



## Investigation Report into the Flooding in the Borough of King's Lynn and West Norfolk in 2014-2018

Report Reference: FIR033

Draft Report prepared by John Mellows on 25/07/2019



## Executive Summary

### (a) Flooding incidents and causes

Flooding occurred in Kings and West Norfolk District on numerous dates from 2014 to 2018. 32 properties were internally flooded with a total of 44 reported Incidents of internal flooding. The incidents of flooding occurred in the following parishes and at the following locations:

- **Burnham Market Area:**  
Overy Road.  
East Harbour Way & Tower Road, Burnham Overy.
- **Castle Acre:**  
Pyes Lane.
- **Hunstanton:**  
Le Strange Terrace; Nelson Drive; Southend Road.
- **Docking:**  
Fakenham Road.
- **Snettisham:**  
Common Road.
- **Kings Lynn Area:**  
Wootton Road; Page Stair Lane; Townshend Terrace, Rope Walk and Saltpans Close.  
Henry Bell Close, Gaywood.  
The Green, Priory Lane, North Wootton.
- **West Norfolk Area:**  
Lynn Road, Wiggenhall St Germans.  
The Alley, Blackborough End, Middleton.  
Bardolphs Way, Wormegay.
- **Marham:**  
The Street.
- **Downham Market Area:**  
London Road; Stonecross Industrial Estate.  
Main Road, Crimplesham.  
Ely Road, Denver.  
Church Road, Wereham.  
Stow Corner, Low Road, Stowbridge.
- **Upwell:**  
Croft Road.

Some of the most prevalent causes are summarised below:

Drainage Issues:

- Overloading of the Drainage System
- Surcharging of the drainage system;
- Drainage system or outfall blockage, unmaintained or obstructed;

Other causes

- Increased run-off due to impermeable surfaces & saturation of soil
- Entry of flood water into property through low thresholds at entrances.
- Surface run-off from roads
- Surface water washed off public highway by vehicles.

**(b) Key recommendations**

The recommendations set out in the report have been summarised below. Specific recommendations for each individual area are set out within the report. Please note a number of these recommendations have already been followed up by the respective organisations identified. Progress against these some of these recommendations has been assessed and reported as part of an '*Borough of King's Lynn and West Norfolk 2014-2018 - FRO33/A*' which can be found at [Norfolk Flood Investigations](#) .

**Risk Management Authorities** should;

- Communicate with affected residents where their assets have given rise to the flooding of Review the appropriateness of their response to flooding.
- Determine the integrity and/or capacity of their assets and their maintenance where they have contributed to the flooding of properties to understand the systems role in accommodating rainfall events as well as mitigating flooding.

**Property owners** of affected properties should;

- Confirm the integrity, capacity and appropriateness of their property drainage
- Determine if works are needed to remove the risk posed by structures that form obstructions to flows.
- Determine if it is appropriate for them to protect their buildings through flood protection measures.
- Seek their own legal advice if they are concerned about the responsibilities and liabilities of themselves and/or others.
- All property owners should remove any inappropriate surface water connections to the foul sewer system and direct flows to alternative points of discharge where it doesn't increase flood risk.

**Norfolk County Council** should;

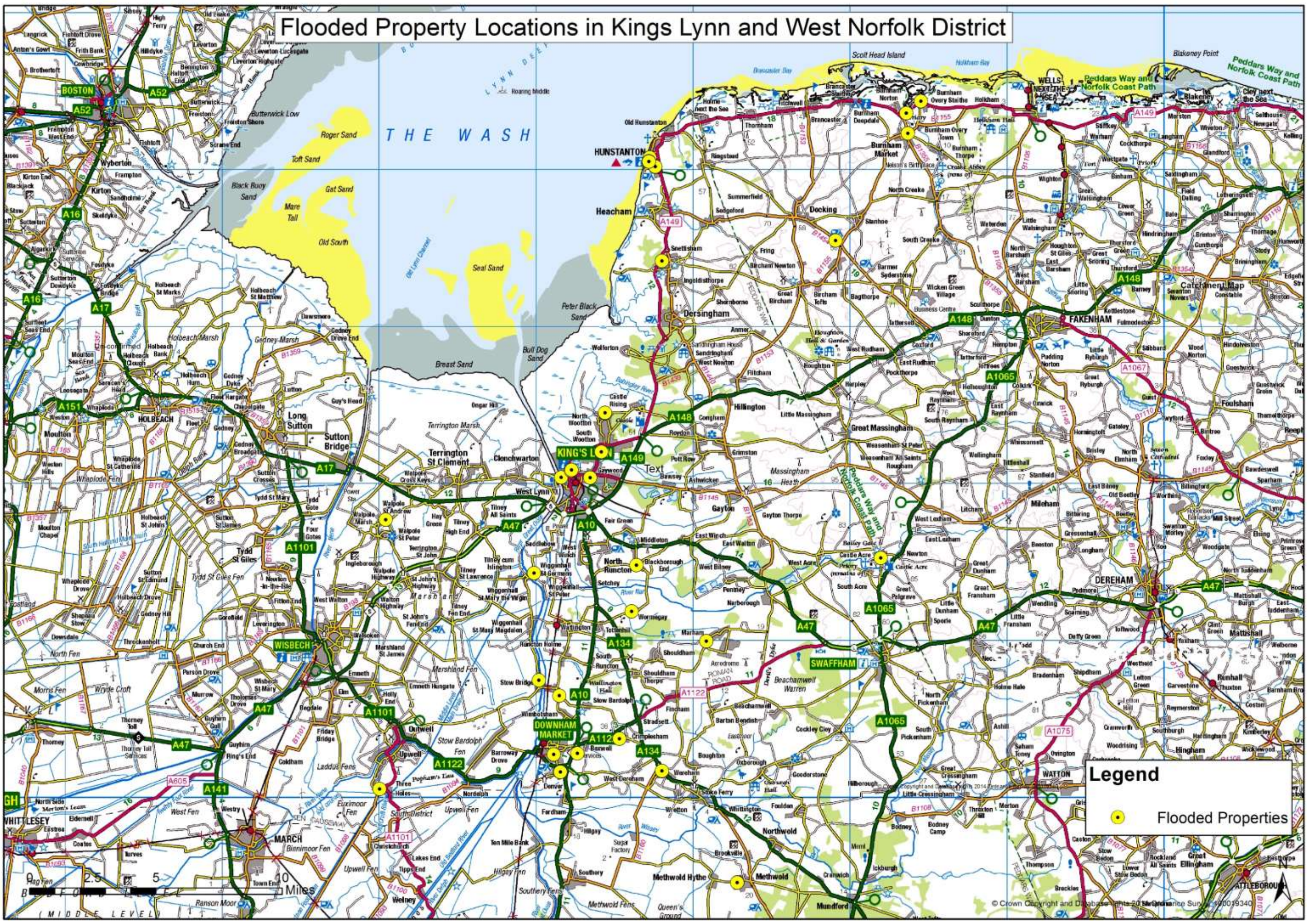
- Work with partner organisations to identify funding for flood mitigation. This would include assessing the potential to install property level protection measures, reduce run-off and increase the attenuation of flood water to reduce the impacts of flooding.

- Work with property owners to consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable.
- Seek to remind riparian owners of their responsibility to undertake appropriate levels of maintenance to sustain the efficiency of the drainage systems.
- Communicate with local residents to advise them of the appropriate measures they could take to protect their property without prejudicing the rights and responsibilities of adjoining property holders
- Determine if works are needed to remove the risk posed by structures that form obstructions to watercourse flows and communicate with affected parties and riparian owners
- Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

**Anglian Water** should;

- Work with partner organisations to identify the potential for managing the amount of surface water entering their drainage system in flood events.

# Flooded Property Locations in Kings Lynn and West Norfolk District



**Legend**  
● Flooded Properties

## **Justification for Flood Investigation**

The purpose of this report relates to Section 19 of the Flood and Water Management Act 2010. This legislation sets out that the County Council, in its role as LLFA for Norfolk, should investigate the role and response of organisations to significant flooding incidents. Significant flooding is deemed to be those incidents that impact upon people, property and infrastructure.

The Norfolk Local Flood Risk Management Strategy Policy UC2 (Flood Investigation) sets out the thresholds NCC will apply to its formal flood investigation role. This states an investigation will be undertaken where it is determined that;

- (a) There is ambiguity surrounding the source or responsibility for a flood incident, and/or;
- (b) There is cause to investigate the flood incident, due to either its impact, or consequence

In judging the impact or consequence of a flood event Norfolk County Council uses the criteria set out below;

- Any risk to loss of life or serious injury.
- One or more residential or business property flooded internally.
- One or more critical services/installations and vulnerable person's properties flooded internally; and/or rendered inoperable or their functions severely compromised due to the access to the premises being impassable; and/or resulting in a loss of service impacting on the local community.
- Any section of a national category 3 road or above made impassable due to flooding; and/or flooding to priority 1 and 2 gritting routes.
- Flooding adversely impacting a rail link by making it impassable.

It was deemed necessary to complete a formal Investigation Report into the Flooding in King's Lynn Borough in 2014-2018 as:

- Multiple residential properties were internally flooded.
- One commercial property was internally flooded.

This impact met Norfolk County Council's threshold for triggering the undertaking of a formal flood investigation.

The flood investigation report aims to:

- Provide a transparent and consistent review of recent flooding.
- Identify those organisations and individuals who have responsibility to manage the causes of the flooding.
- Identify what their response has been or will be to the flooding.
- Make recommendations as to how the flood risk could be mitigated or reduced.
- Provide new evidence of the level of risk faced by communities in Norfolk that can be used in current funding bids in support of flood mitigation schemes.

Mitigation measures include property level protection: reinstating lost drainage features: reviewing or increasing maintenance regimes and increasing the capacity of the drainage network.

The flood investigation report cannot:

- Resolve the flooding issues or provide designed solutions.
- Force authorities to undertake any of the recommended actions.

## Flooding in the Burnham Market Area

### Description of area

Overy Road, Burnham Market. Tower Road and East Harbour Way in Burnham Overy. Area is coastal with river and marsh.

### Flood incidents within this area

Within this area 3 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/06/2016	On the 23/06/2016 - 1 property was internally flooded on Overy Road, Burnham Market. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 16 September 2016, (FWF/16/2/3998)	NCC visited affected residents to offer advice and to gather information after the incident.
19/02/2015	On the 19/02/2015 - 1 property was internally flooded on East Harbour Way, Burnham Overy. This incident was reported by a resident via an online flood report form on the 19 February 2015, (FWF/15/2/1262)	NCC visited affected residents to offer advice and to gather information after the incident.
01/09/2014	On the 01/09/2014 - 1 property was internally flooded on Tower Road, Burnham Overy. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 22 October 2014, (FWF/14/2/0921)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.

### Recent rainfall within the area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5 km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

1 of the incidents (25%) of internal flooding in this area are within 2.5km of a rain gauge. The rainfall events recorded by gauges for this area;

23 June 2016 - 20mm rainfall was recorded as falling in 6 hours 0 minutes at the Burnham Overy rainfall monitoring station. This intensity of rainfall for the total duration equates to a 1.43 year rainfall event.

## Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.



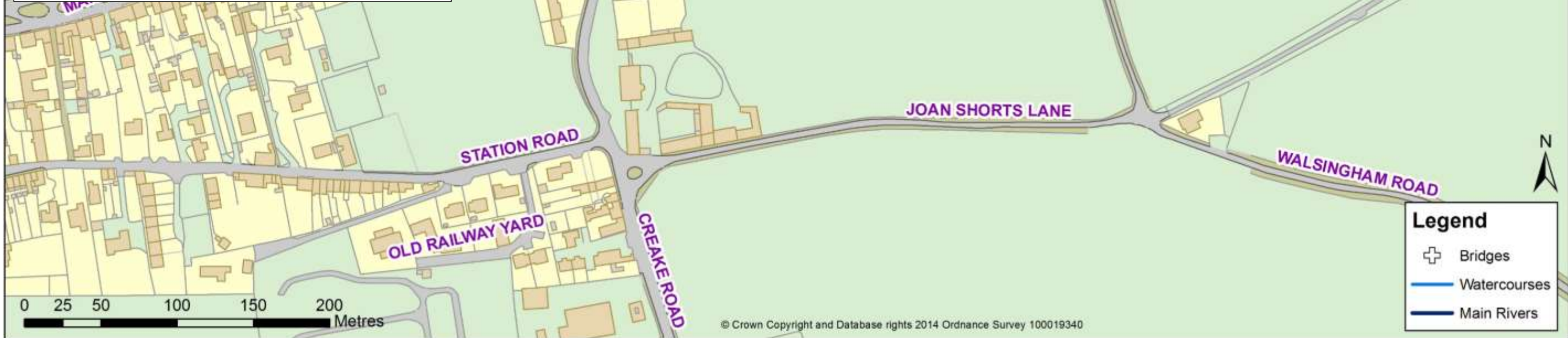
# Flooding on Overy Road, Burnham Market

**Overy Road** - Internal and external flooding experienced on 23/06/2016

**Causes** - Water was directed from a neighbouring property by their roof drainage towards the affected property. Surface run-off from rainfall that had made its way onto the highway and then flowed over the dropped kerb and entered the property through the low threshold at the entrance.

**Recommendations** - Norfolk County Council would consider an application from the property owner to raise the kerb outside of the property in order to route flood water on the highway away from the affected properties.

The property owners should protect their building through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.



## Flooding on Tower Road and East Harbour Way, Burnham Overy

**Tower Road** – Internal and external flooding experienced on 01/09/2014

*Causes* - Surface run-off from rainfall that had made its way onto the highway and then flowed towards the access of the property. A blockage and insufficient capacity of highway surface water drain contributed to the flooding. Rainfall was directed into the surface water system causing it to surcharge elsewhere. The flood water entered through low thresholds at entrances.

*Recommendations* - Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable. The property owner should protect their building through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.

**East Harbour Way** – Repeated internal and external flooding experienced.

*Causes* - Runoff from adjacent footpath contributes to water entering through the front door during heavy rainfall.

*Recommendations* - The property owner should protect their building through flood protection measures where appropriate, and take note of flood warnings and take appropriate action.



## Flooding in Castle Acre

### Description of Area

Pyes Lane, Castle Acre. Village in a hilly area with a watercourse nearby.

### Flood incidents within this area

Within this area 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
18/05/2014	On the 18/05/2014 - 1 property was internally flooded on Pyes Lane, Castle Acre. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 18 May 2014, (FWF/14/2/0289)	NCC visited affected residents to offer advice and to gather information after the incident.
20/06/2015	On the 20/06/2015 - 1 property was internally flooded on Pyes Lane, Castle Acre. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 28 June 2015, (FWF/15/2/0626)	Norfolk County Council (Highways) visited affected residents to offer advice and to gather information after the incident.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

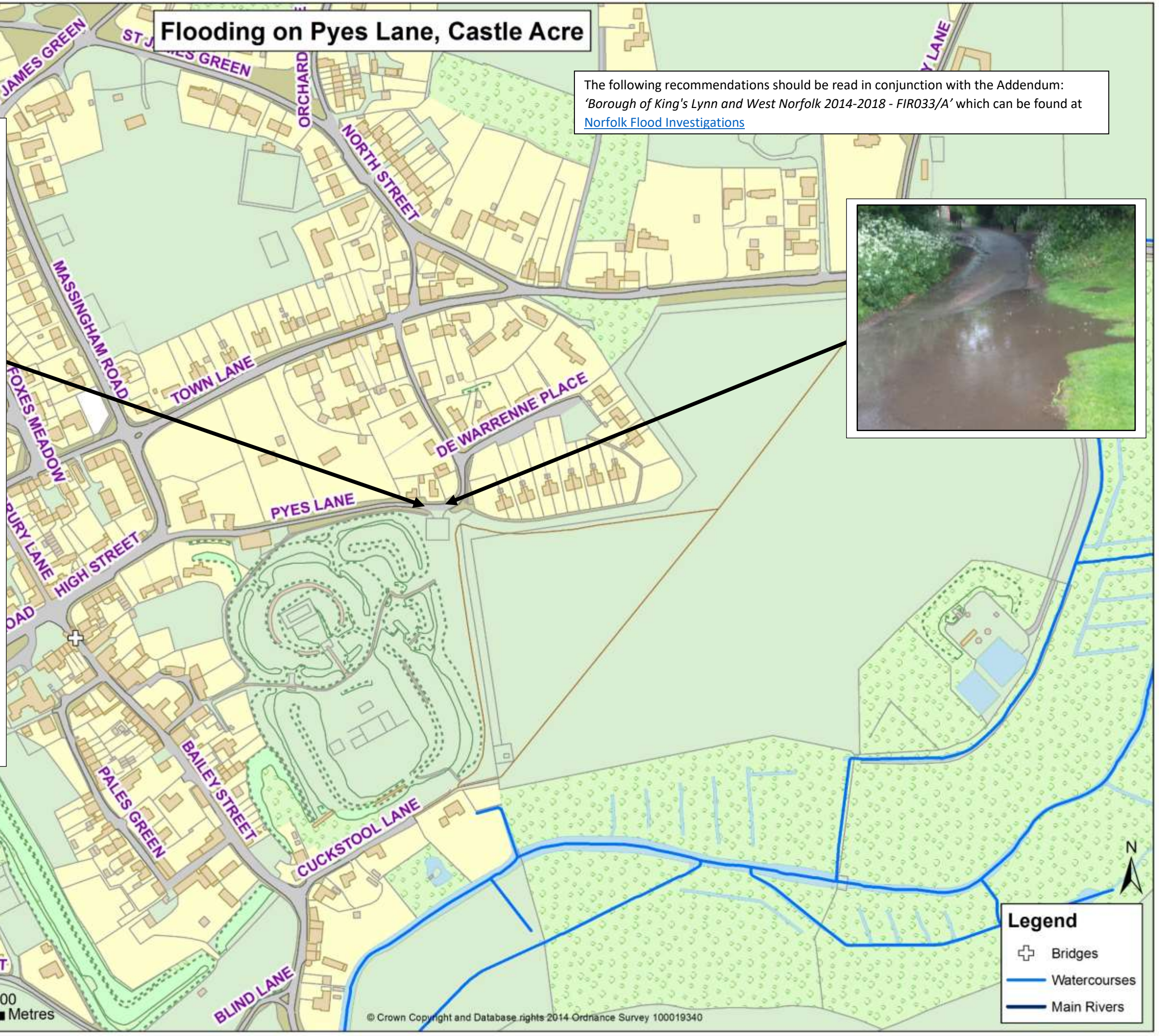
# Flooding on Pyes Lane, Castle Acre

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Pyes Lane** – Internal and external flooding experienced on 18/05/2014, 20/06/2015

*Causes* – Surface run-off from rainfall made its way onto the highway and pooled at a low point and flowed onto the accesses of the affected property situated lower than the highway. Water entered the property through low thresholds at entrances.

*Recommendations* - Norfolk County Council will consider opportunities to route flood water on the highway away from the affected property. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property. NCC will lead on developing a partnership funding solution to mitigate the risk experienced at this location.



## **Flooding in Hunstanton**

### Description of area

Le Strange Terrace, Southend Road and Nelson Drive, Hunstanton. Coastal urban area.

### Flood incidents within this area

Within this area 11 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports

Date of Incident	Incident as reported	What was the response to the flood incident(s)
03/08/2018	On the 03/08/2018 - 2 properties was internally flooded on Nelson Drive, Hunstanton. This incident was reported by a District Councillor via email correspondence on the 3 August 2018, (FWF/18/2/6959) & (FWF/18/1198)	The Borough Council of King's Lynn and West Norfolk visited affected residents to offer advice and to gather information after the incident and worked together as part of a multi-agency group to co-ordinate their response to the flooding after the incident. Norfolk County Council (Highways & LLFA) visited affected residents to offer advice and to gather information after the incident.
27/07/2018	On the 27/07/2018 - 2 property were internally flooded on Nelson Drive, Hunstanton. This incident was reported by Norfolk County Council (Highways) via email correspondence on the 7 August 2018, (FWF/18/2/6950) & (FWF/18/1199)	
27/08/2016	On the 27/08/2016 - 2 property were internally flooded on Nelson Drive, Hunstanton. This incident was reported by a Borough Councillor via email correspondence on the 23 March 2017, (FWF/16/2/3333) & (FWF/17/2/4450)	
07/01/2016	On the 07/01/2016 - 1 property was internally flooded on Le Strange Terrace, Hunstanton. This incident was reported by a District Councillor via email correspondence on the 2 February 2016, (FWF/16/2/2340)	NCC visited affected residents to offer advice and to gather information after the incident.
14/08/2014	On the 14/08/2014 – 1 property was internally flooded on Southend Road, Hunstanton. This incident was reported by: a resident via a flood questionnaire on the 12 January 2015 the Fire and Rescue Service via an electronic report on the 14 August 2014, (FWF/14/2/1209)	The Fire and Rescue Service responded and pumped out during the incident. Norfolk County Council (Highways) carried out works to maintain and increase the capacity of the drainage system. The system was jetted and the surface water pipe was replaced. NCC visited affected residents to offer advice and to gather information after the incident.

# Flooding in Hunstanton

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Le Strange Terrace** – Internal and external flooding experienced on 07/01/2016

*Causes* - The flood water entered the property through low thresholds at the entrance.

*Recommendations* - Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.

**Nelson Drive** – Internal and external flooding experienced on 03/08/2018 and 27/07/2018

*Causes* - Run-off from rainfall was concentrated along overland flowpaths on which the affected properties are positioned. Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.

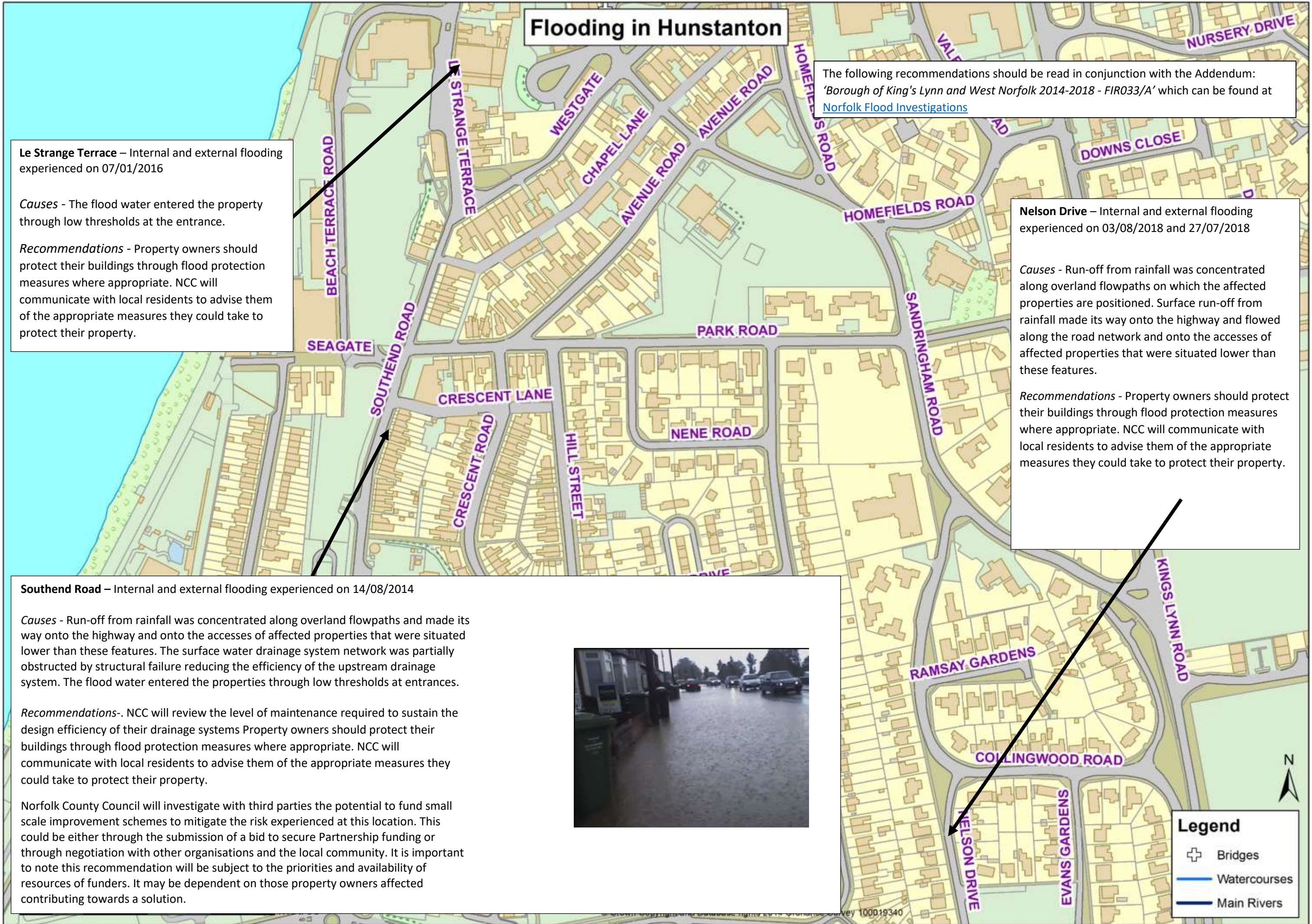
*Recommendations* - Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.

**Southend Road** – Internal and external flooding experienced on 14/08/2014

*Causes* - Run-off from rainfall was concentrated along overland flowpaths and made its way onto the highway and onto the accesses of affected properties that were situated lower than these features. The surface water drainage system network was partially obstructed by structural failure reducing the efficiency of the upstream drainage system. The flood water entered the properties through low thresholds at entrances.

*Recommendations* - NCC will review the level of maintenance required to sustain the design efficiency of their drainage systems. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.

Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. This could be either through the submission of a bid to secure Partnership funding or through negotiation with other organisations and the local community. It is important to note this recommendation will be subject to the priorities and availability of resources of funders. It may be dependent on those property owners affected contributing towards a solution.



## **Flooding in the Docking Area**

### Description of area

Rural B Road, mostly farmland and some business nearby.

### Flood incidents within this area

Within this area 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

<b>Date of Incident</b>	<b>Incident as reported</b>	<b>What was the response to the flood incident</b>
04/02/2018	On the 04/02/2018 - 1 property was internally flooded on Fakenham Road, Docking. This incident was reported by Norfolk County Council (Highways) via email correspondence on the 9 February 2018, (FWF/18/2/6097)	Norfolk County Council (Highways) cleaned out the highway gullies and carried out maintenance to the associated ditch.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment ("PFRA").
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation report



# Flooding on Fakenham Road, Docking

Fakenham Road – external flooding experienced on 04/02/2018

*Causes* – Surface water pooling on adjacent farmland due to rainfall and frozen ground conditions, reducing infiltration. Water flowed onto highway, where existing surface water drainage were unable to cope with water due to insufficient capacity &/or blockage.

*Recommendations* – NCC to review maintenance requirements of the drainage system.  
Landowners to address issues with surface water pooling and flow from farmland onto highway.



The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

0 25 50 100 150 200 Metres

## Legend

- ⊕ Bridges
- Watercourses
- Main Rivers

## Flooding in the Snettisham area

### Description of area

Common Road, Snettisham. Rural village with numerous drainage ditches. Woodland and hills nearby.

### Flood incidents within this area

Within this area 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incidents
27/07/2018	On the 28/07/2018 - 2 properties were internally flooded on Common Road, Snettisham. This incident was reported by Anglian Water via email correspondence on the 31/07/2018, (FWF/18/2/6906) & (FWF/18/2/6907)	NCC Highways Out of Hours service visited affected residents to offer advice and to gather information after the incident.  Anglian Water Services Ltd visited affected residents to offer advice and to gather information during the incident.
23/06/2016	On the 23/06/2016 - 1 property was internally flooded on Common Road, Snettisham. This incident was reported by a resident via email correspondence on the 23 June 2016, (FWF/16/2/3328)	NCC worked together as part of a multi-agency group to co-ordinate their response to the flooding after the incident.
15/06/2016	On the 15/06/2016 - 1 property was internally flooded on Common Road, Snettisham. This incident was reported by a resident via email correspondence on the 15 June 2016, (FWF/16/2/2758)	NCC assessed the capacity of their drainage system after the incident and increased the capacity of the surface water system serving the highway.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area. We note that on the 23<sup>rd</sup> June 2016 over 190 properties were internally flooded across Norfolk indicating significant rainfall events during the course of this date.

### Historic flooding incidents within the catchment

The following table lists flooding incidents within the location that have been recorded:

Date of incident	Impact	Rainfall intensity
10/08/2015	Internal flooding to property	Unknown
07/05/2015	External flooding to property	Unknown
07/07/2015	External flooding to property	Unknown
04/07/2015	External flooding to property	Unknown
25/08/2012	Internal flooding to property	Unknown
June 2009	Internal flooding to property	Unknown

## Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

# Flooding on Common Road, Snettisham

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Common Road**— Internal and external flooding experienced on 15/06/2016 and 23/06/2016

*Causes* - Run-off from rainfall was concentrated along overland flow paths on which the affected property is positioned. Rainfall was directed into the foul system causing it to surcharge elsewhere. Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses the affected properties situated lower than the road. The flood water entered the property through low thresholds at entrances.

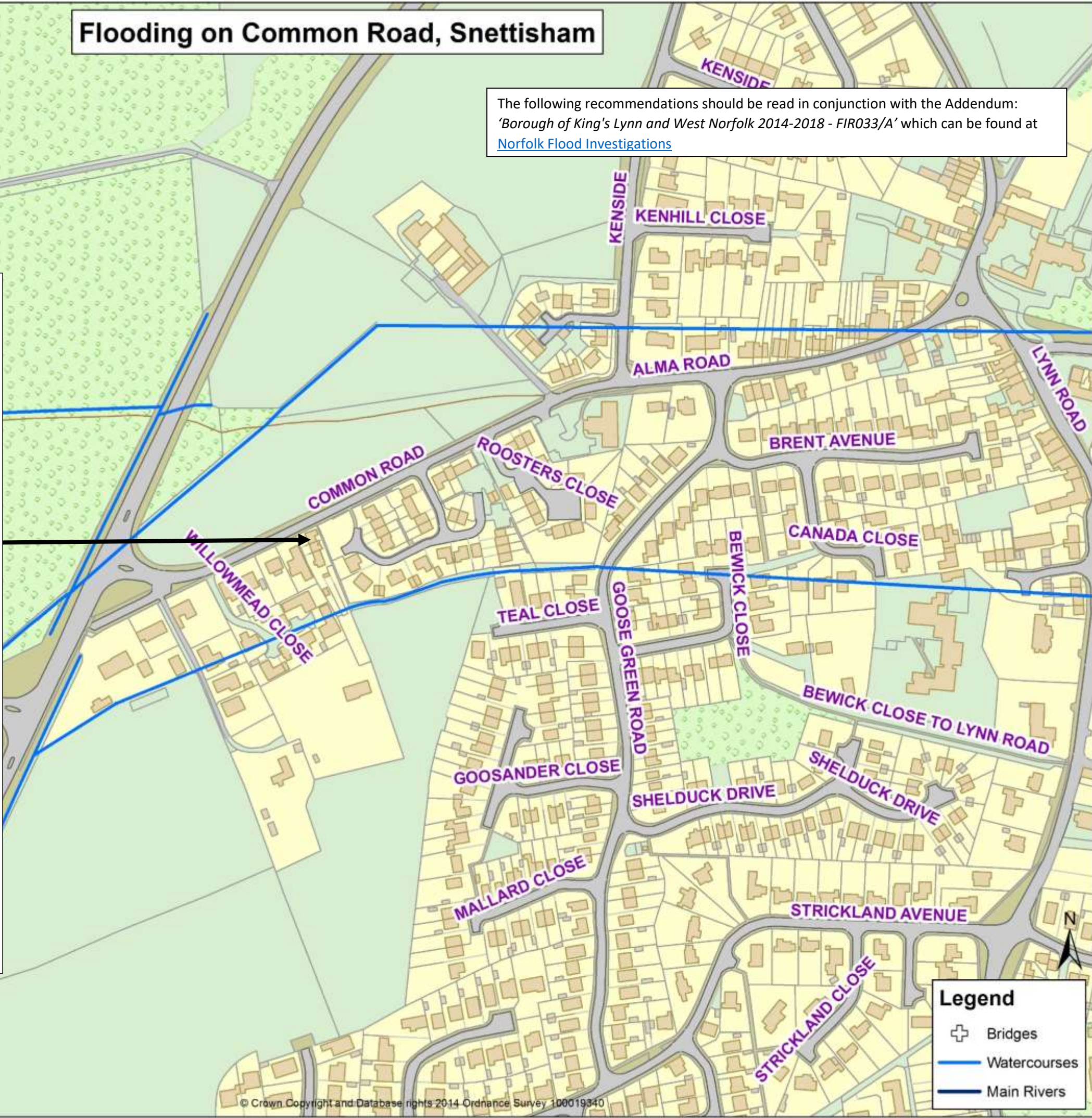
*Recommendations* –

NCC and Anglian Water should establish responsibility for the drainage system serving the affected property. This will ensure that maintenance and any future works identified are undertaken by the relevant organisation.

NCC will work with partner organisations to identify funding solutions to mitigate the risk experienced at this location. This could be either through submission of a bid to secure Partnership funding or through negotiation with other organisations and the local community. It is important to note this recommendation will be subject to the priorities and availability of resources of funders. It may be dependent on those property owners affected contributing towards a solution.

Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable. This could include a range of mechanisms both within the existing drainage system as well as private property.

Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their buildings.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

## Flooding in the Kings Lynn area

### Description of area

Kings Lynn: Allendale, Rope Walk, Townshend Terrace, Saltpans Close, Page Stair Lane, Wootton Road,

North Wootton: The Green, Priory Lane

Gaywood: Henry Bell Close

Mixture of urban and rural with a main river and other watercourses nearby.

Date of Incident	Incident as reported	What was the response to the flood incident
27/07/2018 & 29/07/2017	<p>On the 27/07/2018 - 1 property was internally flooded on The Green, Priory Lane, North Wootton. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 23 August 2018, (FWF/18/2/7042)</p> <p>On the 29/07/2017 - 1 property was internally flooded on The Green, North Wootton. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 1 August 2017, (FWF/17/2/5192)</p>	<p>Norfolk County Council (Highways) visited affected residents to offer advice and to gather information after the incident.</p> <p>NCC assessed the capacity of their drainage system after the incident.</p> <p>Anglian Water Services Ltd visited affected residents to offer advice and to gather information during the incident.</p> <p>The Fire and Rescue Service responded and pumped out during the incident.</p>
26/12/2017	<p>On the 26/12/2017 - 1 property was internally flooded on Rope Walk, Kings Lynn. This incident was reported by the Borough Council of King's Lynn and West Norfolk via email correspondence on the 3 January 2018, (FWF/18/2/5872)</p>	<p>NCC visited affected residents to offer advice and to gather information after the incident.</p> <p>NCC and the Environment Agency worked together as part of a multi-agency group to co-ordinate their response to the flooding after the incident.</p>
09/08/2017	<p>On the 09/08/2017 – Wootton Road was flooded. This incident was reported by a resident on the 09/08/2017 (FWF/17/2/5301)</p>	<p>Norfolk County Council assessed validity and impact of the flood report</p>
18/01/2016	<p>On the 18/01/2016 - 1 property was internally flooded on Page Stair Lane, Kings Lynn. This incident was reported by a resident via a telephone call on the 18 January 2016, (FWF/16/2/2282)</p>	<p>NCC visited affected residents to offer advice and to gather information after the incident.</p> <p>Anglian Water Services Ltd visited affected residents to offer advice and to gather information after the incident.</p> <p>Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.</p>

		Anglian Water Services Ltd & Norfolk County Council (Highways) assessed the condition of their systems.
16/09/2015	On the 16/09/2015 - 1 property was internally flooded on Henry Bell Close, Gaywood. This incident was reported by Anglian Water Services Ltd via an electronic report on the 22 September 2015, (FWF/15/2/1926)	NCC visited affected residents to offer advice and to gather information after the incident. Anglian Water Services Ltd responded and pumped out after the incident. Anglian Water cleared the sewer system of Fat's, Oil and Grease. Anglian Water installed Non-Return Valves at the location of the properties.
16/09/2015	On the 16/09/2015 - 1 property was internally flooded on Henry Bell Close, Gaywood. This incident was reported by Anglian Water Services Ltd via an electronic report on the 22 September 2015, (FWF/15/2/1925)	Anglian Water communicated with residents and businesses with regards to depositing Fat's, Oil and Grease into the sewer. Anglian Water Services Ltd responded and pumped out after the incident.

#### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

#### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment ("PFRA").
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

# Flooding between Rope walk, Saltpans Close and Townsend Terrace, Kings Lynn

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

## Townshend Terrace, Rope walk & Saltpans Close– Internal and external flooding experienced on 26/12/2017

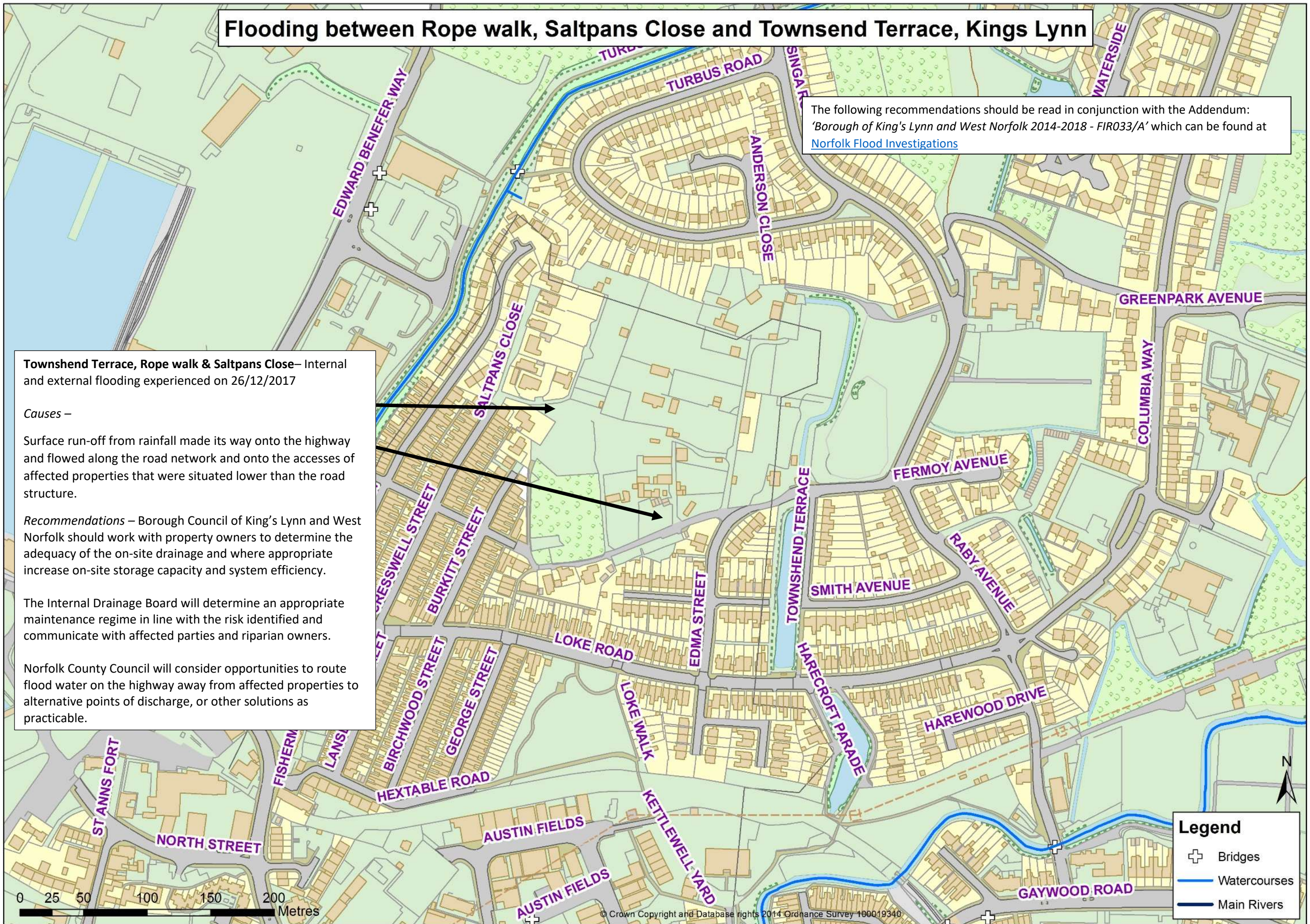
### Causes –

Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than the road structure.

**Recommendations –** Borough Council of King's Lynn and West Norfolk should work with property owners to determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.

The Internal Drainage Board will determine an appropriate maintenance regime in line with the risk identified and communicate with affected parties and riparian owners.

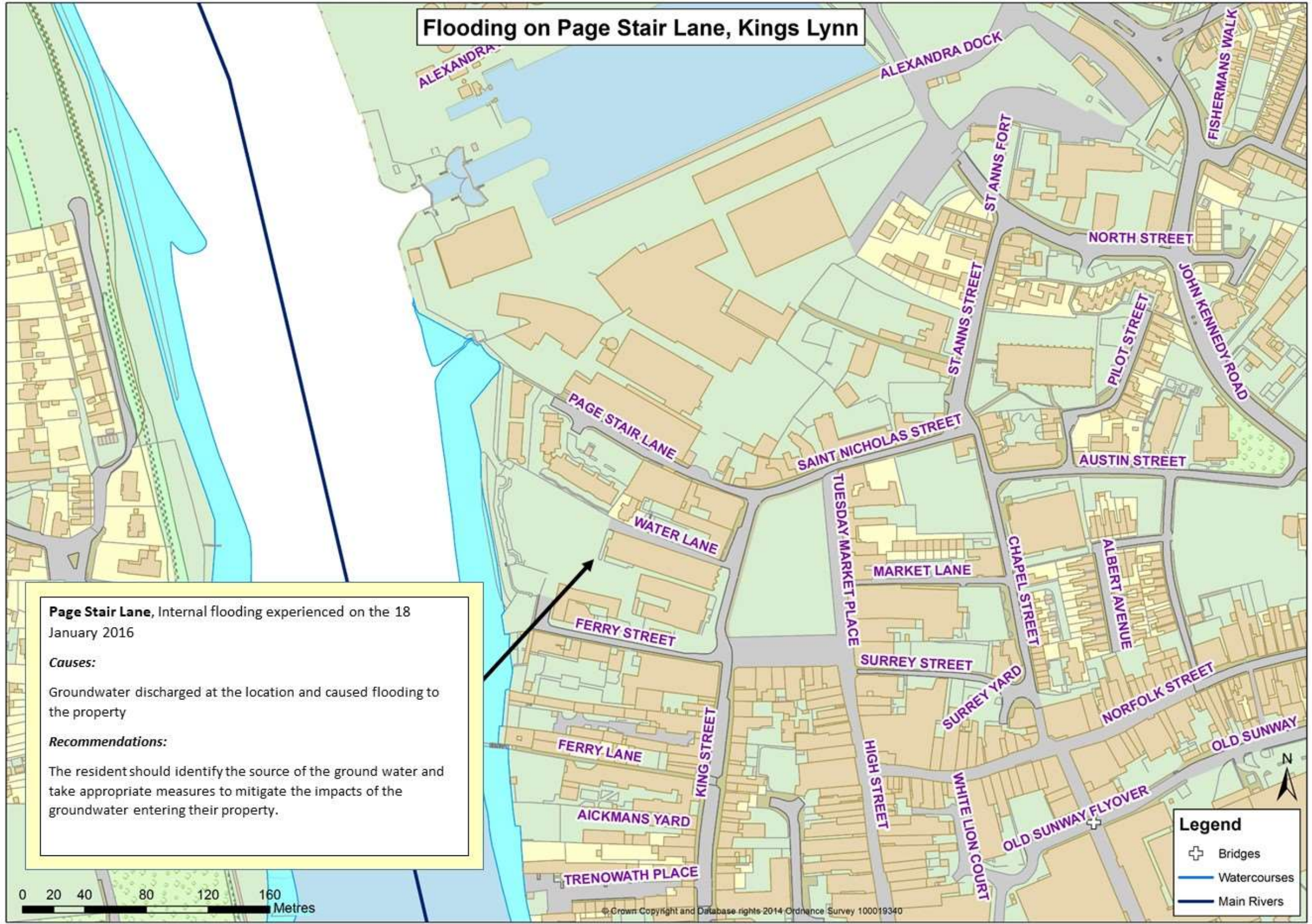
Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable.



# Flooding on Page Stair Lane, Kings Lynn

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

# Flooding on Page Stair Lane, Kings Lynn



**Page Stair Lane**  
 January 2016  
**Causes:**  
 Groundwater  
 the property  
**Recommendations:**  
 The resident  
 take appropriate  
 groundwater

**Page Stair Lane**, Internal flooding experienced on the 18 January 2016  
**Causes:**  
 Groundwater discharged at the location and caused flooding to the property  
**Recommendations:**  
 The resident should identify the source of the ground water and take appropriate measures to mitigate the impacts of the groundwater entering their property.

**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers



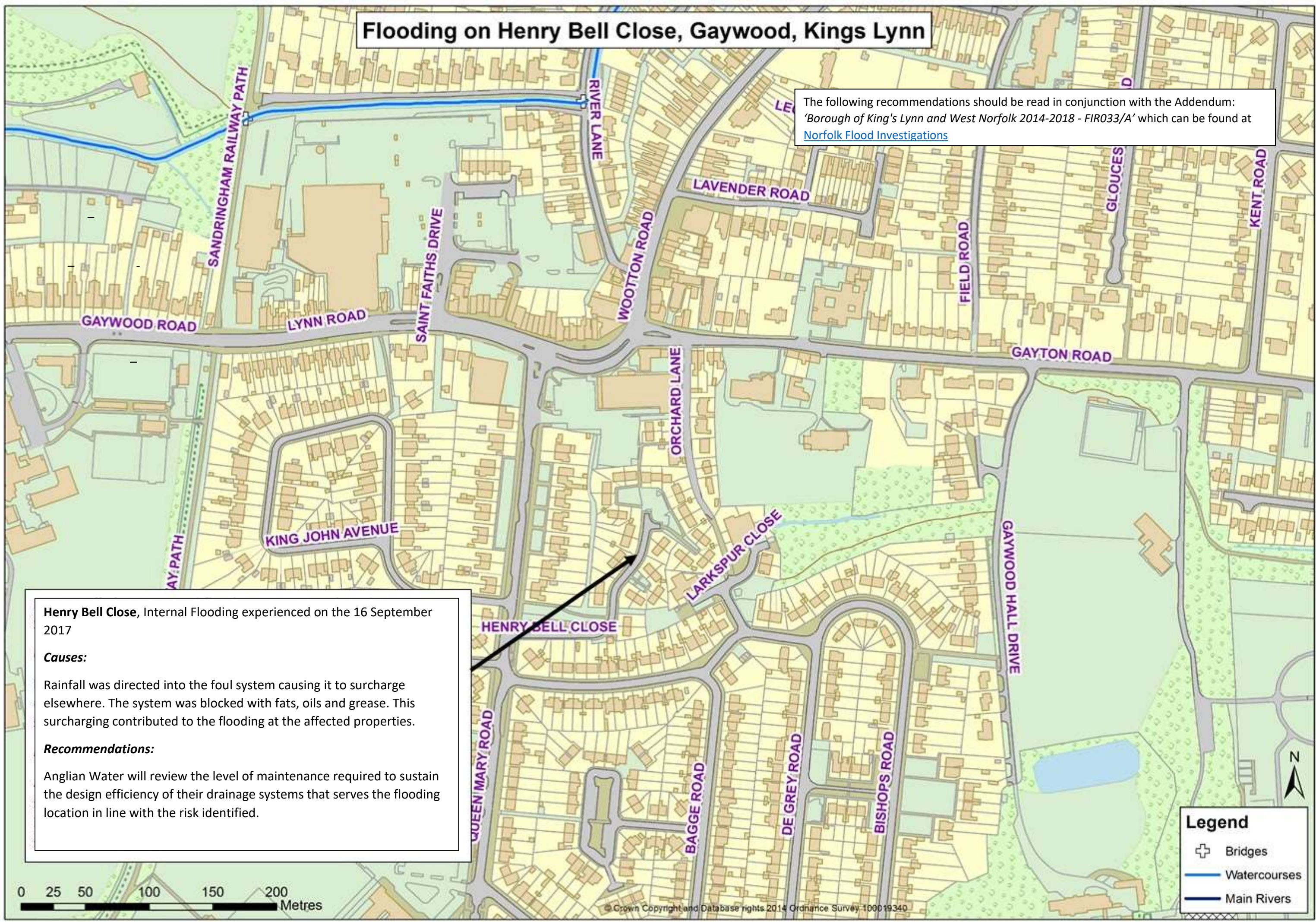
# Flooding on Henry Bell Close, Gaywood, Kings Lynn

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Henry Bell Close, Internal Flooding experienced on the 16 September 2017**

**Causes:**  
Rainfall was directed into the foul system causing it to surcharge elsewhere. The system was blocked with fats, oils and grease. This surcharging contributed to the flooding at the affected properties.

**Recommendations:**  
Anglian Water will review the level of maintenance required to sustain the design efficiency of their drainage systems that serves the flooding location in line with the risk identified.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

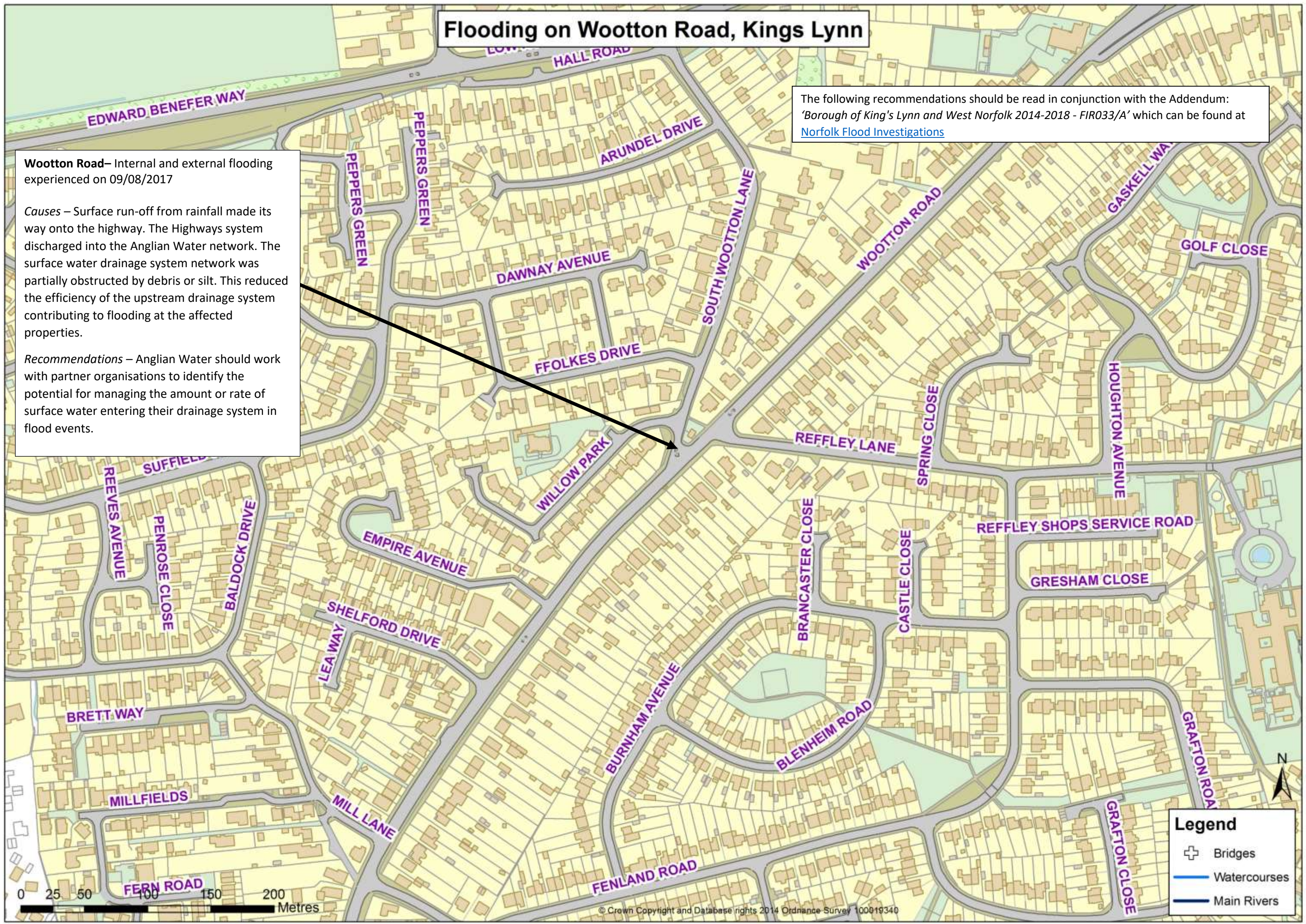
# Flooding on Wootton Road, Kings Lynn

**Wootton Road**– Internal and external flooding experienced on 09/08/2017

*Causes* – Surface run-off from rainfall made its way onto the highway. The Highways system discharged into the Anglian Water network. The surface water drainage system network was partially obstructed by debris or silt. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.

*Recommendations* – Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events.

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)



## Flooding in the West Norfolk area

### Description of area

Bardolphs Way, Wormegay; The Alley, Blackborough End, Middleton; Lynn Road, Wiggshall St Germans. Low lying rural area, with mixture of agriculture, fenland and woodland. Main river and other watercourses nearby.

### Flood incidents within this area

Within this area 3 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
09/08/2017	On the 09/08/2017 - 1 property was internally flooded on Bardolphs Way, Wormegay. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 10 August 2017, (FWF/17/2/5149)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.
28/06/2017	On the 28/06/2017 - 1 property was internally flooded on Lynn Road, Wiggshall St Germans. This incident was reported by Anglian Water Services Ltd via an electronic report on the 6 July 2017, (FWF/17/2/4906)	NCC have assessed the validity and impact of the flood report
27/12/2014	On the 27/12/2014 - 1 property was internally flooded on The Alley, Blackborough End, Middleton. This incident was reported by the Fire and Rescue Service via an electronic report on the 11 January 2015, (FWF/14/2/1418)	The Fire and Rescue Service responded and pumped out during the incident. NCC visited affected residents to offer advice and to gather information after the incident. NCC identified the need to renew the existing drainage scheme that serves the flooding location after the incident. The neighbouring landowner reinstated the watercourse serving the location following enforcement action undertaken by Norfolk County Council.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

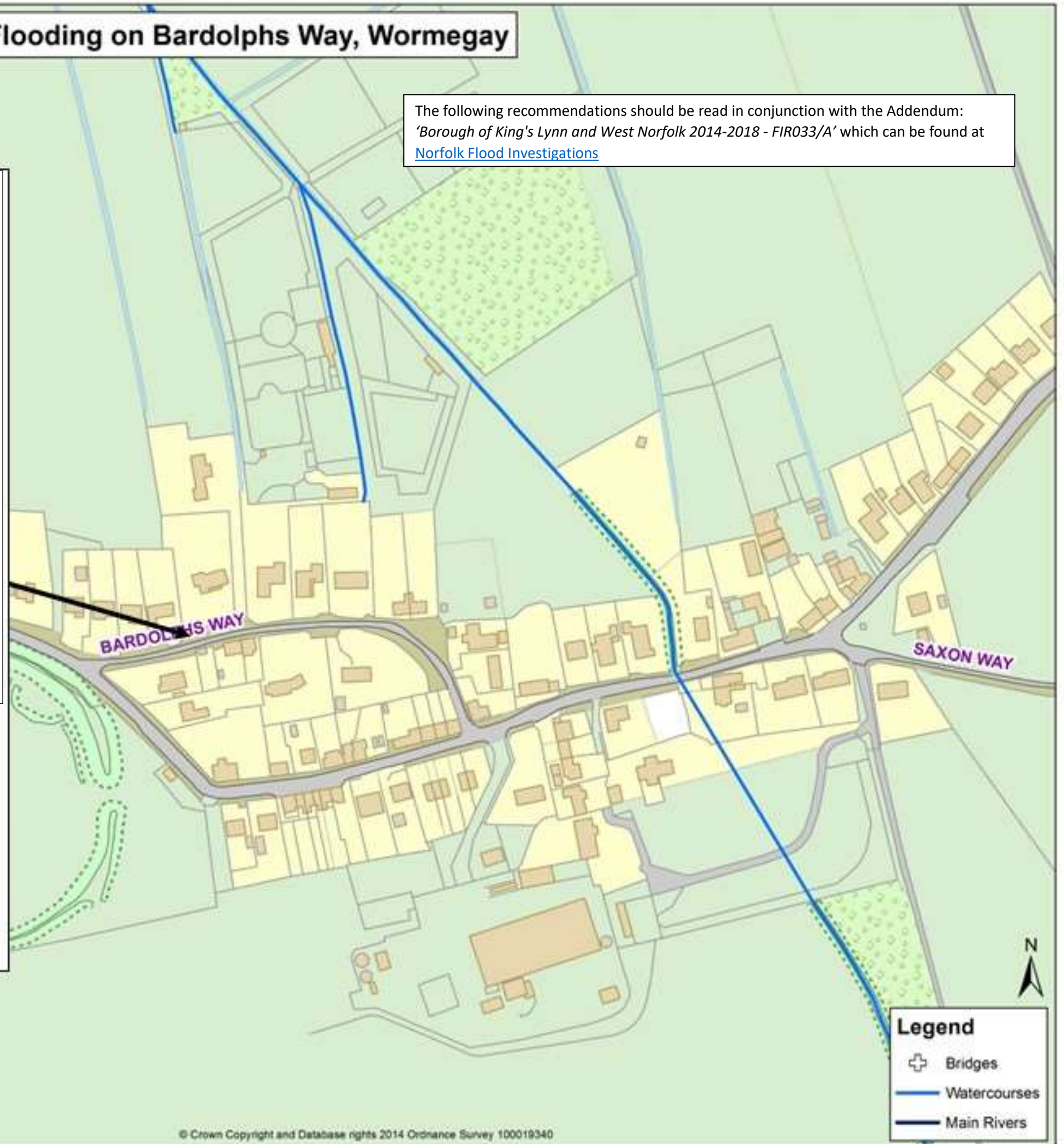
## Flooding on Bardolphs Way, Wormegay

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

### Bardolphs Way – Internal flooding experienced on 09/08/2017

**Causes** - Surface run-off from rainfall made its way onto the highway and flowed onto the access of the property, which contributed to the flooding of the affected property. The watercourse serving the location was blocked by debris or silt. This reduced the efficiency of the drainage system contributing to flooding at the affected properties. Rainfall was directed into the surface water system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected properties.

**Recommendations** - Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable. NCC will review the level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. Riparian owners should review the level of maintenance required to sustain the design efficiency of the riparian drainage systems that serve the flooding location in line with the risk identified. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property without prejudicing the rights and responsibilities of adjoining property holders.



0 20 40 80 120 160 Metres

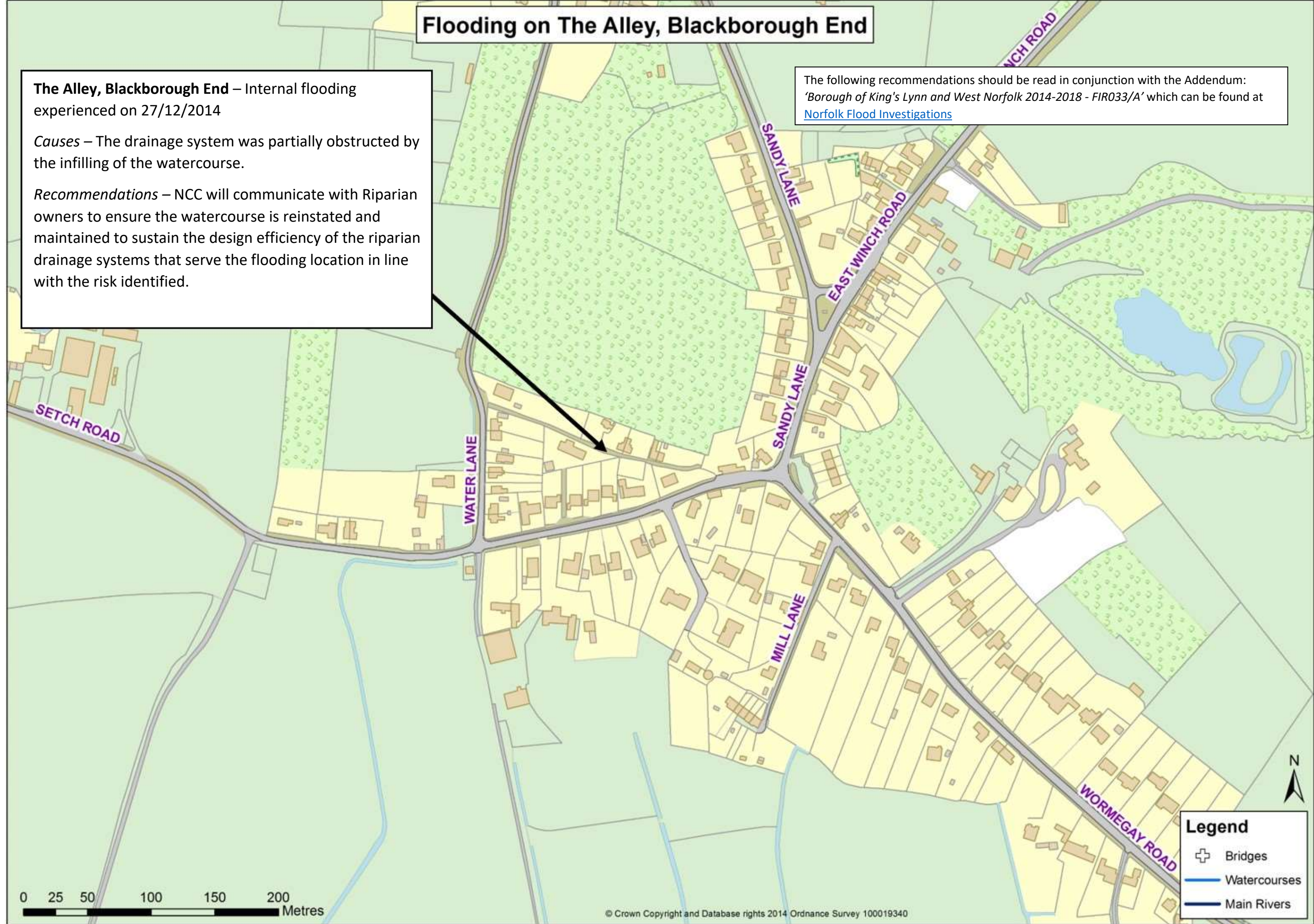
# Flooding on The Alley, Blackborough End

**The Alley, Blackborough End** – Internal flooding experienced on 27/12/2014

*Causes* – The drainage system was partially obstructed by the infilling of the watercourse.

*Recommendations* – NCC will communicate with Riparian owners to ensure the watercourse is reinstated and maintained to sustain the design efficiency of the riparian drainage systems that serve the flooding location in line with the risk identified.

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)



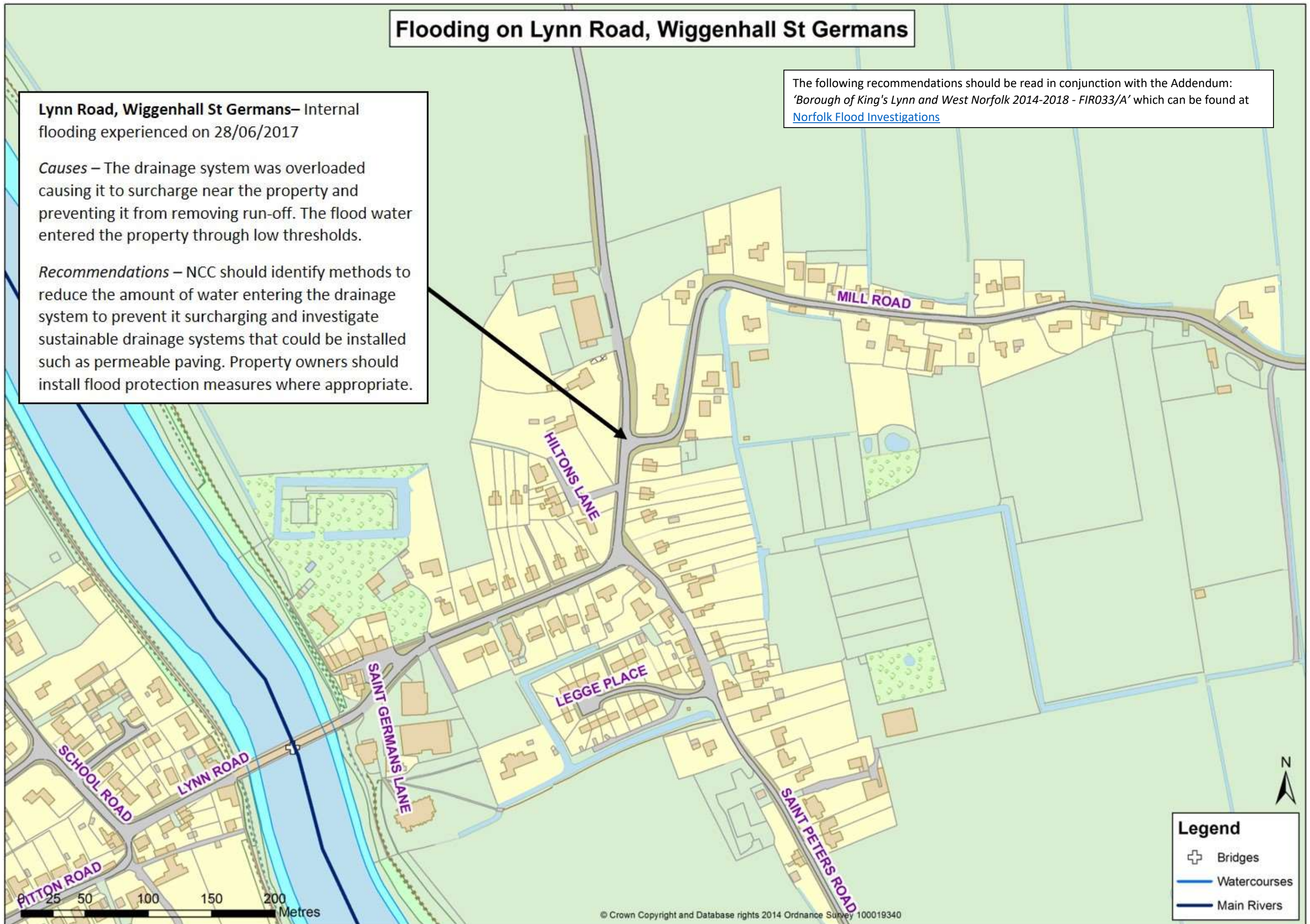
# Flooding on Lynn Road, Wighenhall St Germans

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Lynn Road, Wighenhall St Germans**– Internal flooding experienced on 28/06/2017

*Causes* – The drainage system was overloaded causing it to surcharge near the property and preventing it from removing run-off. The flood water entered the property through low thresholds.

*Recommendations* – NCC should identify methods to reduce the amount of water entering the drainage system to prevent it surcharging and investigate sustainable drainage systems that could be installed such as permeable paving. Property owners should install flood protection measures where appropriate.



## Flooding in the Marham area

### Description of area

The Street, Marham. Steep hill sloping towards the road.

### Flood incidents within this area

Within this area 4 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
19/07/2017	On the 19/07/2017 - 1 property was internally flooded on The Street, Marham. This incident was reported by a resident via email correspondence on the 19 July 2017, (FWF/17/2/5002)	NCC visited affected residents to offer advice and to gather information after the incident.
24/06/2016	On the 24/06/2016 - 1 property was internally flooded on The Street, Marham. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 24 June 2016, (FWF/16/2/3894)	NCC visited affected residents to offer advice and to gather information after the incident.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  
- Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should



- Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
- Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

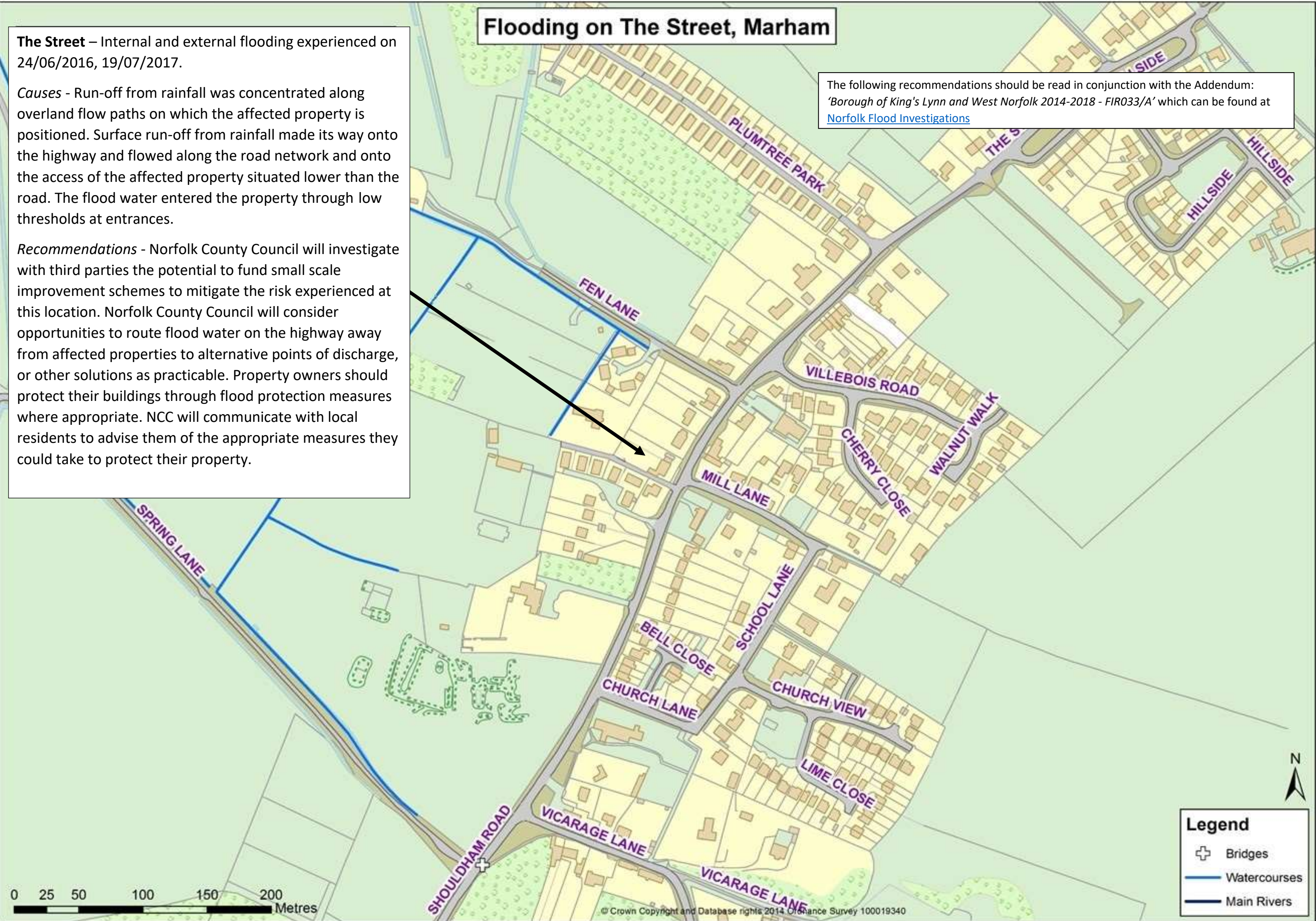
# Flooding on The Street, Marham

**The Street** – Internal and external flooding experienced on 24/06/2016, 19/07/2017.

**Causes** - Run-off from rainfall was concentrated along overland flow paths on which the affected property is positioned. Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the access of the affected property situated lower than the road. The flood water entered the property through low thresholds at entrances.

**Recommendations** - Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)



## Flooding in the Downham Market area

### Description of area

Low Road and Stow Corner, Stowbridge; London Road and Stonecross Industrial Estate, Downham Market; Church Road, Wereham; Main Road, Crimplesham; Ely Road, Denver.

Mixture of town and rural villages with Main River Great Ouse to the west.

### Flood incidents within this area

Within this area 12 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

<b>Date of Incident</b>	<b>Incident as reported</b>	<b>What was the response to the flood incident</b>
27/12/2017	On the 27/12/2017 - 1 property was internally flooded on Ely Road, Denver. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 2 January 2018, (FWF/17/2/5867)	Anglian Water Services Ltd visited affected residents to offer advice and to gather information after the incident. NCC assessed the capacity of their drainage system after the incident. NCC visited affected residents to offer advice and to gather information after the incident.
01/09/2017	On the 01/09/2017 - 1 property was internally flooded on Ely Road, Denver. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 15 September 2017, (FWF/17/2/5286)	Anglian Water Services Ltd visited affected residents to offer advice and to gather information after the incident. NCC identified the need to renew [or replace] the existing drainage scheme that serves the flooding location after the incident. NCC visited affected residents to offer advice and to gather information after the incident.
19/07/2017	On the 19/07/2017 - 1 property was internally flooded on Church Road, Wereham. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 26 July 2017, (FWF/17/2/5080)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident. NCC visited affected residents to offer advice and to gather information after the incident. NCC identified the need to replace a damaged culvert within the existing drainage scheme that serves the flooding location after the incident.
21/08/2016	On the 21/08/2016 - 1 property was internally flooded on Main Road, Crimplesham. This incident was reported by a Parish Councillor via email correspondence on the 21 August 2016, (FWF/16/2/3231)	The Fire and Rescue Service responded and pumped out during the incident. NCC visited affected residents to offer advice and to gather information after the incident.

25/06/2016	On the 25/06/2016 - 1 property was internally flooded on Main Road, Crimplesham. This incident was reported by a Parish Councillor via email correspondence on the 21 August 2016, (FWF/16/2/3232)	NCC visited affected residents to offer advice and to gather information after the incident.
	On the 25/06/2016 - 1 property was internally flooded on London Road, Downham Market. This incident was reported by a resident via an online flood report form on the 28 June 2016, (FWF/16/2/2886)	NCC visited affected residents to offer advice and to gather information after the incident.
23/06/2016	On the 23/06/2016 - 1 property was internally flooded on Stonecross Industrial Estate, Downham Market. This incident was reported by the Fire and Rescue Service via an electronic report on the 10 July 2016, (FWF/16/2/3373)	The Fire and Rescue Service responded and pumped out during the incident. NCC visited affected residents to offer advice and to gather information after the incident.
21/06/2016	On the 21/06/2016 - 1 property was internally flooded on Low Road, Stowbridge. This incident was reported by a resident via email correspondence on the 21 June 2016, (FWF/16/2/2785)	NCC have assessed the validity and impact of the flood report
07/01/2016	On the 07/01/2016 - 1 property was internally flooded on Stowbridge Road, Stow Bardolph. This incident was reported by a resident via a flood questionnaire on the 10 February 2016, (FWF/16/2/2370)	The Fire and Rescue Service responded and pumped out during the incident. Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident. NCC replaced the culvert downstream of the affected property. NCC assessed the capacity of their drainage system after the incident. NCC visited affected residents to offer advice and to gather information after the incident.
11/10/2014	On the 11/10/2014 - 1 property was internally flooded on Church Road, Wereham. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 14 October 2014, (FWF/14/2/0918)	Norfolk County Council (Highways) visited affected residents to offer advice and to gather information after the incident.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

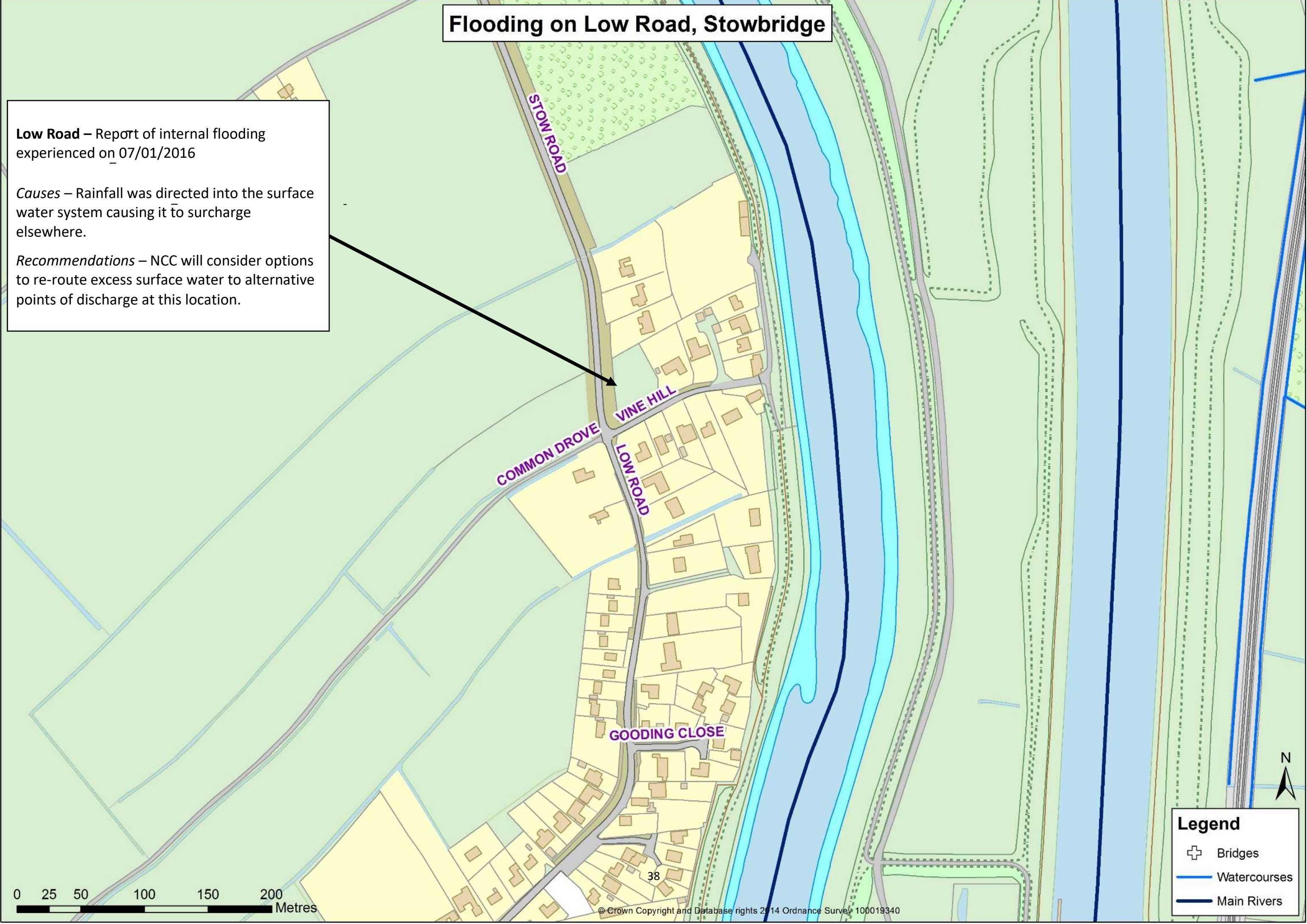
- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

# Flooding on Low Road, Stowbridge

**Low Road** – Report of internal flooding experienced on 07/01/2016

*Causes* – Rainfall was directed into the surface water system causing it to surcharge elsewhere.

*Recommendations* – NCC will consider options to re-route excess surface water to alternative points of discharge at this location.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

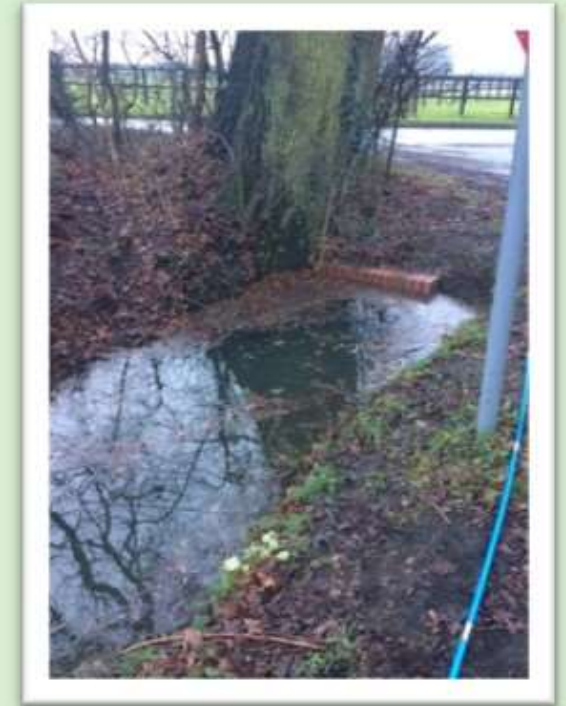
## Flooding on Stowbridge Road, Stowbridge

**Stow Corner**– Report of internal flooding experienced on 07/01/2016

**Causes** – Surface run-off from rainfall flowed along the road network and onto the property access that was situated lower than these features. Surface run-off also flowed into the surface water drainage system that was overloaded. Flood water was further obstructed by impermeable surfaces.

**Recommendations** – NCC will consider options to route flood water on the highway away from the property. NCC will review the level of maintenance required for the drainage systems to ensure efficiency and investigate with third parties the potential for installing permeable areas in the affected location.

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)



# Flooding on Church Road, Wereham

Church Road— Internal and external flooding experienced on 11/10/2014 & 19/07/2017

*Causes* – Surface run-off from rainfall flowed along the road network and onto the property access that was situated lower than these features. Surface run-off also flowed into the surface water drainage system that was overloaded and obstructed by debris. This surcharged elsewhere and entered the property through low thresholds at entrances.

*Recommendations* – NCC will consider options to route flood water on the highway away from the property. NCC will review the level of maintenance required for the drainage systems, the level of water entering the systems and consider alternative points of discharge.



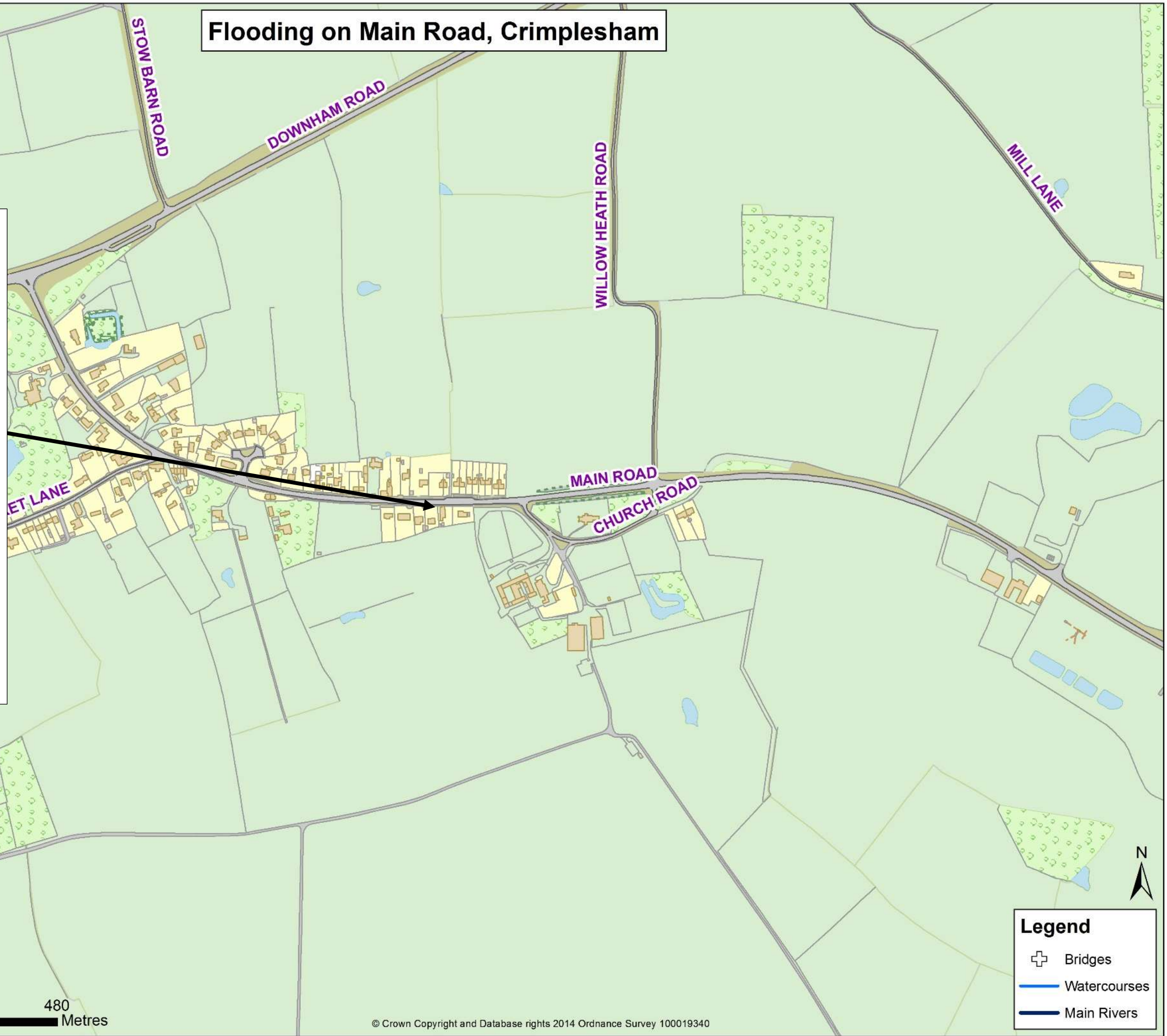


# Flooding on Main Road, Crimplasham

Main Road– Internal flooding experienced on 25/06/2018 & 21/08/2016

*Causes* – Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features. Some rainfall was concentrated on the highway which led to passing vehicles washing the water towards the property. Any water directed towards surface water drainage network was obstructed by debris, directing flood water towards the property. The flood water entered the property through low thresholds at entrances.

*Recommendations* – Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from affected properties. NCC will review maintenance levels of drainage systems and the amount of water entering them. NCC will liaise with local property owners to help them protect their buildings through flood protection measures



0 60 120 240 360 480 Metres

# Flooding on London Road, Downham Market

**London Road** – Internal and external flooding experienced on 01/09/2017 & 27/12/2017

**Causes** – Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the access of the affected property that was situated lower than the road. Water directed towards surface water drainage network could not be accommodated as the network was overloaded, causing it to surcharge elsewhere which led to flood water entering the property through low thresholds at entrances.

**Recommendations** – Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from the affected property. NCC will review maintenance levels of drainage systems and the amount of water entering them, identifying methods of removing excess surface water. NCC will liaise with local property owners to help them protect their buildings through flood protection measures.



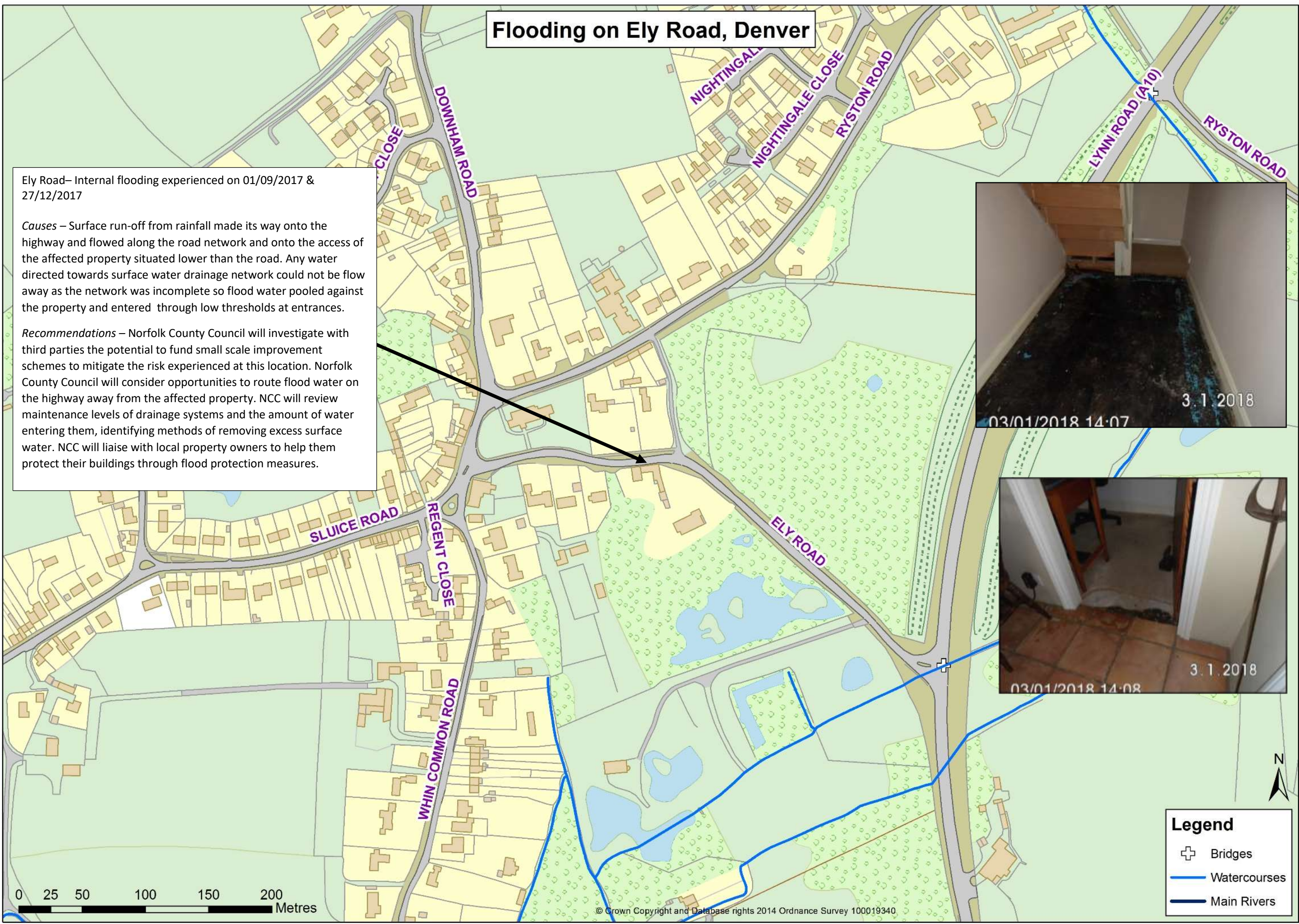
The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

# Flooding on Ely Road, Denver

Ely Road– Internal flooding experienced on 01/09/2017 & 27/12/2017

*Causes* – Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the access of the affected property situated lower than the road. Any water directed towards surface water drainage network could not be flow away as the network was incomplete so flood water pooled against the property and entered through low thresholds at entrances.

*Recommendations* – Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from the affected property. NCC will review maintenance levels of drainage systems and the amount of water entering them, identifying methods of removing excess surface water. NCC will liaise with local property owners to help them protect their buildings through flood protection measures.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

# Flooding on Stonecross Industrial Estate, Downham Market

**Stonecross Industrial Estate**– Internal and external flooding experienced on 23/06/2016

*Causes* – Run-off from rainfall pooled at a low point and a large area of impermeable surfaces caused this water to be directed quickly towards the property and enter through low thresholds at entrance.

*Recommendations* – Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property



0 25 50 100 150 200 Metres

**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

## Flooding in the Upwell area

### Description of Area

Croft Road, Upwell.

Rural fenland area with extensive open drains and canalised rivers.

### Flood incidents within this area

Within this area 2 incidents of internal flooding have been assessed as part of this investigation.

These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
15/05/2018	On the 15/05/2018 - 1 property was internally flooded on Croft Road, Upwell. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 15 May 2018, (FWF/18/2/6508)	Norfolk County Council assessed the validity and impact of the flood report

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

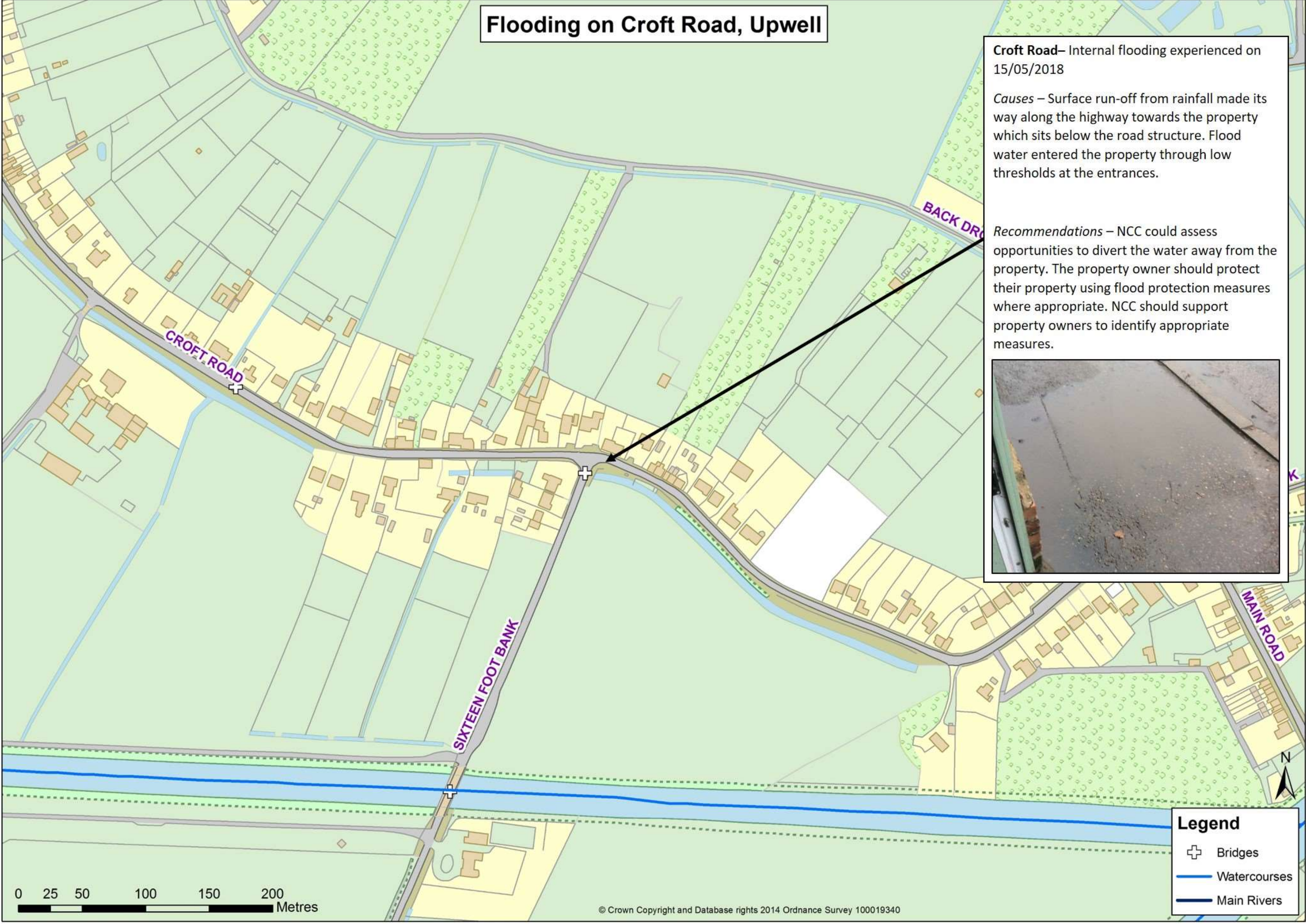
- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
  
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

# Flooding on Croft Road, Upwell

**Croft Road**– Internal flooding experienced on 15/05/2018

*Causes* – Surface run-off from rainfall made its way along the highway towards the property which sits below the road structure. Flood water entered the property through low thresholds at the entrances.

*Recommendations* – NCC could assess opportunities to divert the water away from the property. The property owner should protect their property using flood protection measures where appropriate. NCC should support property owners to identify appropriate measures.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

0 25 50 100 150 200 Metres

## Flooding in the Methwold area

### Description of area

Hythe Road, Methwold. Village with agriculture, woodland and some drains and dykes nearby.

### Flood incidents within this area

Within this area 4 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/06/2016	On the 23/06/2016 - 1 property was internally flooded on Hythe Road, Methwold. This incident was reported by the media via an article on the 24 June 2016, (FWF/16/2/2825)	The Fire and Rescue Service responded and pumped out during the incident. NCC visited affected residents to offer advice and to gather information after the incident.
12/06/2016	On the 12/06/2016 - 1 property was internally flooded on Hythe Road, Methwold. This incident was reported by the Borough Council of King's Lynn and West Norfolk via email correspondence on the 15 June 2016, (FWF/16/2/2748)	NCC assessed the capacity of their drainage system after the incident.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.



Following flooding to people, property and infrastructure;

- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

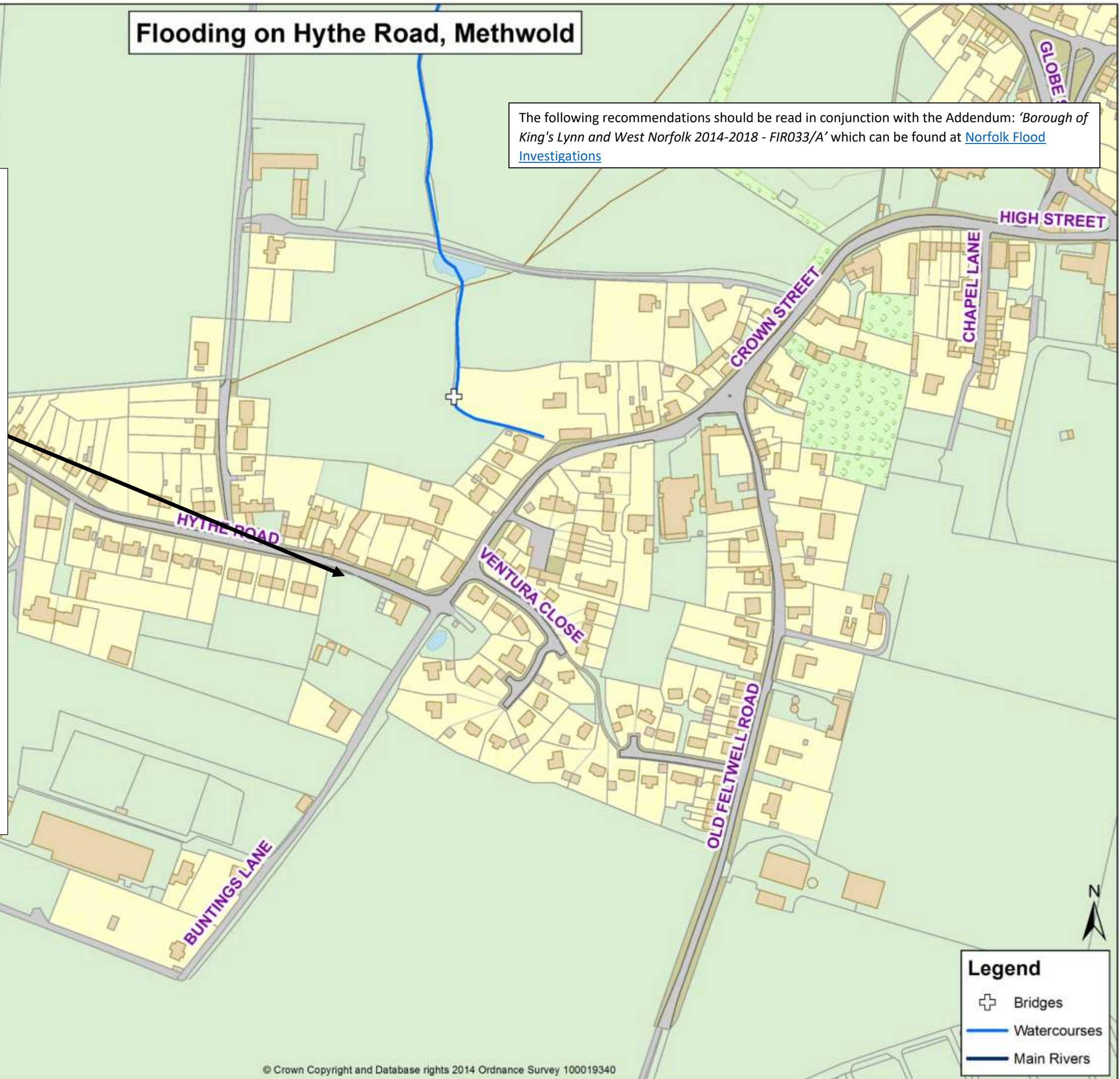
# Flooding on Hythe Road, Methwold

The following recommendations should be read in conjunction with the Addendum: 'Borough of King's Lynn and West Norfolk 2014-2018 - FIR033/A' which can be found at [Norfolk Flood Investigations](#)

**Hythe Road** – Internal flooding experienced on 23/06/2016 and 12/06/2016

**Causes** – Due to the development of impermeable surfaces localised ground conditions caused run-off to be directed quickly from where it fell as rain to the areas of flooding. Surface run-off from rainfall made its way onto the highway and flowed onto the access of the property. Run-off directed towards the surface water drainage network and could not be accommodated as the system was overloaded.

**Recommendations** – Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from the affected property. NCC should work with partner organisations to identify the potential for managing the surface water entering their drainage system in flood events. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.



**Legend**

- ⊕ Bridges
- Watercourses
- Main Rivers

## Flooding in the Walpole area

### Description of area

Wisbech Road, Walpole St Andrew.

Low lying fenland area with extensive network of minor roads and drainage ditches.

### Flood incidents within this area

Within this area 1 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
14/07/2014	On the 14/07/2014 - 1 property was internally flooded on Wisbech Road, Walpole St Andrew. This incident was reported by Norfolk County Council (Highways) via an electronic report on the 6 August 2014, (FWF/14/2/0785)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.

### Recent rainfall within the area

There were no rain gauges within 2.5km of the incidents of flooding within this area.

### Causes of flooding within the area and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the area as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Following flooding to people, property and infrastructure;

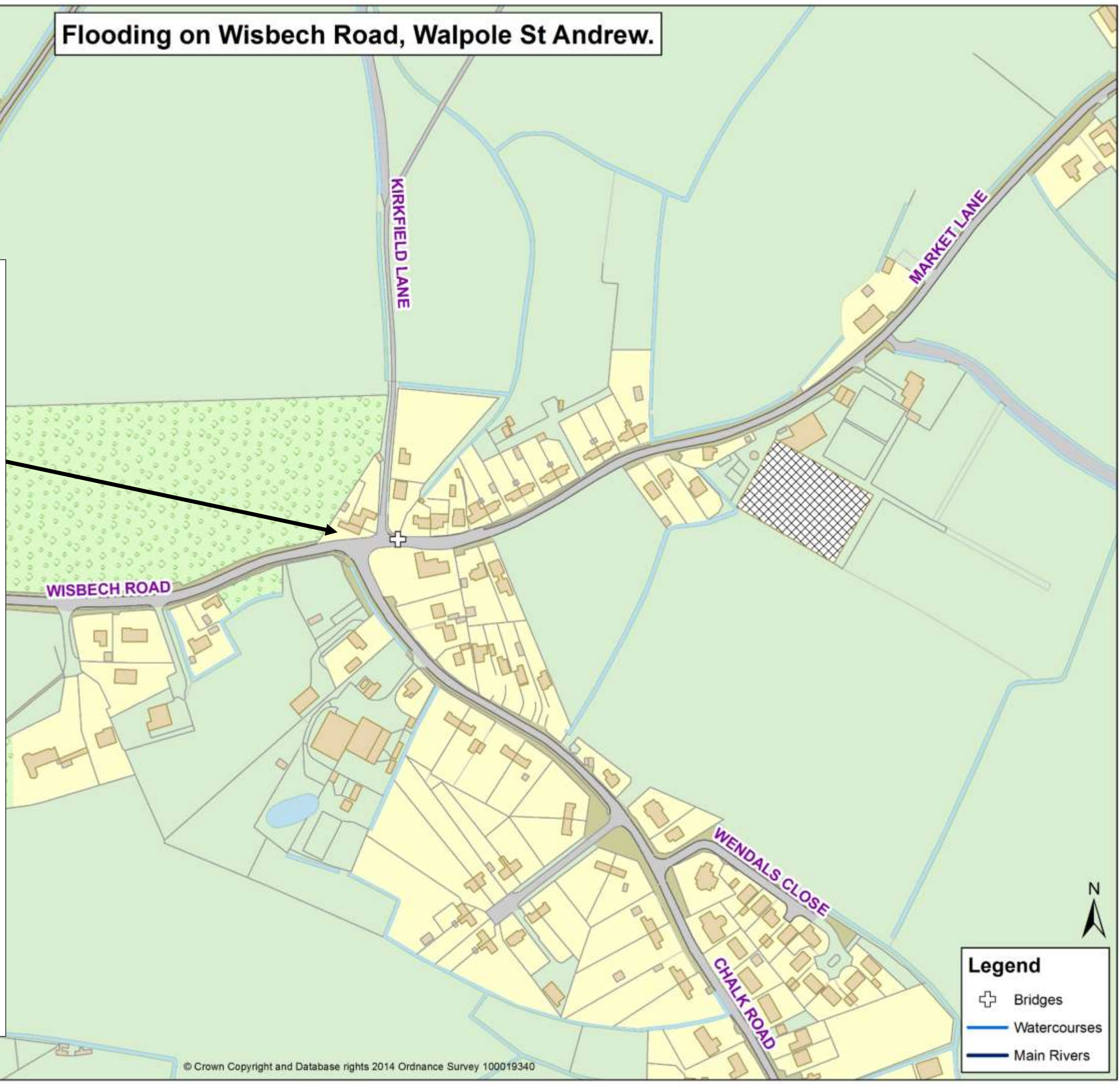
- Risk Management Authorities should
  - Communicate with affected residents where their assets have given rise to the flooding of properties.
  - Review the appropriateness of their response to flooding.
  - Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
  - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
  - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

# Flooding on Wisbech Road, Walpole St Andrew.

**Wisbech Road**– Internal flooding experienced on 14/07/2014.

*Causes* – Run-off from rainfall pooled at a low point within the area affecting property. Surface run-off from rainfall made its way onto the highway and flowed onto the access of the property. The surface water drainage system network was partially obstructed by debris or silt, reducing the efficiency of the upstream drainage system.

*Recommendations* – Norfolk County Council will investigate with third parties the potential to fund small scale improvement schemes to mitigate the risk experienced at this location. Norfolk County Council will consider opportunities to route flood water on the highway away from the affected property. NCC will review the level of maintenance required to sustain the design efficiency of their drainage systems NCC should work with partner organisations to identify the potential for managing the surface water entering their drainage system in flood events. Property owners should protect their buildings through flood protection measures where appropriate. NCC will communicate with local residents to advise them of the appropriate measures they could take to protect their property.



## **Disclaimer**

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, we cannot guarantee that the contents will always be current, accurate or complete.

This report has been prepared as part of Norfolk County Council's responsibilities under the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Norfolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

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

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the County Council highlighting flooding to properties at a street level.

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## **Appendix A - Key definitions and responsibilities**

### **What is flooding?**

Section 1 of the Flood and Water Management Act 2010 states that: "Flood" includes any case where land not normally covered by water becomes covered by water. In addition, this section adds the caveat: "But "flood" does not include – (a) a flood from any part of the sewerage system, unless wholly or partly caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system, or (b) a flood caused by a burst water main (within the meaning given by Section 219 of the Water Industry Act 1991)."

### **What is internal and external flooding?**

For the purposes of this report, properties that have internally flooded are those where it is considered that water has entered the fabric of the building;

- Basements and below ground level floors are included.
- Garages are included if in the fabric of the building. Garages adjacent or separate from the main building are not included.
- Occupied caravans are included but not tents.

External flooding included those properties where water has entered gardens or surrounding areas which restricts access, affects the highway or where flooding has disrupted essential services to the property such as sewerage. For businesses this includes those where the flood waters are directly preventing them trading as usual.

### **What is Local Flood Risk?**

Local Flood Risk is defined by the Flood and Water Management Act 2010 as being flood risk from surface runoff, groundwater and ordinary watercourses.

- 'Surface runoff' means rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving) and, has not entered a watercourse, drainage system or public sewer.
- 'Groundwater' means all water which is below the surface of the ground and in direct contact with the ground or subsoil.
- 'Ordinary Watercourse' means a watercourse that does not form part of a main river and includes a reference to a lake, pond or other area of water which flows into an ordinary watercourse.

### **Roles and Responsibilities of Risk Management Authorities**

Below is a short summary of those groups and Risk Management Authorities ("RMAs") that have a role in managing flooding within Norfolk. The listing of responsibilities includes those duties or powers that directly relate to managing the flood incidents or consequence. All RMAs have a duty to cooperate with other RMAs.

#### **1. Norfolk County Council (as NCC)**

- Duty to investigate significant flooding from any source.
- Duty to maintain a register of structures or features which affect flood risk from all sources.
- Power to undertake works to manage flood risk from surface run-off and groundwater.
- Powers to regulate activities on ordinary watercourses outside of Internal Drainage Board areas.
- Duties as a Category 1 Responder for Emergency Planning and the Fire & Rescue Service.

#### **2. District Councils**

- Powers to undertake works on ordinary watercourses outside of IDB areas.

- The Local Planning Authority for their District area and determine the appropriateness of developments and their exposure and effect on flood risk.
- Duties as a Category 1 Responder for Emergency Planning.

### **3. Internal Drainage Boards (“IDBs”)**

- A duty to act in a manner consistent with the national and local strategies and guidance when exercising FCERM functions.
- Duty to act in a manner consistent with Local Flood Risk Management Strategies when exercising other functions that may affect flood risk.
- Powers to regulate activities on ordinary watercourses within IDB areas.
- Exercise a general power of supervision over all matters relating to the drainage of land within their district.
- Powers to undertake works on ordinary watercourses within IDB areas.

### **4. Highway Authorities (Norfolk County Council / NCC England)**

- Powers to undertake works to manage water on the highway and to move water off the highway.
- Enforcement powers to unauthorised alterations, obstructions and interferences with highway drainage.
- Have responsibilities for culverts vested in the highway. Currently NCC discharges its responsibilities associated with bridges and culverts (whether as owner or highway authority) through the inspection of condition (undertaken by the Bridges team) and through maintenance activity (delivered on a as needs basis by the relevant NCC area team).

### **5. Water Companies**

- Undertake cost beneficial capital schemes to alleviate or eliminate flooding where the flood event is associated with a failure of their assets.
- Duty to provide, improve, maintain and operate systems of public sewers and works for the purpose of effectually draining an area.
- Are responsible for flooding from their foul, combined and surface water sewers, and from burst water mains.
- Maintain ‘At Risk Registers’ for Odwa that record properties that have flooded from public foul, combined and surface water sewers and that are at risk of flooding again.
- Water companies respond to reports from the public of flooding associated with their assets and determine an appropriate response in line with their standards or customer service.
- Duties as a Category 2 Responder for Emergency Planning.

### **6. Riparian Owners**

- Duty of care towards neighbours upstream and downstream, avoiding any action likely to cause flooding.
- Entitled to protect their properties from flooding.
- May be required to maintain the condition of their watercourse to ensure that the proper flow of water is unimpeded.