sewers may be blocked or have defective pipework as there is always a puddle of water at a specific location and even more so after heavy rainfall. Some residents have installed flood protection measures such as air brick covers.	
Action by Thames Water		Extensive surveys and cleaning have been carried out along this road with silt/debris/rubble being removed from various locations. Silt and loose concrete	



	<p>have been removed from the surface water sewer. They have also cut root intrusion into the pipes.</p> <p>Residents have reported that Thames Water had been investigating the foul water sewers since 2014 with CCTV equipment. After this flood they found that it was the surface water sewer that was the issue on 23/06/2016.</p> <p>The Thames Water Sewer Flooding Questionnaire has been completed and submitted for flooding that occurred in September 2016.</p>
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Area affected		13) Eastcote Road, Eastcote HA4 8D	
Date of flooding		23/06/2016	
Grid Reference		X 509253 Y 187612	
Land ownership		LBH Green Space, private resident	
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		Surface water from the tennis courts flowed into the garden of one property. At another location surface water from the school playing field ran into the gardens of some properties.	
Impact of flooding		Flooded internally	2
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	3
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		Residents has advised of previous flooding but not provided details	
Summary		A short intense rain event caused surface water to flow from areas behind these properties, tennis court and school field, into the gardens and two houses of these properties.	
London Borough of Hillingdon	Actions completed	The Council investigated and provided advice to residents, no new hard surfacing had been put in place. The tennis courts are porous and provide substantial more space for water to be absorbed than an otherwise urban environment, however most green space was saturated.	
Residents	Actions completed	None known	

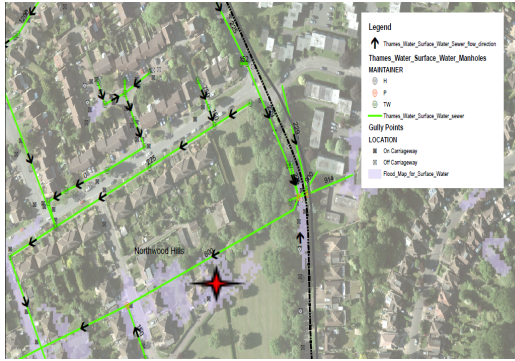

Area affected		14) King Edward's Road, Ruislip HA4 7A	
Date of flooding		23/06/2016	
Grid Reference		X 508836 Y 187359	
Land ownership		None	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Approximately 1 hour	
Source of flooding		Surface water	
Cause/ Pathway		Water flowed down the King Edwards Road from both ends Sharps Lane to the west and Church Road to the east to the lowest point of the road and built up spilling over to front gardens.	
Impact of flooding	Flooded internally		2
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		1
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding		None recorded	
Summary		The centre of King Edwards Road is low lying area susceptible to buildup of water.	
London Borough of Hillingdon	Actions completed	The Council have investigated the flooding and this is a non adopted road, and have advised residents that it is the residents responsibility to maintain. It has also been identified that these drains flow into a Thames Water sewer which runs along the road and then north.	
Residents	Actions completed	The drains are cleared by a private company once every year.	
	To be completed	It is recommended that residents also report the issues to Thames Water so that is on their register. Residents should consider flood protection products to prevent water ingress.	
Thames Water		Not aware of any reports of flooding.	

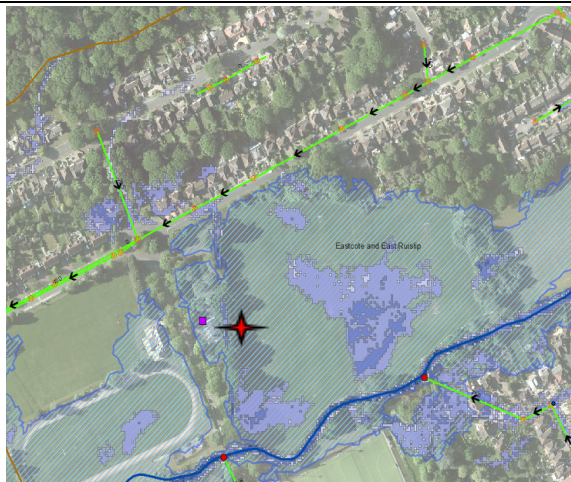

7.2. Single reports of flooding

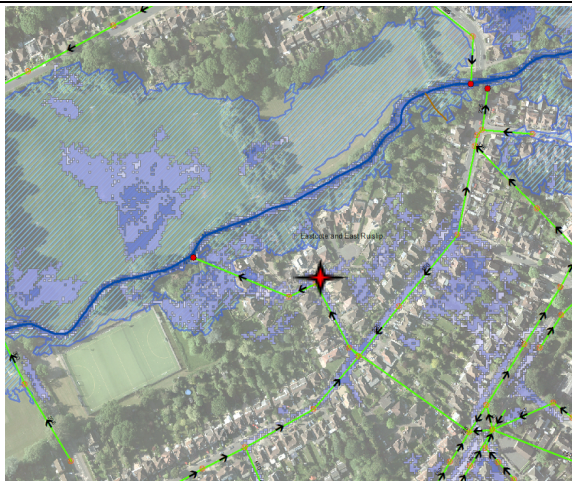

Area affected		15) Briarwood Drive, Northwood HA6 1P	
Date of flooding		23/06/2016	
Grid Reference		X 510493 Y 190293	
Land ownership		LBH adopted highway	
Map of Area		Photo	
Location of flooding marked as a red star		Snapshot of video provided by resident	
			
Flooding duration		Evening approximately 1 hour	
Source of flooding		Foul sewer	
Cause/ Pathway		Inundation of foul water sewer by extreme amount of heavy rain.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	2
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		Flooded previously in 2014, and four times this year (2016).	
Summary		A severe amount of heavy rain fell in a short period of time, overwhelming the surface water and foul water sewers in the area, flooding some people's back gardens.	
London Borough of Hillingdon	Actions completed	The Council recommend residents draw up a Flood Plan. Further information can be found on the Hillingdon website. Also on products that can be purchased to protect homes from flooding through airbricks.	
Residents	To be completed	It is recommended that residents report the issue to Thames Water and fill in the sewer flooding questionnaire.	
Action by Thames Water		A property reported a bad smell two days after this event and this was due to concrete in the foul sewer line, which was cleared out. Sewer flooding is not on the Thames Water register at this location.	

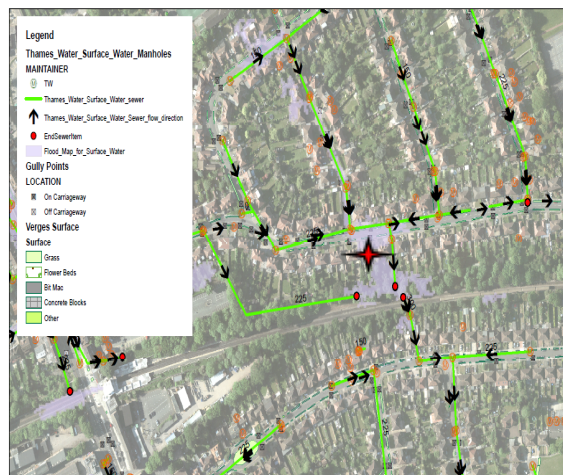

Area affected		16) Chestnut Avenue, Northwood, Hillingdon, HA6 1H	
Date of flooding		23/06/2016	
Grid Reference		X 509614 Y 190434	
Land ownership		Resident and LBH Parks & Open Spaces.	
Map of Area		Photo	
Location of flooding marked as a red star		Photo by resident of front lounge	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		The gullies on the road draining to the public surface water sewers were overwhelmed by the heavy rainfall.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	1
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		On 15th September 2016 sandbags were needed to prevent a property from being flooded.	
Summary		Surface water ran down Chestnut Avenue overwhelming the drainage system.	
London Borough of Hillingdon	Actions completed	<p>Highways Service -Gullies on Chestnut Avenue are checked as part of the normal annual maintenance and also cleared on 29/06/2016 following reports. Gullies will be maintained more frequently as an area of higher priority.</p> <p>Green Spaces Services manage the Cemetery. The drains in the cemetery were also checked by the Green Spaces Service, and were clear.</p> <p>Residents were provided with advice to also report the issue to Thames Water to ensure they checked their part of the drainage system for blockages.</p> <p>In addition the ditch that the sewers flow into has been checked and is clear.</p>	
Residents	To be completed	It is recommended that residents report the issue to Thames Water and fill in the sewer flooding questionnaire.	
Action by Thames Water		The site is not on the Thames Water Sewer Flooding Database. The site was visited on 29 June and the surface water sewers checked. They were all free flowing. The site was visited again on 11 October 2016 and the surface water sewers checked. They were all free flowing. Silted gullies were identified again as well as some of the private catch pits that needed clearing.	

Area affected		17) Hillside Road, Northwood HA6 1P	
Date of flooding		23/06/2016	
Grid Reference		X 510617 Y 191043	
Land ownership		School and resident and LBH adopted Highway	
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident	
			
Flooding duration		Unknown	
Source of flooding		Ordinary watercourse and surface water	
Cause/ Pathway		Water from a spring above Potter Street Hill and heavy rainfall spills from ordinary watercourse, across school ground towards the rear of properties along Hillside Road. There is a raised embankment here where water builds up until it flows over to properties at a lower level. It then flows on to Hillside road and over to the south side of the road where properties are lower again.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	5
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan)	No
History of flooding		Exact date unknown	
Summary		Surface water also washed gravel from a driveway into a gully causing it to become blocked. Water built up on the road. Water then went under one of the houses and into a garden of another.	
London Borough of Hillingdon	Actions completed	Highways Service - has cleared gravel from the gullies on Hillside Road. The Council has also heard the petition from residents on the flooding and the proposed highway street calming in June, and amended proposals.	
Residents	Actions completed	The residents have petitioned the Council to install chicanes rather than speed tables as part of the proposed traffic calming measures. As an ordinary watercourse and not defined as a sewer the residents under which the culvert lies, may then be responsible as a riparian owner for the culvert in their private land.	
Action by St John's School		The school manage the debris screen at the entrance to the culvert going underneath residential properties.	

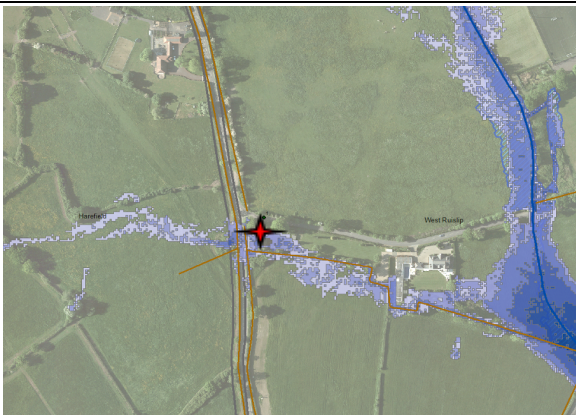
Area affected		18) Cuckoo Hill and Raisins Hill, Pinner HA5 2	
Date of flooding		23/06/2016	
Grid Reference		X 511106 Y 189657	
Land ownership		LBH and Resident	
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident	
			
Flooding duration		18:00 - 00:00 midnight approximately	
Source of flooding		Surface water sewer	
Cause/ Pathway		Water built up on the road as a result of heavy rain, cars passing down the road, water splashed over the kerb causing water to flow across Cuckoo Hill open space and then on to the Raisins Hill Road, and into property	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan)	No
History of flooding		None	
Summary		After a short intense period of rainfall, water overwhelmed the drainage system	
London Borough of Hillingdon Actions completed		<p>Highways Services - In addition to the normal maintenance the Council checked and cleared the 22 gullies along Cuckoo Hill on the 28th July 2016.</p> <p>Green Spaces Service have looked at options that water may be held back within the open space, and have created a small bund to hold some water back in the park.</p> <p>Flood and Water Management Officer has also met with and advised residents on action that they can take, such as getting flood proof doors.</p> <p>Thames Water sewers information obtained from Thames Water in 2017 are shown on the map above. They have now provided feedback to this report which state they believe there are no sewers. The Flood and Water management officer is raising this with Thames Water.</p>	
Residents	To be completed	The Council advised residents on the products that can be purchased to protect homes from flooding such as flood proof doors.	
Action by Thames Water		Thames Water are now stating that their public sewer records do not show any sewers in Cuckoo Hill Road or Raisins Hill.	

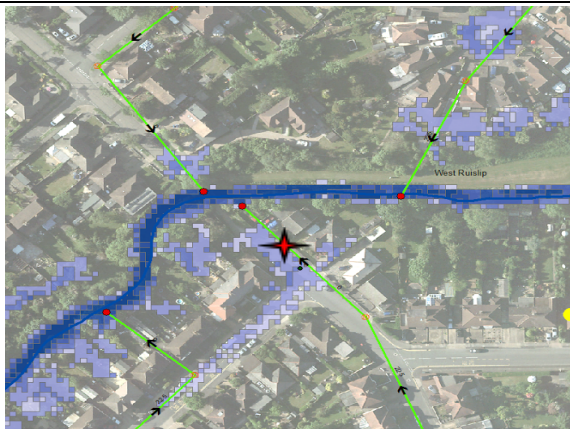
Area affected		19) Kings College Road, Ruislip HA4 7J	
Date of flooding		23/06/2016	
Grid Reference		X 509610 Y 188261	
Land ownership		LBH and Resident	
Map of Area		Photo	
Location of flooding marked as a red star		Photo taken from social media @eastcotehc https://twitter.com/eastcotehc/status/746094512477474816	
			
Flooding duration		Unknown	
Source of flooding		Main river	
Cause/ Pathway		Flooding from the River Pinn in response to heavy rain	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	No
		Identified on the flood map for surface water	No
		Identified at risk of flooding from rivers and the sea (Flood Zone)	3b
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		None reported specifically but shown to be within the 1977 flood extent recorded by the Environment Agency.	
Summary		Heavy rain caused the river to rise and spill over into the floodplain affecting the site.	
London Borough of Hillingdon	Actions completed	No report from the club	
Action by Hockey Club	Actions completed	Replaced flooring	



Area affected		20) Meadow Close, Ruislip HA4 8A	
Date of flooding		23/06/2016	
Grid Reference		X 509892 Y 188186	
Land ownership		LBH Green Space, private resident and LBH adopted highway	
Map of Area		Photo	
Location of flooding marked as a red star		Provided by resident	
			
Flooding duration		17:00 - 01:00 approximately	
Source of flooding		River Pinn and Sewers	
Cause/ Pathway		Overtopping of the river restricting the ability of the surface water sewers to discharge.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	1
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	3
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		None reported.	
Summary		After a short intense period of rainfall, the river levels had risen and caused flooding to the property internally.	
London Borough of Hillingdon	Actions completed	The gully's on the road are maintained annually to clear them of debris	
Residents	Actions completed	Residents have got air bricks which automatically close.	

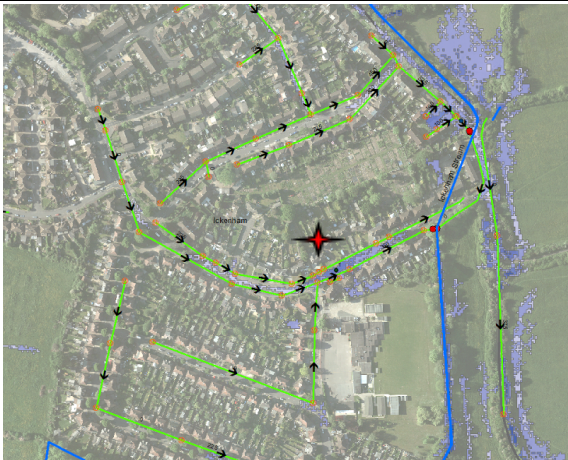
Area affected	21) North View, Eastcote, Hillingdon, HA5 1		
Date of flooding	23/06/2016		
Grid Reference	X 511484 Y 187756		
Land ownership	Resident and TfL - London Underground		
Map of Area		Photo	
Location of flooding marked as a red star		Provided by resident	
			
Flooding duration	17:30 - 18:30		
Source of flooding	Heavy rain overwhelming the drainage network, gullies, sewer and ordinary watercourse		
Cause/ Pathway	Water built up on the roads, spilling over to front gardens and garages		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		1
	Affected (ie gardens and front drive/garages)		1
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding	According to residents flooded in 2014 and 2015, and 8th Feb 2016, 8th June 2016 as well as subsequently on Sept 15th 2016		
Summary	Regular flooding in heavy rain.		
London Borough of Hillingdon	Actions completed	Flood and Water Management Officer - The Council had investigated following reports of flooding in 2015 by the residents. It was noted that the sewers flow into the London Underground drainage network before flowing back into Thames Water sewers. A request was made to LU in 2015 to get the drainage system checked. The Council also again requested action from Thames Water and LU. Sewer performance issues were identified and corrected by London Underground. Residents were also advised to contact Thames Water to report the flooding. Highways Service - The Council in addition to their annual maintenance checked the gullies again after the event. Gullies will be maintained more frequently as an area of higher priority.	

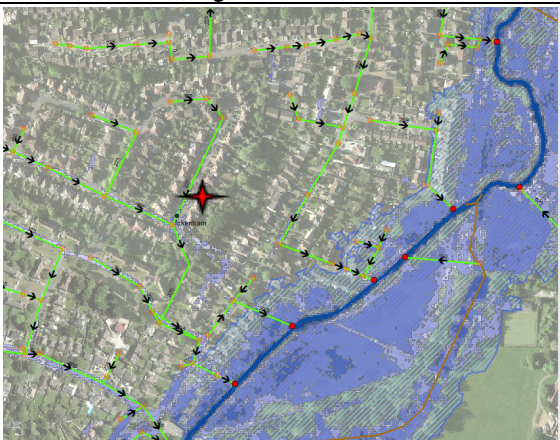
		Residents concerned that the road camber slopes towards the properties and across the dropped kerb into driveways, and requesting additional gullies have been passed to the Highways Service to investigate and programme in any works considered appropriate.
	To be completed	The Highways Service are relaying the footpath to create a water check to ensure water is guided to the gully.
Residents	To be completed	The Council recommend residents draw up a Flood Plan. Further information can be found on the Hillingdon website, on products that can be purchased to protect homes from flooding through using airbricks. Anything of value should be stored above the ground in garages.
Action by Thames Water		Residents have reported flooding to Thames Water on previous occasions in February 2016. Thames Water identified debris in the sewer, which would need a sewer repair that would take in excess of 3 months due to permitting restrictions on non-emergency work. Resident in June advised that Thames Water had said they would be undertaking works in 6 weeks. Thames Water attended site in August, and replaced a section of pipe outside no 74.
Action by London Underground		The request was made by the Council to London Underground in October 2015 to check and clear the culvert identified as PC228. London Underground attended the site in August 2016 and found the culvert partially blocked and removed the debris at that time. They have confirmed that this is cleared on a yearly basis. Their information was considered confidential and specified it could not be published. For queries to LU Contactus@tfl.gov.uk or 0343 222 1234



Area affected	22) Fine Bush Lane, Harefield UB9 6L		
Date of flooding	23/06/2016		
Grid Reference	X 510691 Y 190547		
Land ownership	Resident		
Map of Area			Photo
Location of flooding marked as a red star		None	
			
Flooding duration	Unknown		
Source of flooding	Ordinary watercourse		
Cause/ Pathway	A large amount of rain fell in a short time period		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		0
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding	None reported		
Summary	One property was flooded internally due to the large amount of rain that fell		
London Borough of Hillingdon	Actions completed		
Residents	Actions completed	Unknown	
Action by Thames Water	There is no sewer network mapped in this location		


Area affected		23) Westcote Rise, Ruislip HA4 7L	
Date of flooding		23/06/2016	
Grid Reference		X 508361 Y 187751	
Land ownership		LBH Adopted Highway and private resident	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Unknown	
Source of flooding		Watercourse restricting discharge from the public surface water sewer	
Cause/ Pathway		The surface water sewers could not discharge into the watercourse as the level rose	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	9
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	2/3/3b
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		None reported	
Summary		The short intense period of rain overwhelmed the surface water sewers. Surface water couldn't drain away causing the road to flood and subsequently internal flooding to the property	
London Borough of Hillingdon	Actions completed	The gullies were cleared after the event by the Council's Highways Service in addition to the normal annual maintenance programme and found to be running. Gullies will be maintained more frequently as an area of higher priority.	
Residents	Actions completed	None known	

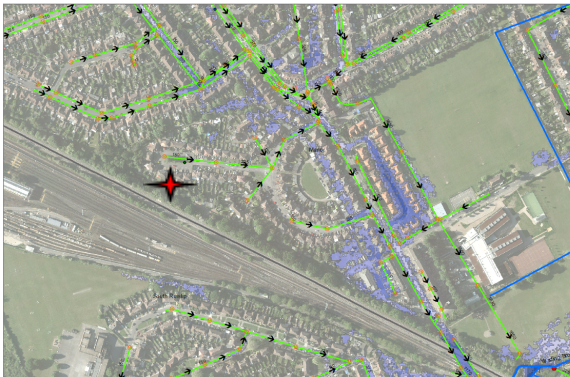
Area affected	24) Sharps Lane, Ruislip HA4 7J		
Date of flooding	23/06/2016		
Grid Reference	X 508841 Y 187568		
Land ownership	Resident and LBH adopted highway		
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident	
			
Flooding duration	Four hours		
Source of flooding	Rainfall entering the foul sewer		
Cause/ Pathway	Overwhelming of foul water sewer by extreme amount of heavy rain		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		1
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding	2014 and 2015		
Summary	Heavy rainfall caused the surface water and foul sewers in the road to become overwhelmed causing the properties to become flooded. Water entered one of the properties while others had their front drives and foundations affected		
London Borough of Hillingdon	Actions completed	The Council recommended residents take action to protect their home by using products such as air brick covers	
Residents	Actions completed	The flooding has been reported to Thames Water by the residents. The flooding of 2015 was also reported to and investigated by Thames Water	
Action by Thames Water	Residents have said they have reported the issues to Thames Water but a Sewer Flooding Questionnaire has not been filled in		

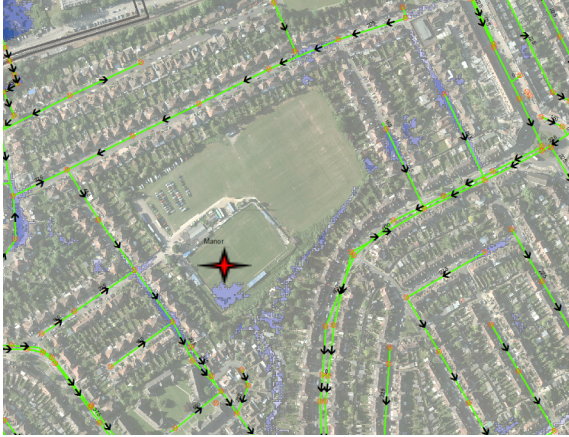

Area affected	25) Glebe Avenue, Ickenham UB10 8P		
Date of flooding	23/06/2016		
Grid Reference	X 508486 Y 185686		
Land ownership	Resident and LBH adopted highway		
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration	Afternoon		
Source of flooding	Surface water and Ickenham Stream		
Cause/ Pathway	Surface water sewer outfalls were drowned by high levels in the Ickenham Stream Main River		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		4
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding	28/07/2014		
Summary	Residents worked together to help push the water down the road toward gullies and away from homes		
London Borough of Hillingdon	Actions completed	The ditch has been cleared after the previous incident of flooding. The gulleys on the road are maintained annually by the Highways Service and have been prioritised to be undertaken more frequently in this area.	
Residents	Actions completed	The residents have written to Thames Water to report the flooding and requesting that the drainage systems and capacity be investigated	
Action by Thames Water	Thames Water cleared the scale found on the foul water sewers and investigated using CCTV subsequent to the event on 25/07/2016. No major defects were found in the line. The rainfall return period at this location was a 1 in 35 year event		


Area affected		26) Campden Road, Ickenham UB10 8E	
Date of flooding		23/06/2016	
Grid Reference		X 506959 Y 185957	
Land ownership		Private	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Unknown	
Source of flooding		Surface water sewer flooding	
Cause/ Pathway		The surface water sewers could not cope with the large amount of rain that fell causing the drains to become backed up flowing from a manhole in conservatory	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		None reported	
Summary		The conservatory of the property was flooded as water was bubbling up from the manhole located here	
London Borough of Hillingdon	Actions completed	The gulleys on the road are maintained annually by the Highways Service	
Residents	Actions completed	Unknown	
Action by Thames Water		Thames Water has replaced a manhole cover in April 2016.	


Area affected		27) Harefield Road, Uxbridge UB8 1P	
Date of flooding		23/06/2016	
Grid Reference		X 505690 Y 185033	
Land ownership		LBH Adopted Highway and private resident	
Map of Area		Photo	
Location of flooding marked as a red star		Photo provided by resident	
			
Flooding duration		Evening	
Source of flooding		Surface water	
Cause/ Pathway		There was a short intense period of rainfall. The surface water built up on the road spilling over into the adjacent front garden.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		September 2015. Surface water pools in front of the property	
Summary		The surface water built up on the road	
London Borough of Hillingdon	Actions completed	The gullies were checked and no defects were found. There are 3 gullies in a short stretch which can be seen in the photo in order to ensure water can enter the Thames Water sewer. Gullies will be maintained more frequently by the Council Highways Service as an area of higher priority	
Residents	Actions completed	The residents have raised their drive and made it permeable	
Action by Thames Water		This is recorded on the Thames Water Flooding database. On investigation a large blockage was found and cleared on 05/09/2016. The flooding can solely be attributed to the blockage. The location has previously benefitted from a Thames Water funded alleviation scheme. The scheme is a pumped return flood storage tank which has been found to be in working order	

Area affected		28) Southbourne Gardens Ruislip HA4 9T	
Date of flooding		23/06/2016	
Grid Reference		X 511053 Y 187294	
Land ownership		Resident	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		A short intense period of rain caused the surface water sewers to become overwhelmed. Water came down the driveway towards the the property. Water was coming up from underneath the floor	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	9
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		None reported	
Summary		Surface water couldn't drain from the road into the sewers causing the road and then the property to become flooded	
London Borough of Hillingdon	Actions completed	The gulleys on the road are maintained by the Council annually. Gullies will be maintained more frequently as an area of higher priority	
Residents	Actions completed	Residents closed the road for 2 hours. The report of flooding has been made to Thames Water	
Action by Thames Water		Following on from the reported flooding it was identified that a private sewer was silted up, most likely from the recent flooding. This was cleared	

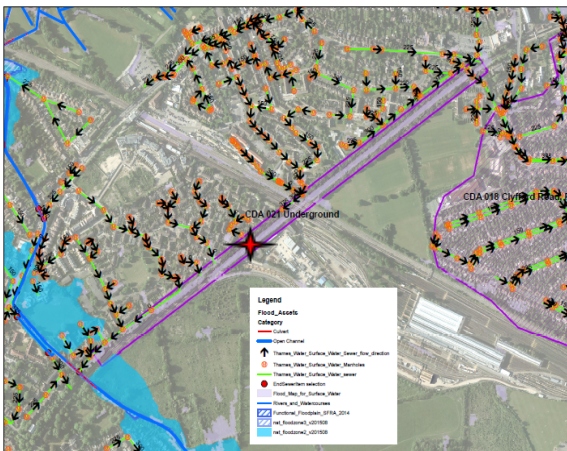
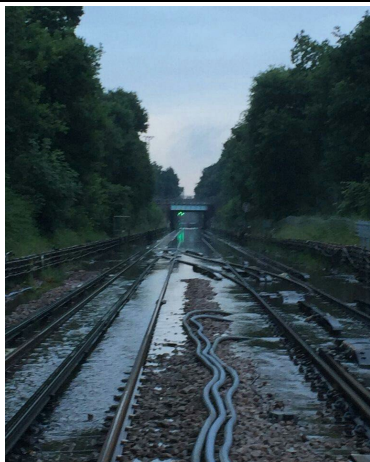
Area affected	29) Lawn Close, Ruislip HA4 6E		
Date of flooding	23/06/2016		
Grid Reference	X 509728 Y 186213		
Land ownership	National Rail and Private landowners rear access		
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration	Unknown		
Source of flooding	Ordinary watercourse		
Cause/ Pathway	Ordinary Watercourse overflowing on Network Rail land		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		0
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		Yes
History of flooding	None reported		
Summary	Flooding came from the rear of the property		
London Borough of Hillingdon	Actions completed	The Council provided the residents with the information on the landowner as it was known to the Council	
Residents	Actions completed	None known	
Network Rail	Action completed	None known	

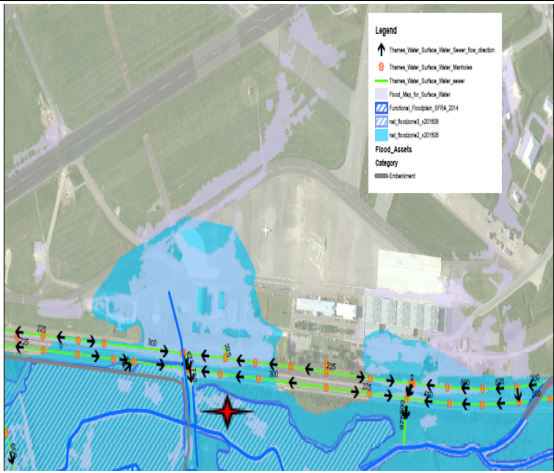

Area affected		30) Grosvenor Vale, Ruislip HA4 6J	
Date of flooding		23/06/2016	
Grid Reference		X 509709 Y 186782	
Land ownership		Private	
Map of Area		Photo	
Location of flooding marked as a red star		Photo taken from social media	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		A large amount of rain fell in a short period of time	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	No
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	Yes
History of flooding		None reported	
Summary		The football pitch was flooded after a large amount of rain fell.	
London Borough of Hillingdon	Actions completed	No direct reports to the Council. No specific work planned other than the normal maintenance to gullies in the area	
Residents	Actions completed	None known	

Area affected		31) Westfield Way at junction Beechwood Avenue, Ruislip, Hillingdon HA4 6H	
Date of flooding		23/06/2016	
Grid Reference		X 509629 Y 186482	
Land ownership		Resident and LBH adopted Highway	
Map of Area		Photo	
Location of flooding marked as a red star		None	
			
Flooding duration		Unknown	
Source of flooding		Surface water	
Cause/ Pathway		Overwhelming of the surface water sewer	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		28th July 2014	
Summary		Heavy rain caused the sewers to become overwhelmed	
London Borough of Hillingdon	Actions completed	The Council have provided advice to the resident to incorporate flood protection measures. The Council has requested that Thames Water investigate the whole length of surface water sewer to the point of discharge into a river so that it can be confirmed that the system functions appropriately. They have stated that this is an excessive distance to request to be investigated with high expense and that sufficient investigation has been carried out through integrity investigations within the area and no further action is proposed.	
Residents	Actions completed	None known	
Action by Thames Water		Sewer integrity was assessed for the properties that reported the flooding. No defects were found.	

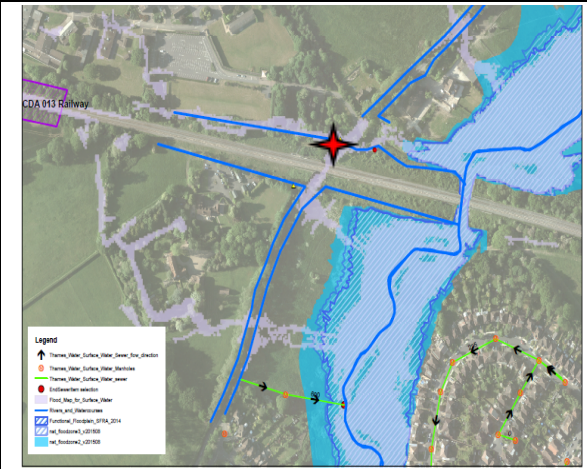

Area affected	32) Bury Avenue, Hayes UB4 8L		
Date of flooding	23/06/2016		
Grid Reference	X 509075 Y 183213		
Land ownership	London Borough of Hillingdon		
Map of Ar	Photo		
Location of flooding marked as a red star		None	
			
Flooding duration	Unknown		
Source of flooding	Surface water		
Cause/ Pathway	A large amount of rain fell in a short period causing the sewers to become overwhelmed		
Impact of flooding	Flooded internally		1
	Flooded under floorboards		0
	Affected (ie gardens and front drive/garages)		0
Evidence	Reports from residents		Yes
	Identified on the flood map for surface water		Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)		No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)		No
History of flooding	None reported		
Summary	The sewers became overwhelmed causing the property to become flooded		
London Borough of Hillingdon	Actions completed	The gully's within the car park have been cleared by the Council Highways Service subsequent to the event. Gullies will be maintained more frequently as an area of higher priority	
Residents	Actions completed	None known	
Action by Thames Water	This location was not reported to Thames Water and so no action has been taken		

7.3. Infrastructure


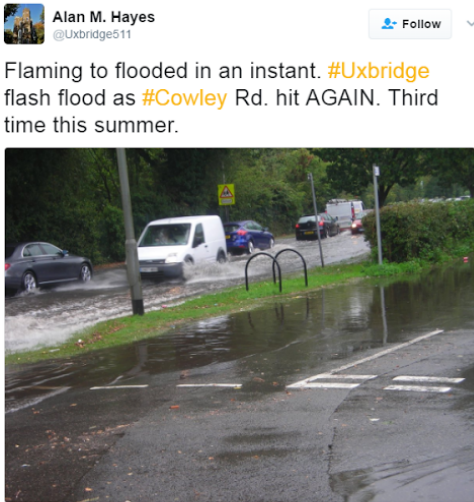
Area affected		a) Metropolitan Line near Ruislip Station, Ruislip HA4	
Date of flooding		23/06/2016	
Grid Reference		Exact reference unknown	
Land ownership		TFL - London Underground	
Map of Area		Photo	
Location of flooding marked as a red star		Photographs taken from LU@metline social media https://twitter.com/metline/status/746071091341303808	
			
Flooding duration		Morning and evening	
Source of flooding		Surface water	
Cause/ Pathway		Overwhelming of surface water sewer by very heavy rain	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in Surface Water Management Plan)	Yes
History of flooding		28th July 2014 also tweeted by @metline	
Summary		Closure of the Metropolitan Line for a number of hours in the morning and evening as flooding across the railway line near Ruislip that is unable to drain away, requiring pumping, stopping trains running from Rayners Lane to Uxbridge. After a short and intense period of rainfall, the drainage away from the tracks was overwhelmed.	
London Borough of Hillingdon	Actions completed	Flood and Water Management Officer - Requested information on action being taken by London Underground on this stretch to avoid flooding in the future. Also initiated project with the GLA to investigate the resilience significant infrastructure in the Borough. However no information provided by London Underground on their drainage network.	
London Underground	To be completed	Investigate and determine appropriate actions and share discuss with the Council as the Lead local Flood Authority. No feedback provided at this time.	

Area affected	b) A40 Northolt, Ruislip HA4	
Date of flooding	23/06/2016	
Grid Reference	X 509245 Y 184509	
Land ownership	TfL as Highway Authority	
Map of Area	Photo	
Location of flooding marked as a red star	Photograph taken from social media/resident	
		
Flooding duration	From 18:00 pm until 02:30am 24th June	
Source of flooding	Surface water	
Cause/ Pathway	To be investigated further, initial findings appear that the gullies and then surface water sewer were overwhelmed by very heavy rain and not able to freely discharge as the Yeading Brook was at a high level	
Impact of flooding	Flooded internally	1
	Flooded under floorboards	0
	Affected (ie gardens and front drive/garages)	0
Evidence	Reports from residents	Yes
	Identified on the flood map for surface water	Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)	3b
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	Yes
History of flooding	A40 previously flooded in 2014 nearer to Hillingdon Underground Station. (16.6mm 8th June which affected other parts of Ruislip did not result in flooding here)	
Summary	<p>After a short and intense period of rainfall, the drainage on the A40, Thames Water surface water sewers and the Yeading Brook were overwhelmed causing flooding on the A40. Ownership of these pipes are under discussion with TfL as they are most likely highway drains and not surface water sewers.</p> <p>Flooding across the three lanes of the eastbound carriageway from the Hillingdon on slip A40, restricting access onto and past this area of the A40 causing traffic to build up.</p> <p>The Environment Agency issued a Flood Alert on the Yeading Brook on the 17th June which remained in place until the 23rd June. The nearest gauge was Northolt Gutteridge Wood, directly next to the location of flooding. The highest level was at 00:15 on the 24th which read 1.842 m</p>	

		(flooding is expected at 1.58m). Heavy rainfall of 11.8mm within an hour recorded at the RAF Northolt Gauge
London Borough of Hillingdon	To be completed	Investigate what action TfL and Thames Water and RAF Northolt are taking to alleviate flooding.
Transport for London	Actions completed	Following a request for information from the Council TfL have confirmed that contractors working on their behalf were there and required a number of tankers to take water away.
	To be completed	Investigate and determine appropriate actions and share discuss with the Council as the Lead local Flood Authority.
Environment Agency	To be completed	Review flood warning triggers and if Tfl are signed up to receive them in this area.

Area affected		c) Breakspear Road South, Ickenham UB10 8H	
Date of flooding		23/06/2016	
Grid Reference		X 507194 Y 187196	
Land ownership		Network Rail and LBH as adopted Highway	
Map of Area		Photo	
Location of flooding marked as a red star		Photographs taken by resident. Breakspear Road South	
			
Flooding duration		17:30 -19:30	
Source of flooding		Ordinary watercourses	
Cause/ Pathway		Overwhelming of ordinary watercourse and culverts under the road by extreme amount of heavy rain which flow into the River Pinn.	
Impact of flooding		Flooded internally	1
		Flooded under floorboards	0
		Affected (ie gardens and front drive/garages)	0
Evidence		Reports from residents	Yes
		Identified on the flood map for surface water	Yes
		Identified at risk of flooding from rivers and the sea (Flood Zone)	No
		Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding		Breakspear Road South has flooded many times in December 2012, 2013, 2014 and 2015, 11th January 2016. See previous Flood Investigation Dec 2013- June 2014	
Summary		A severe amount of heavy rain fell in a short period of time, overwhelming the ordinary watercourses and restricting access. Flood water flowed down roads, pooling at low points, underneath the railway bridge down Breakspear Road South. The water was up to the top of car wheels in some places	
London Borough of Hillingdon	Actions completed	Flood and Water Management Officer has had ongoing discussions and met with with Network Rail following previous flooding in 2013/2014. The Council continues to work with Network Rail to identify measures. The flood risk issues in this area have also been raised by the Council to Hs2, which will cross Breakspear Road South just to the north of this location.	

		The Council Highways Service is considering a number of options including maintaining the gullies more frequently as an area of higher priority, and also placing appropriate signage to make drivers aware of the risks of flooding.
Network Rail	To be completed	The ordinary watercourses causing the main issues lie on Network Rail land. They have taken some action since floods in 2013/2014 to reduce the risk following previous reports, including altering culvert alignment and rebuilding culvert entrance. However further work has been identified by the Council which was requested of Network Rail in 2016 including identifying condition of culvert along both sides of the road south of the embankment on Network Rail land, which is yet to be undertaken.

Area affected	d) Cowley Road, Uxbridge UB8 2	
Date of flooding	23/06/2016	
Grid Reference	X 505376 Y 183544	
Land ownership	Adopted Highway	
Map of Area	Photo	
Location of flooding marked as a red star	Photograph taken from Alan Hayes https://twitter.com/Uxbridge511 on social media	
		
Flooding duration	Unknown approximately 1 hr 17:30 to 18:30	
Source of flooding	Surface water sewer	
Cause/ Pathway	Heavy rain, overwhelming the road gullies and surface water sewer	
Impact of flooding	Flooded internally	1
	Flooded under floorboards	0
	Affected (ie gardens and front drive/garages)	0
Evidence	Reports from residents	Yes
	Identified on the flood map for surface water	Yes
	Identified at risk of flooding from rivers and the sea (Flood Zone)	No
	Critical Drainage Area (identified in the Surface Water Management Plan for Hillingdon)	No
History of flooding	Cowley Road has previously flooded in 2012, 28th July 2014 and 26th August 2015. 23rd June, and subsequently to this event in 12th July and 15th September 2016.	
Summary	<p>Very short intense rainfall when the river is higher than normal appear to overwhelm the drainage system. Water cannot discharge from the road into the river.</p> <p>A large amount of water was flowing down roads, unable to drain away. Roads still passable, however the nearby Polling station at Whitehall school tweeted for people to access it from an alternative entrance on Whitehall Road. @WestDraytonComC.</p> <p>A video posted by Get West London shows the same road being flooded on the 13th July http://www.getwestlondon.co.uk/news/west-london-news/watch-drivers-battle-through-flash-11609269 and 15th September http://www.getwestlondon.co.uk/news/west-london-news/flash-flooding-predictions-come-true-11892712 Stating it was the 3rd time this summer.</p>	

London Borough of Hillingdon	Actions completed	Highways Service - As Cowley road is a principal road the gullies are cleared twice a year. The service is considering road liable to flooding signs to warn road users. For Thames Water to investigate.
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7.4. Roads affected and type of flooding

Ward	Road Name	Post code	Type of flooding		Reported to		
			Internal	Other	Council	Thames Water *	Fire Brigade
Harefield	Jacks Lane	UB9 6H		x	x		
	Northwood Road	UB9 6P		x	x		x
	Park Lane	UB9 6B		x	x		
Northwood Hills	Alandale Drive	HA5 3U		x	x		x
	Addison Way	HA6 1S		x	x	x	
	Briarwood Drive	HA6 1P	x		x		
	Farmlands	HA5 2L					x
	Hilliard Road	HA6 1S	x		x		x
	Hillside Road	HA6 1		x	x		x
	Joel Street	HA5 2P		x			x
	Northwood Way	HA6 1A			x		x
	Pinner Road	HA6 1Q		x	x		
	Potter Street	HA6 1Q	x		x		
	Raisins Hill	HA5 2B	x		x		x
	Townsend Way	HA6 1T		x	x		
	Wyevale Close	HA5 2Q		x	x		
Northwood	Bayhurst Drive	HA6 3S		x	x		
	Chestnut Avenue	HA6 1H	x		x		
	Church Road	HA6 1A	x		x		
	Green Lane	HA6 3A	x		x		
	Hallowell Road	HA6 1D	x		x		x
	High Street	HA6 1B	x		x		x
	Linksway	HA6 2X					x
	Rickmansworth Road (Golf Club)	HA6 2Q		x	x		
	Rofant Road	HA6 3B		x	x		
Eastcote and East Ruislip	Roy Road	HA6 1E		x	x		
	Bridle Road	HA5 2S		x	x		
	Broadwood Avenue	HA4 7X	x		x		x
	Brook Close	HA4 8A	x		x		
	Brook Drive	HA4 8A	x		x		x
	Burwood Avenue	HA5 2R		x	x		
	Deerings Drive	HA5 2N					x
	Eastcote High Road	HA5 2E		x	x		
	Eastcote Road	HA4 8D	x		x		
	Evelyn Avenue	HA4 8A	x		x		
	Field End Road	HA5 1R		x	x		x
	Fore Street	HA5 2H					x
	Grooms Drive	HA5 2H					x
	Hale End Close	HA4 8				x	
	Hawthorne Avenue	HA4 8S	x		x		

	Joel Street	HA5 2P					x
	Kaduna Close	HA5 2P	x		x		
	King's College Road	HA4 7J	x		x		
	Meadow Close	HA4 8A	x		x		
	Midcroft	HA4 8E		x	x		x
	North View	HA5 1P	x		x		
	Park Avenue	HA4 7U	x		x		x
	Pinn Way	HA4 7Q					x
	St Martin's Approach	HA4 7Q		x	x		
	Sutton Close	HA5 2J					x
	The Close	HA5 1P		x	x		
	The Glen	HA5 2R		x	x		
Manor	Beechwood Avenue	HA4 6E				x	x
	Crosier Way	HA4 6H		x	x		
	Dartmouth Road	HA4 0D		x	x		
	Grosvenor Vale (Football Club)	HA4 6J		x	x		
	Herlwyn Avenue	HA4 6				x	
	Lawn Close	HA4 6E	x		x		
	Sunnydene Avenue	HA4 6A		x	x		x
	Victoria Road	HA4 9A	x		x	x	x
	West End Road	HA4 6D		x	x		
West Ruislip	Westfield Way	HA4 6H	x		x		x
	Brickwall Lane	HA4 8J		x	x	x	
	Fairfield Avenue	HA4 7P		x	x		
	Fine Bush Lane	UB9 6L	x		x		
	Howletts Lane	HA4 7R		x	x		
	Ickenham High Road	UB10 8L		x	x		
	King Edward's Road	HA4 7A	x		x		
	Kingsend	HA4 7D					x
	Ladygate Lane	HA4 7		x	x		
	Pembroke Road	HA4 8N	x		x		x
	Ruislip High Street	HA4 8L	x		x		
	Sharps Lane	HA4 7J	x		x		
	The Greenway	UB10 8L				x	x
	Wallington Close	HA4 7Y	x		x		x
	Westcote Rise	HA4 7L	x		x		
Cavendish	Woodville Gardens	HA4 7N					x
	Field End Road	HA5 1R	x		x	x	
	Southbourne Gardens	HA4 9T	x		x		x
	Torcross Road	HA4 0T		x	x		
Ickenham	Austins Lane	UB10 8R		x	x		
	Bridge Way	UB10 8				x	
	Breakspear Road South	UB10 8H		x	x		x

	Campden Road	UB10 8E	x		x		
	Charlbury Road	UB10 8E					x
	Copthall Road East	UB10 8S		x	x		
	Derwent Avenue	UB10 8H					x
	Glebe Avenue	UB10 8P	x		x		x
	Ivy House Road	UB10 8N					x
	Long Lane*	UB10 8Q	x		x	x	
	Milton Road	UB10 8				x	
	St George's Drive	UB10 8H		x	x		
	Swakeleys Road	UB10 8D					x
	Wallasey Crescent	UB10 8S		x	x		
	Warren Road	UB10 8A					x
	Woodstock Drive	UB10 8E					x
Hillingdon East	Long Lane*	UB10 8Q		x	x	x	x
	Regent Avenue	UB10 9A	x		x		x
	Sutton Court Road	UB10 9H	x		x		x
	The Dingle	UB10 0D		x	x		
	Windsor Avenue	UB10 9A		x	x		
Uxbridge North	Finians Close	UB10 9N					x
	Harefield Road	UB8 1P	x		x	x	x
	Heron Close	UB8 1B		x	x		
	High Street	UB8 1E					x
	Hillingdon Court Park	UB10 9N		x	x		
	Honey Hill	UB10 9N		x		x	
	Holm Grove	UB10 9L		x	x		
	Manor Way	UB8 2B					x
	Saunders Road	UB10 0				x	
Uxbridge South	Vine Lane	UB10 0				x	
	Austin Way	UB8 2Q					x
	Chiltern View Road	UB8 2Q		x	x		
	Cowley Mill Road	UB8 2		x	x		
	Cowley Road	UB8 2		x	x		x
Brunel	High Street	UB8 1H		x	x		
	Bartram Close	UB8 3A					x
	Copperfield Avenue	UB8 3N		x	x		
	Church Road	UB8 3N	x		x		x
	Hillingdon Hill	UB10 0J		x	x		
	Kingston Lane	UB8 3P		x	x		
	Moorfield Road	UB8 3S		x	x		
Yiewsley	New Road	UB8 3				x	
	High Street	UB7 7Q		x	x		
Heathrow	Bath Road	UB3 5				x	
Charville	Bury Avenue	UB4 8L	x		x		
	Dale Drive	UB4 8A		x	x		

	Hewens Road	UB4 8				x	
South Ruislip	Portal Close	HA4 6N		x	x		
	The Fairway	HA4 0				x	
	Queens Walk	HA4 0L		x	x		
Barnhill	Uxbridge Road	UB4 0				x	
Townfield	Central Avenue	UB3 2		x	x		
	Hawthorne Place	UB3 2D		x	x		
West Drayton	The Common	UB7 7H		x	x		
Yeading	Ashford Avenue	UB4 0N		x	x		

*A number of the roads affected lie in multiple wards

Please note that the reports listed in this table are those provided by Thames Water which are on their sewer flooding database and a Sewer Flooding Questionnaire has been completed. It does not refer to all incidents that were called in to their Customer Call Centre.

All report reference numbers have been removed at the request of Thames Water.

8. Information on roles and responsibilities

8.1.1. Key areas of responsibilities		
	Queries	Actions
1	Flooding on the road	<ul style="list-style-type: none"> • The Council as the Highway Authority is responsible for local roads. It undertakes annual maintenance on all gullies. • Despite the maintenance undertaken by the Council, problems can occur even when drainage installations are clean and well maintained. Heavy rain can wash leaves and other material into a gully, blocking them. • The gullies drain in most cases into surface water sewers which are under the ownership of the Water and Sewerage Company (WaSC), and in Hillingdon, this is Thames Water. Despite this, WaSC's have no legal responsibility for highway drainage and do not have a statutory obligation to accept highway drainage into public sewers. • Flooding can occur on a highway, even where the gully is clear, because there is a blockage within the surface water sewer. This can often be because of tree roots growing through the sewer or, inappropriate substances being discarded into the sewer. • When very heavy rain falls on the highway in a short period of time it can often exceed the capacity of the drainage facilities designed to take it away. Thus some water will be visible on a road after very heavy rain. Roads are designed to disperse water from the roads and footways into the gullies as quickly as possible. • Please allow time to see if the water drains away. Water can remain for a while in low spots in the road even when the drainage system is working. • If the water remains after a number of hours, report it to the Council to investigate to see if the gully is blocked. • If it is the surface water sewer that is causing the flooding, this will need to be reported to Thames Water to investigate, and cleared. More information on the rights and responsibilities of different parties can be found on the "Road Drainage and gullies" page on the Hillingdon website . • If you know it is a gully that is blocked, and have seen a road flood but it has not cleared, please use the following options: <ul style="list-style-type: none"> • Report It on the website or call the Hillingdon Contact Centre: 01895 556000 • If the flooding appears from a public sewer manhole and you know it is a Thames Water Sewer Report it on the Thames Water Website or call them on: 0800 0093964 (choose option 2 and then option2)
	Main River	<ul style="list-style-type: none"> • The Cannon Brook, River Pinn, Yeading Brooks and Joel Street Farm Ditch are designated main rivers. The Environment Agency is the lead risk management authority on these watercourses and are funded to undertake a degree of maintenance. • More information and links to the Environment Agency Maintenance Programme can be found on the government website: https://www.gov.uk/government/publications/river-and-coastal-maintenance-programme
3	Reservoirs - Ruislip Lido	<ul style="list-style-type: none"> • The Council is the landowner at Ruislip Lido and manage the water levels in the Lido very carefully and in a way approved by the Environment Agency. A Flood Risk Assessment and modelling was undertaken by consultants on behalf of the Council and submitted to the Environment Agency to approve to establish the risk. • The water level is measured regularly in order to maintain it at the agreed level. • The only parts the Council can operate at the Lido are some small valves which are limited in the amount they can discharge. The valves are opened and closed accordingly to manage water levels. • The Council in accordance with the agreement with the Environment Agency do not discharge water from the Lido when it is raining. • The valves were closed before, during and for approximately 5 days after the flooding on the 23rd June. • The Lido and any flows from the valves cannot have affected the residents at Brook Drive or Joel Street. The Lido discharges to the Canons Brook River which flows into the River Pinn much further downstream, near Ruislip golf course. The River Pinn flows south from there towards Yiewsley.

9. Actions

The following address some generic queries that residents have had regarding the actions taken at various points, during and after a flood event.

9.1.1. Emergency Actions		
	Queries	Response
1	The Council Highways Service. Road closure and warning signage.	<ul style="list-style-type: none"> Consideration of road closures - in an event similar to this, of very heavy rain in a short period of time, over 150 roads would need to be closed. The Highways service would not have the resources to close that many roads in such a short period of time. This would have an even more significant effect on the traffic, than occurred in this incident. A number of places were at a standstill for a number of hours because of visibility and access. However there are key sites which are frequently flooded to a significant depth such as Victoria Road, Ruislip Manor and Breakspear Road South, where 'Road liable to flooding' permanent warning signs are being considered by the Highways Service as an appropriate measure to be put in place.
2	The emergency response in a heavy rainfall event.	<ul style="list-style-type: none"> In a sudden heavy rainfall event, there is a limited response that the Council and other organisations such as Thames Water, the Fire brigade etc. can provide. On the day of an event, there is limited specific advice that can be provided in a short space of time, and to the volume of people that may require it. The Council have improved the level of information on the Council website and would encourage all residents to check if they are in an area at risk of Surface water flooding, as well as at risk from river flooding. All residents in areas at risk are recommended to undertake their own personal flood plan and where possible work with others in their community to develop a community flood plan. Information on these are contained on the "Flooding" page on the Council website. These should be kept in an easily accessible form in hard copy in the event of loss of power. Where possible to make a record of time and what happened and where water came from ideally taking photos with timestamps are particularly useful.
3	Emergency Services	<ul style="list-style-type: none"> The Emergency services are briefed as part of regular meetings of the London Resilience Forum on key issues faced by London Boroughs. They will respond in an emergency, but should only be called when there is a risk to life. In a storm event similar to this, they will find it difficult to attend all the potential calls they may receive, and are able to do very little to save a property from flooding.

9.1.2. Actions taken after the flood event		
	Queries	Response
1	What happens after the investigation?	<ul style="list-style-type: none"> Once the evidence have been collated, there can then be analysis undertaken of how the Council responded in the event and recommendations or lessons learnt collated. Reported flooding sites, from the finalised investigation will then be incorporated into an update of the Hillingdon's Surface Water Management Plan. These will be prioritised in accordance with the consequences of the flood and the numbers affected against those sites already on the action plan. Where possible, the most affected sites will be the subject of applications for external funding by the Council. This will allow the Council to investigate further and determine if there is a future scheme to alleviate flooding. These applications will have to be approved by Cabinet and will be assessed on their cost benefit against all other schemes put forward in the River Thames region. It will therefore take time to develop any long term potential solutions and then implement them. In addition each service area will be made aware of key flood hotspots so that they can incorporate flood mitigation in any works they have planned in the area. If no

		<p>works are planned each service area will decide how to take forward individual schemes to alleviate flooding where budget allows.</p> <ul style="list-style-type: none"> • Critical Drainage Areas will be updated. CDAs are identified in the Surface Water Management Plan for Hillingdon as the catchment area from which surface water drains and contributes to drainage problems. • The Council understands the concerns of residents who will wish to see action taken quickly, but it is important that the Council understand and prioritise resources and funding to those affected most as identified in the investigation. • There are a number of sites where 'quick wins' have been identified and action taken by the Council already. These are noted in the individual investigation pages. • In addition once this Investigation forms the evidence base of the issues it allows the Council to apply for further funding, for the most affected areas to look into potential solutions. • The Council recommends that the best way for residents to gain peace of mind is to implement flood resistant measures such as flood doors and air brick covers as well as resilient measures i.e. if it floods, the property can recover from a flood more quickly. This includes raising electrical sockets, using tiled floors etc. Links to further information have been provided on the Council website on the "Flooding" pages.
2	Highway works	<ul style="list-style-type: none"> • Resurfacing works. A number of residents in different areas suggested that that road resurfacing had raised the level of the road and there was less space for water to be stored. As a result they wished for road to be lowered and or the footpath to be raised. Road levels are generally dictated by the level of existing kerbs, gullies and the level at the back of the footway. The existing surface course material is removed and new surface course material is laid. Most resurfacing involves the removal and replacement of new material to the existing levels. Where roads are overlayed this would not significantly affect the flood storage capacity given that the road surface is laid to create a gradient towards any gullies. • Traffic Calming. Residents have also raised issues with existing and proposed traffic calming not allowing water to flow down the road and into gullies. Highways are investigating where residents have raised these concerns. Where appropriate additional gullies or bypass channels may be introduced. • In addition a number of residents have requested additional gullies. The Highways Service will consider each case individually. Additional gullies would have no benefit if the sewer is under capacity. Additional gullies will typically be installed to ensure that there are no low spots or significant ponding on the road. Gullies provide a very limited amount of additional space for water and will not provide sufficient additional space for all the water that caused flooding in June 2106. This is often because water is draining from a much wider area than just one road and the sewer may already be full.
3	Working with other organisations	<ul style="list-style-type: none"> • Thames Water -The Council has raised concerns with Thames Water with their diagram showing responsibilities of different parties in managing flooding as found on the Thames Water website. The Council consider it to be misleading. Thank you to residents in Ruislip for bringing it to the Council attention. Thames Water are considering various alternatives to the proposed diagram that accommodate the majority of various drainage scenarios in their operational area with the intention of revising the website. • London Underground- The Council have met with London Underground to ask for an update on the actions that LU will be taking to reduce the flooding on the Metropolitan line and at Ruislip Manor Station as well as protect their commercial tenants within the station. • TFL - The Council has also initiated discussions with TFL to understand the actions they have taken or will be taking to reduce flooding on the A40. • Environment Agency - The Council have also met with the Environment Agency on a number of occasions to discuss their planned maintenance, potential funding for new schemes and further meetings are planned to take forward the River Pinn Flood Alleviation scheme.

		<ul style="list-style-type: none"> ● Affinity Water- The Council are in contact with Affinity Water to discuss their plans to alleviate the potential risk of the water main in Park Woods both in the long and short term. The Council has also asked them to carefully identify other areas that may be at potential risk from this issue.
4	Council Tax	<ul style="list-style-type: none"> ● The Council can provide and has applied on request a standard discount for empty unfurnished property and empty property in need of structural repair/alteration for a maximum exemption is 21 days. ● Any scheme to extend this under Section 13a of the LGFA 1992 is to reduce council tax on an individual basis due to hardship. However, to apply for such a discount the Council would be required to assess the individual's income and outgoings and they would have to be able to prove real financial hardship. ● Further investigations reveal the Council could use this provision (S13a) to develop a scheme to identify a class of property that could qualify for such relief - this power is used for the current over 65's relief. This scheme would have to be developed for those affected in the future. Any such scheme would be fully funded by the Council itself and would require Council approval of the scheme. Criteria and a policy would need to be agreed before any further relief could be awarded in these circumstances. ● Insurance companies should cover any cost rather than local taxpayers. There appears to be varying responses from most insurance companies as to what they cover for residents. ● It is therefore recommended that anyone in an area at risk of flooding checks their house insurance policies to ensure Council tax is included.
5	Communications	<ul style="list-style-type: none"> ● The Council published a Hillingdon People Article January 2017 to ensure that as many people are aware of the roles and responsibilities of different aspects of flooding. ● The Council has also provided information in the "My Ruislip" news. ● The Council has continued to update the Council website with useful information for residents on action that can be taken, as well as contact details and roles and responsibilities of different organisations over the last few years taking on board feedback from previous events. ● A Flood and Water Information Map providing an overview of flood risk in the Borough is available here; http://www.hillingdon.gov.uk/article/28579/Rivers-ditches-and-canals
6	Collection of reports of flooding	<ul style="list-style-type: none"> ● As recommended by previous investigations, a survey, had been drafted to obtain more specific information about whom and what is affected. Unfortunately it was not finalised on the 23rd June, but it is now available for future events. This will make it easier to collect the information needed from residents, in a way that is easier for them. ● A request was made by the Council to Thames Water so that the information on the Sewer Flooding Questionnaire, can be shared with the Council. Their form has now been amended to allow residents to check the box so that this can be shared upon request and is available through the Thames Water website, in order that future investigations can obtain information more quickly and easily. ● The Council will update the Preliminary Flood Risk Assessment with reports of flooding in the Borough.

9.1.3. Actions taken and ongoing by other organisations

	Queries	Actions
1	DEFRA	<ul style="list-style-type: none"> ● Grants or Relief The Government has made no provision or grants available to residents and businesses for anyone affected in this particular event, similar to those it made available in the winter 2013-2014 events.

2	Environment Agency	<ul style="list-style-type: none"> ● Flood warning. <ul style="list-style-type: none"> ○ Telemetry review. The Environment Agency undertake this shortly after issuing any flood warnings, so validation of each warning issued was carried out on the River Pinn within a few weeks of the event. (For information a large number of properties that were affected were flooded by surface water, so the Environment Agency telemetry and warnings issued do not reflect this). ○ The Environment Agency are reviewing the timeliness of some of the flood warnings to ensure their lead time targets are met and see if and where they could be improved, but are fairly confident in the threshold levels set, although visits to these sites to make another assessment from the field are planned. ○ Increase in gauges are being planned at a number of key points within the borough to help inform flood warnings and the operational response of the Environment Agency and aim to share this information with the Council. ○ The implementation of the Extended Floodline Direct Warning system which allows the Environment Agency to provide some information about the Local Authority during a flood event to save residents contacting multiple organisations. ● Operational response. <ul style="list-style-type: none"> ○ The Council have also initiated meetings with the Environment Agency to discuss the better sharing of information on teams out on the ground to ensure improved coverage of resources. ○ At these meetings it has been requested that the Environment Agency provide more detailed information on the work that they are doing to maintain rivers and where a Riparian owner may need to do work. The Environment Agency are currently implementing a new maintenance planning system which will improve the information available. The 2017/2018 planned maintenance was not shared by the Environment Agency for comment by the Council in advance of its release. A planned meeting to discuss the plans in January was cancelled and no alternative date provided. A further discussion was requested by the Council with new director Simon Hawkins to discuss these issues and ways of working more effectively in the future on the 24th April 2017. ● Reporting <ul style="list-style-type: none"> ○ A report on the Western catchments of London within the Herts and North London Environment Agency officer has been drafted. The report is not being published by the EA but will be available on request from the office HNLenquiries@environment-agency.gov.uk
3	Thames Water	<ul style="list-style-type: none"> ● The Council has initiated and held meetings with Thames Water to discuss the feedback from residents following this flood event. A meeting led by Cllr Bianco was held with Thames Water External Affairs Director Richard Aylard on the 20th Feb 2017. At the meeting the following issues were discussed and agreed: <ul style="list-style-type: none"> ○ The current diagram on the Thames Water website does not provide clear advice on the roles and responsibilities of different organisations in managing flooding. A revised process diagram has been drafted and is being discussed by the Council and Thames Water. ○ Clarity of the process Thames Water use to ensure that flooding is recorded properly ie that the Sewer Flooding Questionnaire must be filled in. ○ Issues arising from uncertainty on the ownership of certain assets for residents. ○ Provision of clarity on ownership by Thames Water to all those affected.

9.1.4. Actions to be undertaken	
The Council	<ul style="list-style-type: none"> • Continue to promote the 'roles and responsibilities' information so it is clear to residents what the Council can and can't do to alleviate flooding for residents. • Promote this to Street Champions to help get the message out to residents. • A review of the emergency process for responding to queries on flooding out of hours has commenced but not yet been completed. • To continue to work with the Environment Agency in prioritising the area's most at risk of flooding from any source for their maintenance. Environment Agency currently focus on the maintenance they are funded to undertake on main rivers on areas affected by fluvial flooding however other areas may be more important as lack of maintenance can affect surface water flooding too. • To finalise investigations and provide feedback to residents and contacts directly where issues have been reported. <p>Ongoing Actions following every investigation:</p> <ul style="list-style-type: none"> ○ To continue working towards delivering the legal requirements of the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009. ○ To continue implementing the Surface Water Management Plan Part 2 Actions. There are a number of actions to manage flood risk from local sources such as surface water and groundwater which the Council has already set out in the SWMP. Some of these actions are repeated below: <ul style="list-style-type: none"> ■ Following this investigation the Council will update the Surface Water Management Plan: Evidence and Action Plans, Appendix A Site Specific Actions and Appendix C Generic Council Actions. ■ Continue to progress site specific projects. To publish the Flood Investigation report and notify other Risk Management Authorities with Actions. ■ Following investigations, the Council to work with other responsible bodies and identify landowners to ensure they are taking appropriate action to reduce flood risk.
The Environment Agency	<ul style="list-style-type: none"> • To provide the Council and residents any evidence they have collected from the 23rd June flood event. I.e. data collected, actions taken by the Environment Agency during the event, both of a warning nature and during the event as well as information on the annual responsibilities it has to and any changes to the work it undertakes based on the events of the 23rd June. • Provide the Council with feedback on the review of the location and warning capability of the Environment Agency in areas affected by this event which do not have a specific river gauge such as the Cannon Brook and Ickenham Stream, started after previous flood events. • To share more clearly information on management and maintenance and projects to allow the Council and other Riparian owners to develop their own programme of works and maintenance. • To recognise that state of main rivers can have an impact on other sources of flooding. • To provide specific advice and support to residents on the formation of Flood Action Groups • To continue to work with the Council and engage with the residents on the development of Flood Alleviation projects and specifically progress the River Pinn Flood Alleviation project.
Thames Water	<p>As agreed with the Council</p> <ul style="list-style-type: none"> ○ Amend the diagram explaining the roles and responsibilities in agreement with the Council. ○ Provide the actions taken by Thames Water so they can be reviewed. ○ Promote the need to fill in the Sewer Flooding Questionnaire to allow prioritisation of funds for future alleviation schemes. ○ Follow and provide appropriate information on the response to reported flooding for inclusion within Flood Investigations ○ Where identified, resolve any asset ownership queries appropriately.

TFL	Provide further updates to the Council on the actions taken to alleviate flooding on the A40.
London Underground	<ul style="list-style-type: none"> ● Provide further updates to the Council on the actions taken at Ruislip Manor <ul style="list-style-type: none"> ○ To protect the station ○ To protect their tenants and other commercial premises. ● Investigate the contribution that the wider Thames Water sewers have to flooding on the Metropolitan line. ● Investigate the drainage assets within London Underground ownership at Eastcote Station to see if there is any issue in the drainage system and take action where necessary to alleviate it.
Network Rail	Provide further updates on the measures Network Rail can take at Breakspear Road South and at Lawn Close, near Ruislip Manor to the north side of the line to help alleviate flooding.
Emergency Services	The Council will continue to formally request information on their response to flooding incidents.
Residents	<ul style="list-style-type: none"> ● To take action by producing individual and business and community Flood Plans ● Use the 'resilience' measures tool, (Detailed in the SWMP Options and Actions Plan Part 2 Appendix B). ● Where groups of residents have been affected, both the Environment Agency and the Council would recommend residents forming a Flood Action Group which has worked well in other parts of the country to allow organisations to more easily engage with residents.

10. Key links and sources

10.1. Useful Organisations

Organisation	Information	Link
EA	Long term flood risk information	https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=357683&y=355134&scale=2
	Flood Plans	https://www.gov.uk/prepare-for-a-flood/make-a-flood-plan
	Making a flood plan Online	https://www.gov.uk/prepare-for-flooding/future-flooding
Thames Water	Thames Water Contact us Page	http://www.thameswater.co.uk/16266.htm To report issues Tel 0800 0093964
	Sewer Questionnaire	https://live.thameswater.co.uk/-/media/site-content/thames-water/help-and-advice/sewer-flooding-questionnaire.pdf
	'Bin it don't block it' Campaign - Appropriate disposal of fats	https://www.thameswater.co.uk/help-and-advice/drains-and-sewers/blockages/bin-it-dont-block-it
London Borough of Hillingdon	Flood Risk Portfolio Including: Surface Water Management Plan Part 1 & 2	http://www.hillingdon.gov.uk/article/26402/Surface-water-management-plan
	Rivers, Ditches and Canals responsibilities	http://www.hillingdon.gov.uk/article/28579/Rivers-ditches-and-canals
	Road Drainage responsibilities	http://www.hillingdon.gov.uk/article/26542/Road-drainage-and-gullies
	Information on Property Drainage responsibilities	http://www.hillingdon.gov.uk/article/12787/Property-drainage
National Flood Forum	Information on flood products and companies	http://www.bluepages.org.uk
	Insurance	http://www.nationalfloodforum.org.uk/trouble-getting-insurance/

10.2. Specific Event links

Get West London	Flood Event articles	http://www.getwestlondon.co.uk/news/west-london-news/watch-two-men-refuse-nightmare-11532034 http://www.getwestlondon.co.uk/news/west-london-news/motorists-kinds-mishaps-after-storms-11521084
YOUtube	Field End Road, Eastcote	https://youtu.be/zv9WouMN-t8

Hillingdon is Here	Flood Event Articles	http://www.hillingdonishere.co.uk/index.php/news/item/392-flash-floods-hit-sparking-transport-chaos-and-police-warning
MyRuislipNews	August Edition	http://www.mynewsmag.co.uk/magazine/myruislip/

10.3. Local Groups

Ruislip Residents Association		http://www.ruislipresidents.org.uk/faqs/
Ickenham Residents Association		http://ickenhamresidents.co.uk/
Eastcote Residents Association	Information on recent Flood Forum on the 17th May 2017	http://eastcoteria.co.uk/era-news/124-local-flooding
Friends of Pinn Meadows		https://www.hillingdon.gov.uk/article/14510/Friends-of-Pinn-Meadows