

26<sup>th</sup> January 2015

# Buckinghamshire County Council

## Flood Investigation Report

Hedgerley Lane, Beaconsfield

December 2013 - January 2014



*Photo courtesy of Harrias House , 7<sup>th</sup> February 2014.*

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## Revision Schedule

### **Buckinghamshire County council** **Flood Investigation Report**

26<sup>th</sup> January 2015

Final revision number 2

<b>Rev</b>	<b>Date</b>	<b>Details</b>	<b>Author</b>	<b>Checked and Approved by</b>
<b>1</b>	18/12/2014	Draft for Review	Jessica Dippie	Karen Fisher
<b>2</b>	26/01/2015	Final Report	Jessica Dippie	Karen Fisher

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## Executive Summary

This report has been produced by Buckinghamshire County Council (BCC) to investigate the flooding that occurred on Hedgerley Lane in Beaconsfield between 4<sup>th</sup> and 16<sup>th</sup> January. The report provides details of the event and makes recommendations for Risk Management Authorities (RMAs) to undertake to reduce future flood risk.

A Section 19 Investigation is a statutory requirement for Lead Local Flood Authorities (LLFA) under the Flood and Water Management Act (FWMA) 2010. On becoming aware of a flood in its area, the LLFA must, to the extent that it considers it necessary or appropriate, investigate:

- Which RMAs have relevant flood risk management functions; and
- Whether each of those RMAs has exercised, or is proposing to exercise, those functions in response to the flood.

Although this flood event did not meet BCCs criteria for carrying out a Section 19 Investigation it was deemed necessary to produce this report as decided by the Buckinghamshire Strategic Flood Management Committee.

The aim of the Section 19 Investigation is to give an explanation of what happened in the flood event and what were the RMAs responsibilities during the event. The recommendations are there to help the RMAs learn lessons from the event and to move forward with the management of flood risk in the future.

The flood event at Hedgerley Lane in Beaconsfield occurred due to Pyebush Lane pumping station being turned off for a period of time. The high groundwater levels and excessive surface water were a contributing factor after a prolonged period of above average rainfall. The closure of the pumping station prompted Thames Water to use tankers to manage the flows, as is normal operating procedure. However, due to groundwater infiltration in to Thames Water pipes the volumes were too much to manage and they surcharged out of manholes on Hedgerley Lane, causing a flood of contaminated water which caused the road to be impassible via vehicles and on foot. The event posed serious environmental and public health risks as well as difficult access to the properties cut off, which include a care home and nursery.

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## 1. Introduction

### 1.1 Background to investigation

BCC as the LLFA has a responsibility to record and report flood incidents as detailed within Section 19 of the FWMA 2010:

#### Section 19

- (1) On becoming aware of a flood in its areas, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate-
- (a) which risk management authorities have relevant flood risk management functions, and
  - (b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.
- (2) Where an authority carries out an investigation under subsection (1) it must-
- (a) publish the results of its investigation, and
  - (b) notify any relevant risk management authorities.

BCC has established criteria for section 19 flood investigations which can be found in the appendix.

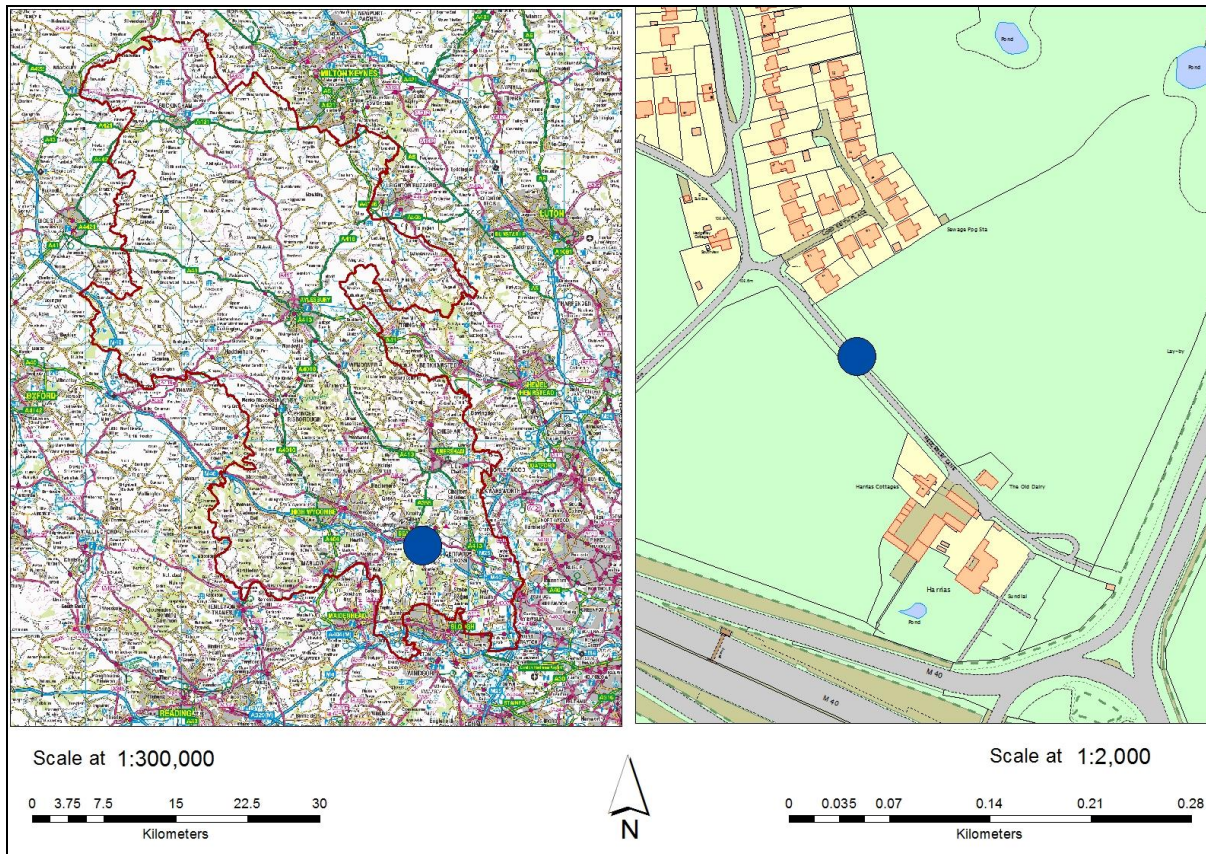
It was deemed necessary to complete an investigation into the flood incident in Bishopstone because it meets the following threshold:

- caused a transport link to be totally impassible:
  - Motorways, trunk roads and major rail links – 2 hours or more
  - Class A and B highways and other railway links – 4 hours or more
  - Class C highways – 10 hours or more
  - Class U highways – 24 hours or more.

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## 1.2 Site location

Hedgerley Lane is a dead end lane to the South East of Beaconsfield adjacent to junction 2 of the M40, as shown in Figure 1.



**Figure 1** Location maps for Hedgerley Lane at County and local level (Ordnance Survey License 100021529 2014)

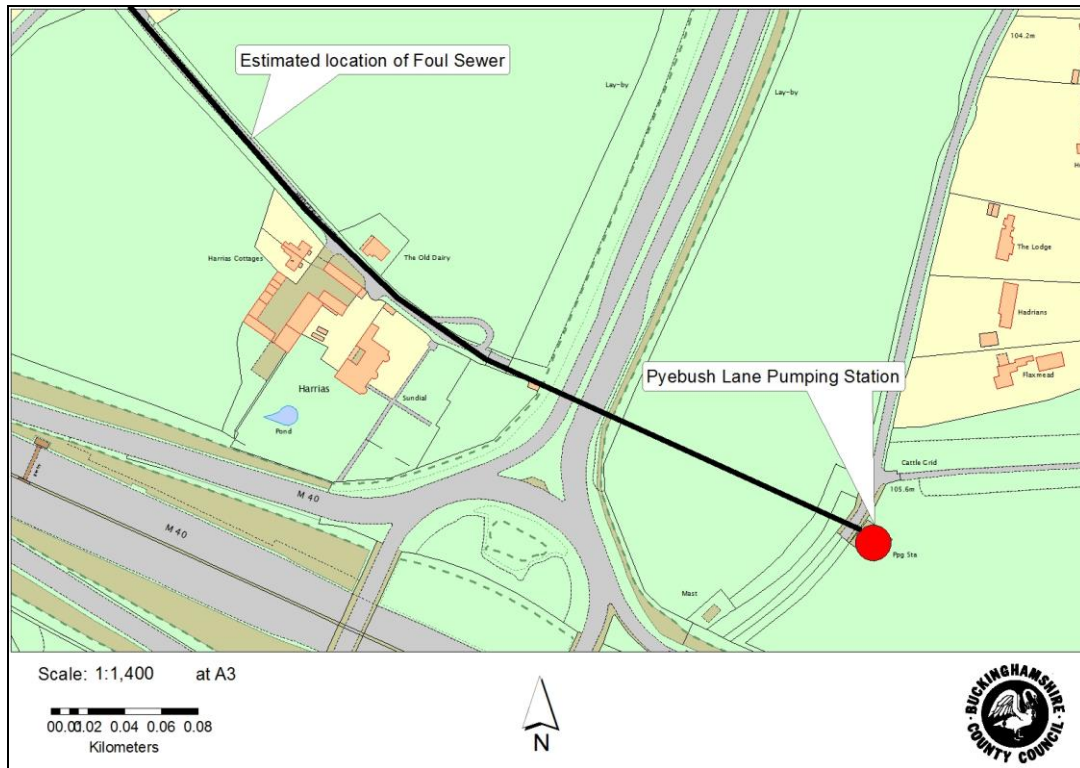
## 1.3 Drainage system and river network

There is no highway drainage or roadside ditches on Hedgerley Lane. There is a ditch situated on the corner of Hedgerley Lane and Cross Lane, this is also where the highway drainage starts and extends up in to Beaconsfield. The Thames Water pumping station is situated at the end of Pyebush Lane, and the foul pipes are thought to run under Hedgerley Lane up in to Beaconsfield. The location of the foul pipes are estimated in figure 2.

There are no watercourses situated close to Hedgerley Lane.



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**Figure 2** Map showing Pyebush pumping station and the estimated location of the foul sewer (Ordnance Survey License 100021529 2014)

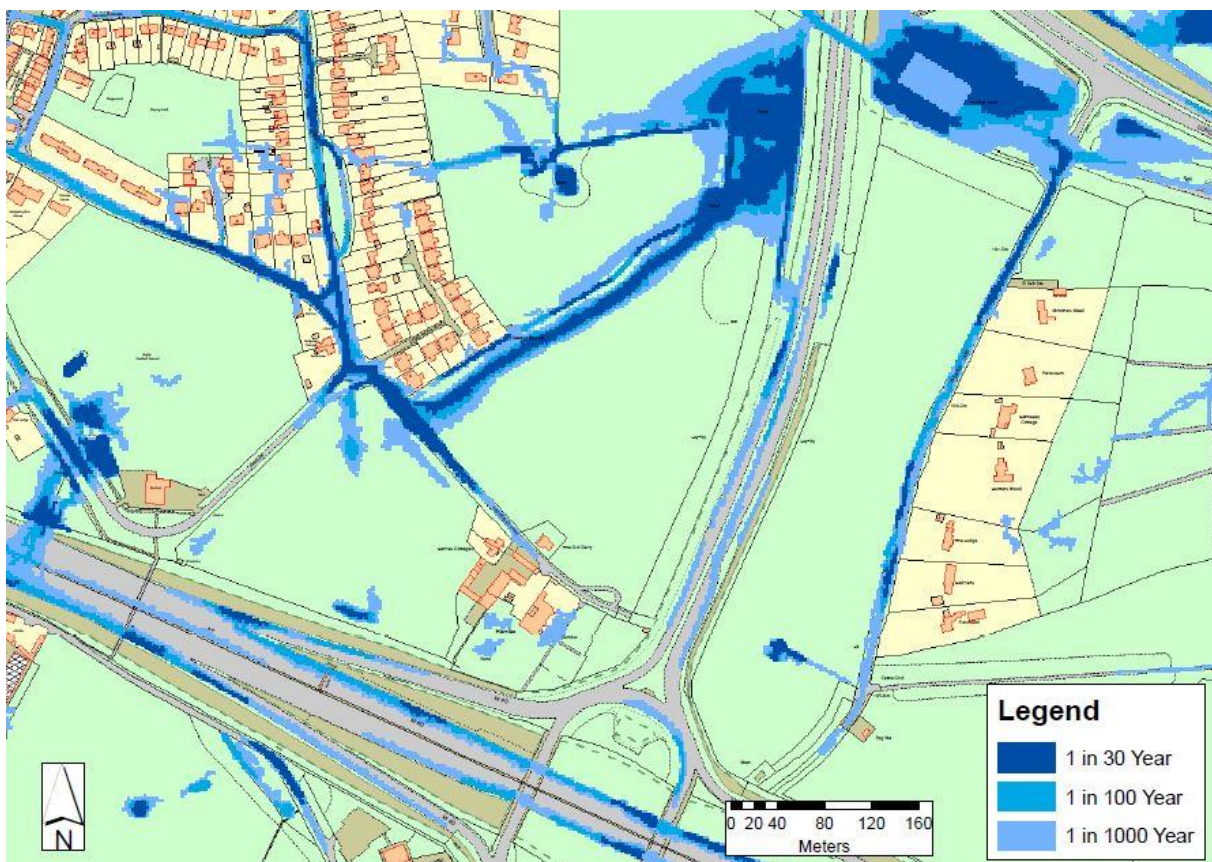
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## 2. Background

### 2.1 Site characteristics

There are no watercourses situated near to Hedgerley Lane and on the Environment Agency's (EA) fluvial flood map, this area is shown up as being in Flood Zone 1 which means there is a low probability of flooding from a watercourse.

The surface water flood map (Figure 3) shows the difference in the extent of flooding in the 1 in 30 year, 1 in 100 year and the 1 in 1000 year events for the area surrounding Hedgerley Lane. Surface water flooding occurs when extreme or prolonged rainfall cannot infiltrate into saturated ground, or flow into the rivers and/or highways drainage due to high volumes of water.

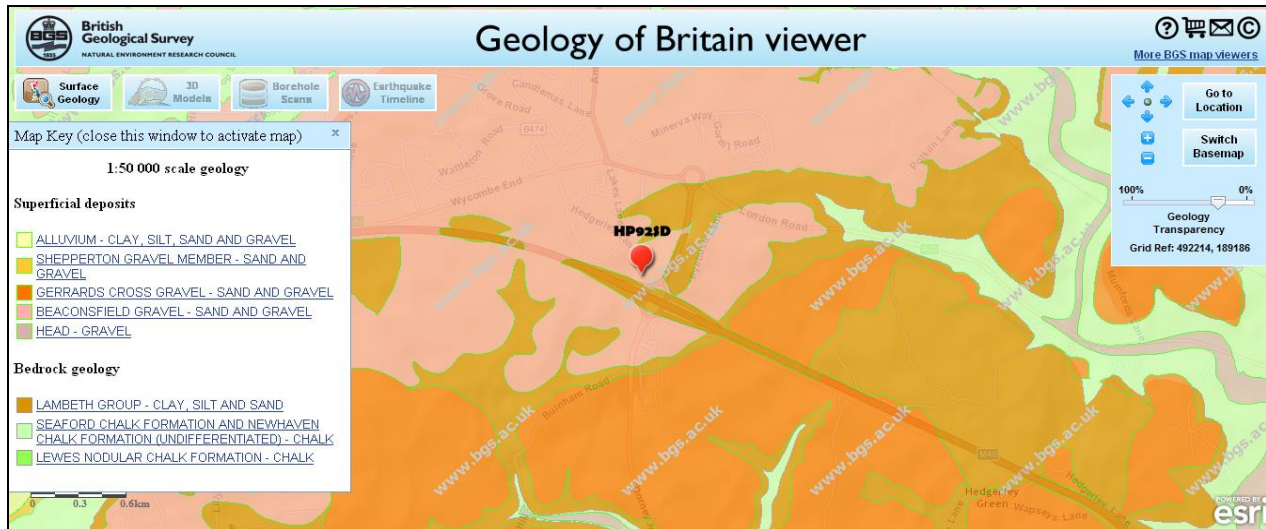


**Figure 3** Surface water flood map showing predicted extent across Hedgerley Lane (EA, 2014) (Ordnance Survey License 100021529 2014)



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From figure 3 it can be seen that Hedgerley Lane is predicted to suffer from surface water flooding in a 1 in 30 year event. This indicates that the January flood event was probably a combination of surface water flooding and the foul sewer surcharge.



**Figure 4** Geology of Wexham (BGS online map, 2014)

Hedgerley Lane is situated on superficial head (clay, silt, sand and gravel) and the solid geology is also clay, silt and sand (Lambeth Group) as shown in figure 4 above.

## 2.2 Previous flood events

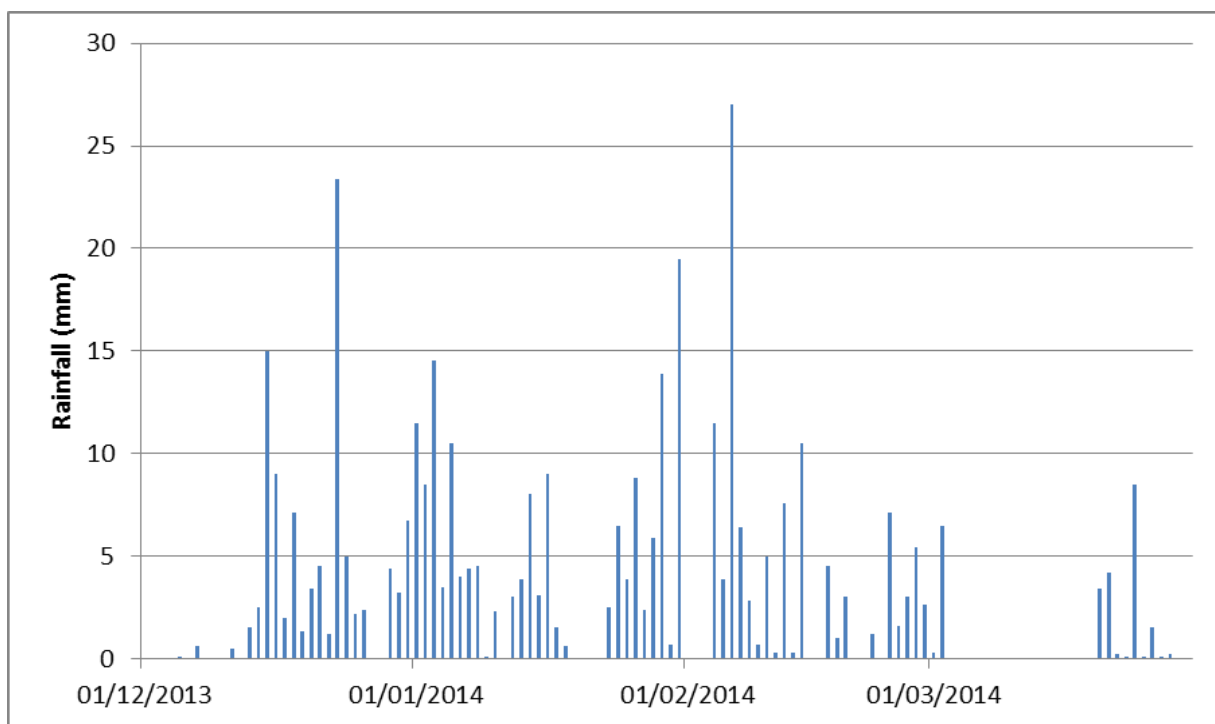
Flooding has been experienced in this location in previous years as a result of surface water and the failure of Thames Water Pyebush Lane pumping station. The event at the beginning of January 2014 was the worst on record, and since this event there have been further floods in February and March, this information was supplied by staff at the Harrias House care home.

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## 3. Analysis of Flood Event

### 3.1 Conditions at the time

The EA provided the rainfall data for the period of the event. The nearest EA rain gauge is Maple Lodge Sewage Treatment Works (STW). Figure 5 below gives the daily rainfall totals from the Maple Lodge STW rain gauge for December 2013, January, February and March 2014. From this data it can be seen that there were constant high levels of rainfall with high peaks of over 20mm in December 2013 and February 2014.



**Figure 5** Daily total rainfall for rain gauge at Maple Lodge STW from December 2013 To March 2014 (EA, 2014)

### 3.2 Condition of features

The condition of the foul sewer on Hedgerley Lane is unknown to us. However Thames Water have reported that due to a broken sewer in Gregories Road the Pyebush Lane pumping station was closed for the duration of the flood event.

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### 3.3 What happened?

On the 31<sup>st</sup> December 2013 a broken foul sewer in Gregories Road, Beaconsfield caused Thames Water to close the Pyebush Lane pumping station. Thames Water used tankers to manage the flows at the pumping station; however their capacity was exceeded due to groundwater and surface water infiltration. This caused the foul sewer on Hedgerley Lane to surcharge and flood. The contaminated flood water covered Hedgerley Lane and made it impossible to pass through. Thames Water's contractors, Flowline, started to collect the flood water using a tanker and discard it in to a foul sewer close by. This process continued day and night to keep the flood water on Hedgerley Lane at bay. For a reason unknown, Flowline stopped tankering on the 14<sup>th</sup> January 2014, causing the contaminated water to collect in Hedgerley lane, reaching a depth of 9-12 inches. On the 16<sup>th</sup> January 2014, unknown action was taken by Thames Water which cleared the flood water away from Hedgerley Lane. They completed the decontamination of the road the following week.

### 3.4 Possible causes

#### *The weather conditions*

- Continued high levels of rainfall throughout December 2013, January and February 2014 (see figure 5).
- Peaks in the rainfall in December 2013 and February 2014 (see figure 5).
- Saturated soils due to high groundwater levels and continued high levels of rainfall increasing the surface water runoff.

#### *The condition of the drainage*

- Closure of Thames Water Pyebush Lane pumping station.

### 3.5 Incident response

#### *Buckinghamshire County Council Resilience Team*

BCC resilience team were notified on the 4<sup>th</sup> January 2014 by Buckinghamshire Fire and Rescue (BFR) of a reported burst sewer and that assistance was required to help staff access the care home (Harrias House) as the flood water was too deep for vehicles to pass through. The resilience team contacted the off road group who were deployed to help transport staff successfully.

#### *South Bucks District Council*

The environmental health team at SBDC closed the nursery on the 16<sup>th</sup> January 2014 to avoid children walking through the contaminated water and spreading it inside the

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buildings. They were also on site throughout the flooding to advise where necessary.

### *Thames Water*

Thames Water closed the Pyebush Lane pumping Station on the 31<sup>st</sup> December 2013 due to a broken sewer in Gregories Road, Beaconsfield. Their sub-contractor Flowline was on site from the 4<sup>th</sup> January 2014 to the 14<sup>th</sup> January 2014 to tanker the contaminated flood water away and keep the levels down, they did this throughout the day and night, as is normal operational procedure. Thames Water reported that the infiltration of ground and surface water meant that the volumes exceeded what could be tankered efficiently; their operation was also hampered by the topography as they could only access the station with small tankers and they had to limit the number of vehicles to avoid worsening the congestion.

The 24hr tankering was stopped for an unknown reason on the 14<sup>th</sup> January. It is thought that Thames Water attended site on the 16<sup>th</sup> January 2014 to resolve the flood issue, although this has not been confirmed.

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## 4. Responsible Authorities and Landowners

There are different responsibilities for flood management depending on the type of flooding. Organisations responsible for flooding are known as Risk Management Authorities (RMAs) and their responsibilities are detailed below. Riparian landowners also have responsibilities for watercourses across their land and these are also detailed below. These are summaries of the details included in the Buckinghamshire County Councils Local Flood Risk Management Strategy (2013-2018).

### 4.1 Lead Local Flood Authority

The Lead Local Flood Authority in this area is Buckinghamshire County Council. Buckinghamshire County Council has a role as a RMA in coordinating management of local flood risk from surface water, ground water and ordinary watercourses in the county.

### 4.2 South Bucks District Council

South Bucks District Council have responsibilities to inspect and maintain watercourses on District Council land, respond to requests for assistance during flood events and have the power, if instructed by Buckinghamshire County Council, to carry out flood risk management work which will benefit management of surface runoff, groundwater and ordinary water courses.

### 4.3 Environment Agency

The Environment Agency is one of the RMAs as defined by the Flood and Water Management Act 2010. Protecting the river environment and managing flood risk is part of their job. The EA is the RMA for flooding from main rivers.

### 4.4 Highways Authority – Transport for Buckinghamshire

Any flooding from highways is managed by the Highways Authority which is BCC and the highways function is managed by TfB.

### 4.5 Water Utility Company – Thames Water

Thames Water is responsible for flooding from foul sewers and surface water sewers which they own. Whilst undertaking this they must manage flood risk from sewers.



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#### **4.6 Landowners and riparian owners**

Landowners and riparian owners must maintain any culvert, or the bed and banks of any adjacent watercourse. They should clear away any debris from the watercourse or culvert even if it did not originate from their land.

Riparian owners can find further guidance on their responsibilities as landowners in the Environment Agency document 'Living on the Edge' which can be found online at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/297423/LIT\\_7114\\_c70612.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297423/LIT_7114_c70612.pdf).

#### **4.7 Residents**

Residents have a responsibility to take measures to protect themselves and their property when flooding is imminent.

#### **4.8 Emergency responsibilities**

The emergency responsibilities are outlined in table 1 below. Please note that Parish and Town Councils do not have a legal obligation to respond to emergencies. Whatever service they provide is voluntary and unique to each Parish or Town Council.

26<sup>th</sup> January 2015**Table 1** Roles and responsibilities in an emergency, during and after a flood event

<b>Local (County and District) Authorities</b> <ul style="list-style-type: none"> <li>• Coordinate emergency support within their own functions</li> <li>• Deal with emergencies on 'non main rivers'</li> <li>• Coordinate emergency support from the voluntary sector</li> <li>• Liaise with central and regional government departments</li> <li>• Liaise with essential service providers</li> <li>• Open rest centres</li> <li>• Manage the local transport and traffic networks</li> <li>• Mobilise trained emergency social workers</li> <li>• Provide emergency assistance</li> <li>• Deal with environmental health issues, such as contamination and pollution</li> <li>• Coordinate the recovery process</li> <li>• Manage public health issues</li> <li>• Provide advice and management of public health</li> <li>• Provide support and advice to individuals</li> <li>• Assist with business continuity</li> </ul>	
<b>Police Force</b> <ul style="list-style-type: none"> <li>• Save life</li> <li>• Coordination and communication between emergency services and organisations providing support</li> <li>• Coordinate the preparation and dissemination</li> </ul> <b>Fire and Rescue Service</b> <ul style="list-style-type: none"> <li>• Save life rescuing people and animals</li> <li>• Carry out other specialist work, including flood rescue services</li> <li>• Where appropriate, assist people where the use of fire service personnel and equipment is relevant</li> </ul> <b>Ambulance Service</b> <ul style="list-style-type: none"> <li>• Save life</li> <li>• Provide treatment, stabilisation and care at the scene</li> </ul>	<b>Utility Providers</b> <ul style="list-style-type: none"> <li>• Attend emergencies relating to their services putting life at risk</li> <li>• Assess and manage risk of service failure</li> <li>• Assist with recovery process, that is, water utilities manage public health considerations</li> </ul> <b>Internal Drainage Board</b> <ul style="list-style-type: none"> <li>• Operate strategic assets to reduce flood risk in partnership with RMAs and public</li> </ul> <b>Town and Parish Councils</b> <ul style="list-style-type: none"> <li>• Support emergency responders</li> <li>• Increase community resilience through support of community emergency plan development</li> </ul> <b>Voluntary services</b> <ul style="list-style-type: none"> <li>• Support rest centres</li> <li>• Provide practical and emotional support to those affected</li> <li>• Support transport and communications</li> <li>• Provide administration</li> <li>• Provide telephone helpline support</li> </ul>
<b>Environment Agency</b> <ul style="list-style-type: none"> <li>• Issue Flood Warnings and ensure systems display current flooding information</li> <li>• Provide information to the public on what they can do before, during and after a flood event</li> <li>• Monitor river levels and flows</li> <li>• Work with professional Partners and stakeholders and respond to requests for flooding information and updates</li> <li>• Receive and record details of flooding and related information</li> <li>• Operate water level control structures within its jurisdiction and in line with permissive powers</li> <li>• Flood event data collection</li> <li>• Arrange and take part in flood event exercises</li> <li>• Respond to pollution incidents and advise on disposal</li> <li>• Assist with the recovery process, for example, by advising on the disposal of silt, attending flood surgeries</li> </ul>	

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## 5. Conclusions and Recommendations

### 5.1 Conclusions

The main issues that contributed towards the flooding on Hedgerley Lane were the extreme and prolonged rainfall experienced which increase the surface water runoff and the closure of the Thames Water Pyebush Lane Pumping Station. This combination caused the foul sewer on Hedgerley Lane to surcharge which flooded the lane with contaminated water. Although the flooding did not affect any properties internally, it was contaminated with sewerage and covered the road, making access to the cut off properties almost impossible, and posed an environmental and public health risk.

### 5.2 Recommendations

Some recommendations have been put forward and are summarised in table 2 below.

**Table 2** Recommendations

Authority/Stakeholder	Recommended Action
Thames Water	<ul style="list-style-type: none"> <li>• Share any reports or outcomes from the flood incident during winter 2013/14.</li> <li>• Produce a more efficient mitigation plan which will take into account the increased volumes due to groundwater.</li> <li>• To communicate with local residents/workers and RMAs more efficiently.</li> <li>• To look in to the recent and repeated flooding on Hedgerley Lane and report back to RMAs and local residents/worker.</li> </ul>
TfB	<ul style="list-style-type: none"> <li>• To investigate the need for highway drainage on Hedgerley Lane to assist in the removal of surface water.</li> </ul>
BCC	<ul style="list-style-type: none"> <li>• To facilitate sharing of information between RMAs and the community.</li> </ul>
SBDC	<ul style="list-style-type: none"> <li>• To facilitate sharing of information between RMAs and the community.</li> </ul>
Residents	<ul style="list-style-type: none"> <li>• Take measures to protect themselves and their property when flooding is imminent.</li> <li>• Continue to document and photograph flood incidents where possible and report flooding.</li> </ul>

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## Explanation of Acronyms

Acronym	Definition
<b>BCC</b>	Buckinghamshire County Council
<b>RMA</b> s	Risk Management Authorities
<b>LLFA</b>	Lead Local Flood Authority
<b>FWMA</b>	Flood and Water Management Act (2010)
<b>EA</b>	Environment Agency
<b>BFR</b>	Buckinghamshire Fire and Rescue
<b>SBDC</b>	South Bucks District Council
<b>BGS</b>	British Geological Survey
<b>STW</b>	Sewerage Treatment Works

## References

Reference in document	Refers to:
<b>BGS online map, 2014</b>	<a href="http://mapapps.bgs.ac.uk/geologyofbritain/home.html">http://mapapps.bgs.ac.uk/geologyofbritain/home.html</a>
<b>EA, 2014</b>	Environment Agency risk of flooding from surface water map - <a href="http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw&amp;scale=7&amp;ep=map&amp;layerGroups=default&amp;lang=_e&amp;y=181500&amp;x=531500#x=531500&amp;y=181500&amp;scale=7">http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw&amp;scale=7&amp;ep=map&amp;layerGroups=default&amp;lang=_e&amp;y=181500&amp;x=531500#x=531500&amp;y=181500&amp;scale=7</a>

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## Contacts

### Lead Local Flood Authority



Flood Management Team  
Buckinghamshire County Council  
County Hall  
Walton Street  
Aylesbury  
Bucks HP20 1UY

Telephone: 084537 08090

Email: [FloodManagement@buckscc.gov.uk](mailto:FloodManagement@buckscc.gov.uk)

Website: [www.buckscc.gov.uk/flooding](http://www.buckscc.gov.uk/flooding)

### Environment Agency



**Environment  
Agency**

National Customer Contact Centre  
PO Box 544  
Rotherham  
S60 1BY

Telephone: 03708 506506

Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

Website: <http://www.gov.uk/government/organisations/environment-agency>

### District Council



South Bucks District Council  
Capswood  
Oxford Road  
Denham  
Bucks UB94LH

**Opening times**  
Monday - Wednesday  
9am – 5.30pm  
Thursday - Friday  
9am – 5pm

Telephone: 01895 837200



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### **Highways Authority**

Transport for Buckinghamshire

Telephone: Transport and roads – 0845 2302882

Out of hours emergencies (Highways) – 01296 486630

Email: [ffb@buckscc.gov.uk](mailto:ffb@buckscc.gov.uk)

Website: <http://www.transportforbucks.net/Transport-and-roads.aspx>

### **Water Utility**



Thames Water

PO Box 286

Swindon

SN38 2RA

Telephone: 0845 9200 800

Website: <http://www.thameswater.co.uk/help-and-advice/16739.htm>

### **Emergency Response**

#### **Buckinghamshire Fire and Rescue Service**

Address: Buckinghamshire Fire & Rescue Service, Brigade HQ, Stocklake, Aylesbury, Bucks, HP20 1BD

Telephone: 01296 744400

Website: <http://www.bucksfire.gov.uk/BucksFire/Contact+Us/>

#### **Thames Valley Police**

Telephone: 101 in non-emergency, 999 in emergency

Website: <http://www.thamesvalley.police.uk/contactus-phone.htm>

#### **Buckinghamshire Ambulance Service**

Telephone: 111 in non-emergency, 999 in emergency

Website: <http://www.southcentralambulance.nhs.uk/content/press-release/buckinghamshire/flooding-advice.ashx>

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## Appendices

### Appendix A: BCC criteria for a Section 19 Investigation

- Internal flooding (including to basements) to five or more residential properties within an area of 1km<sup>2</sup>
- Internal flooding of two or more business premises within an area of 1km<sup>2</sup>
- Internal flooding (including to basement) of at least one property for one week or longer
- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.
- Caused a transport link to be impassable for the following periods:
  - Motorways, trunk roads and major rail links – 2 hours or more
  - Class A and B highways and other railway links – 4 hours or more
  - Class C highways – 10 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours
  - Class U highways – 24 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours
- Any flooding event that a risk management authority deems significant does not meet the agreed thresholds should be brought to the next strategic flood management committee for consideration.