



# Norfolk County Council

## Investigation Report into the flooding in the Broadland District

Area: 2017 to 2018

Report Reference: FIR034

Report prepared by Mark Ogden on 14 March 2019



## **Executive Summary**

### **(a) Flooding incidents and causes**

This report covers 3 incidents of flooding that occurred in the Broadland District area from July 2017 to April 2018.

On **06/07/2017** the Strumpshaw Road flooded under the railway bridge (FWF/17/5/4963). The flood water blocked the highway to road users.

On **17/12/2017** 1 property was internally flooded on South Burlingham Road, Lingwood (FWF/17/5/5861).

On **02/04/2018** the slip road to the A47 westbound (FWF/18/5/6390) was flooded across the highway.

Specific causes for each individual catchment on these dates are set out within the report.

### **(b) Key recommendations**

The recommendations set out in the report have been summarised below. Specific recommendations for each individual catchment 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 recommendations will be assessed as part of an addendum to this report to be undertaken a year from the date of publication of this report.

**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 and their maintenance where they have contributed to the flooding 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 it is appropriate for them to protect their buildings through flood resilience 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 land owners and partner organisations 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
- 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.

**Highways England** should;

- Consider opportunities to route flood water on the highway to alternative points of discharge, or other solutions as practicable.

**(c) Update on RMA actions in response the flooding**

- Norfolk County Council has installed a positive drainage system to direct flows away from the bridge on Strumpshaw Road, Brundall and reduce the frequency of flooding at that location

## **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 Lead Local Flood Authority 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 the Lead Local Flood Authority 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 Broadland District Area from 2017 to 2018 as:

- one commercial property was internally flooded.
- two priority roads were affected by flooding.

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

The flood investigation report aims to:

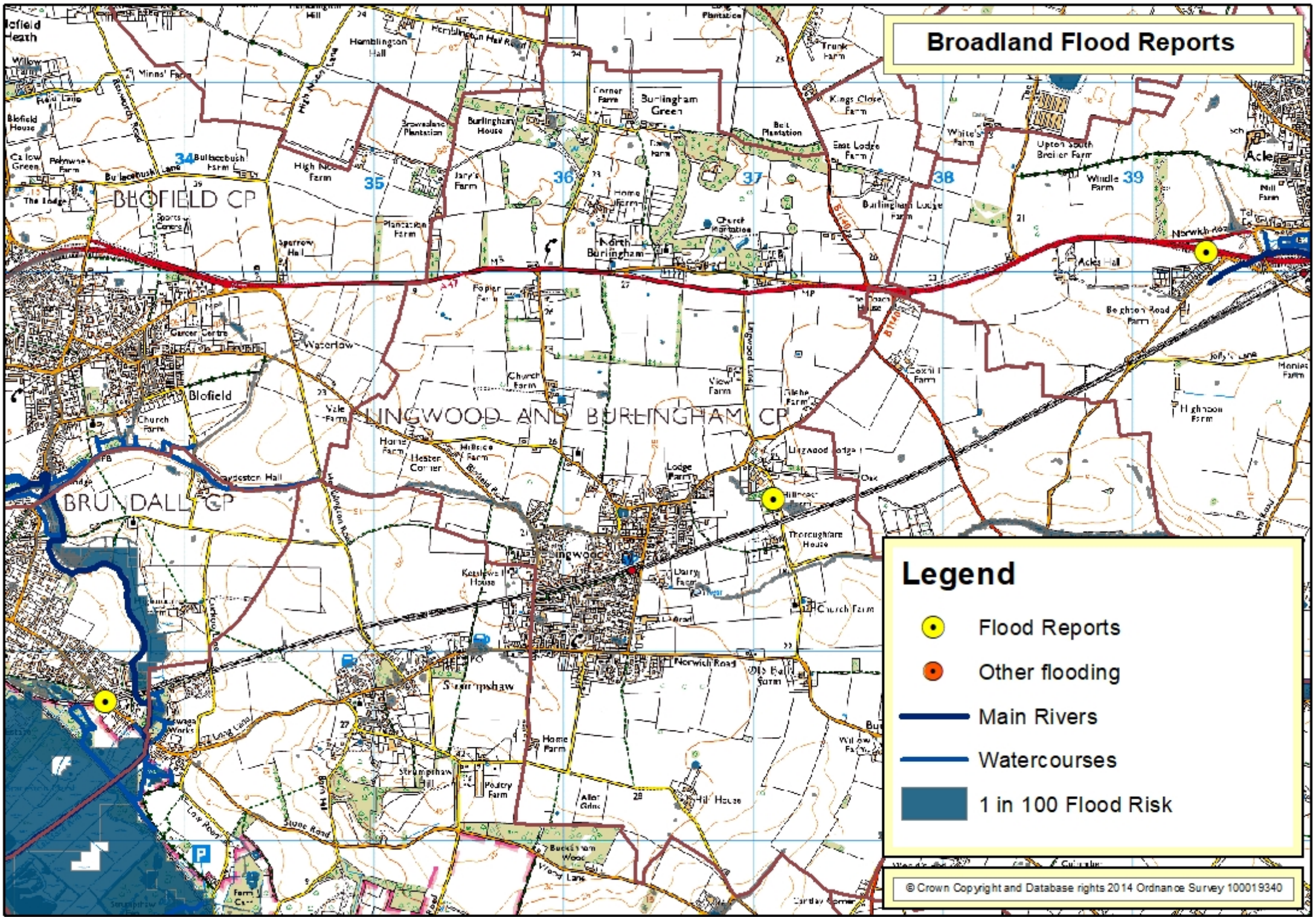
- provide a transparent and consistent review of recent flooding.
- identify those organisations and individuals who have responsibility to manage the causes of the flooding.
- identify what their response has been or will be to the flooding.
- make recommendations as to how the flood risk could be mitigated 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 resilience: 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.

# Broadland Flood Reports



## Legend

-  Flood Reports
-  Other flooding
-  Main Rivers
-  Watercourses
-  1 in 100 Flood Risk

## **A47 slip road, Acle**

### Flooding and flood risk within this catchment

This small catchment is a mixture of rural land and highway. The drainage network connects to Coleman's Drain which runs west to east, before discharging to the River Bure.

### Flood incidents within this location

We are aware of flooding at this location on 02/04/2018 and 12/07/2017.

### Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment 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.

The location of flooding in this catchment is within 2.5km of a rain gauge. The rainfall events recorded by gauges for this catchment are;

- 11 July 2017 - 9.4mm rainfall was recorded as falling in 2 hours 0 minutes at the Acle STW rainfall monitoring station.
- 12 July 2017 - 5mm rainfall was recorded as falling in 2 hours 30 minutes at the Acle STW rainfall monitoring station.
- 02/04/2018 – no data was recorded due to faulty TBR

## D1 – Acle Detail Map



### A47 slip road

This location was flooded on 02/04/2018. This incident was reported by Broadland District Council.





Causes – Surface run-off from rainfall that had made its way onto roads and the highway flowed along the road network and pooled at a low point within the catchment.

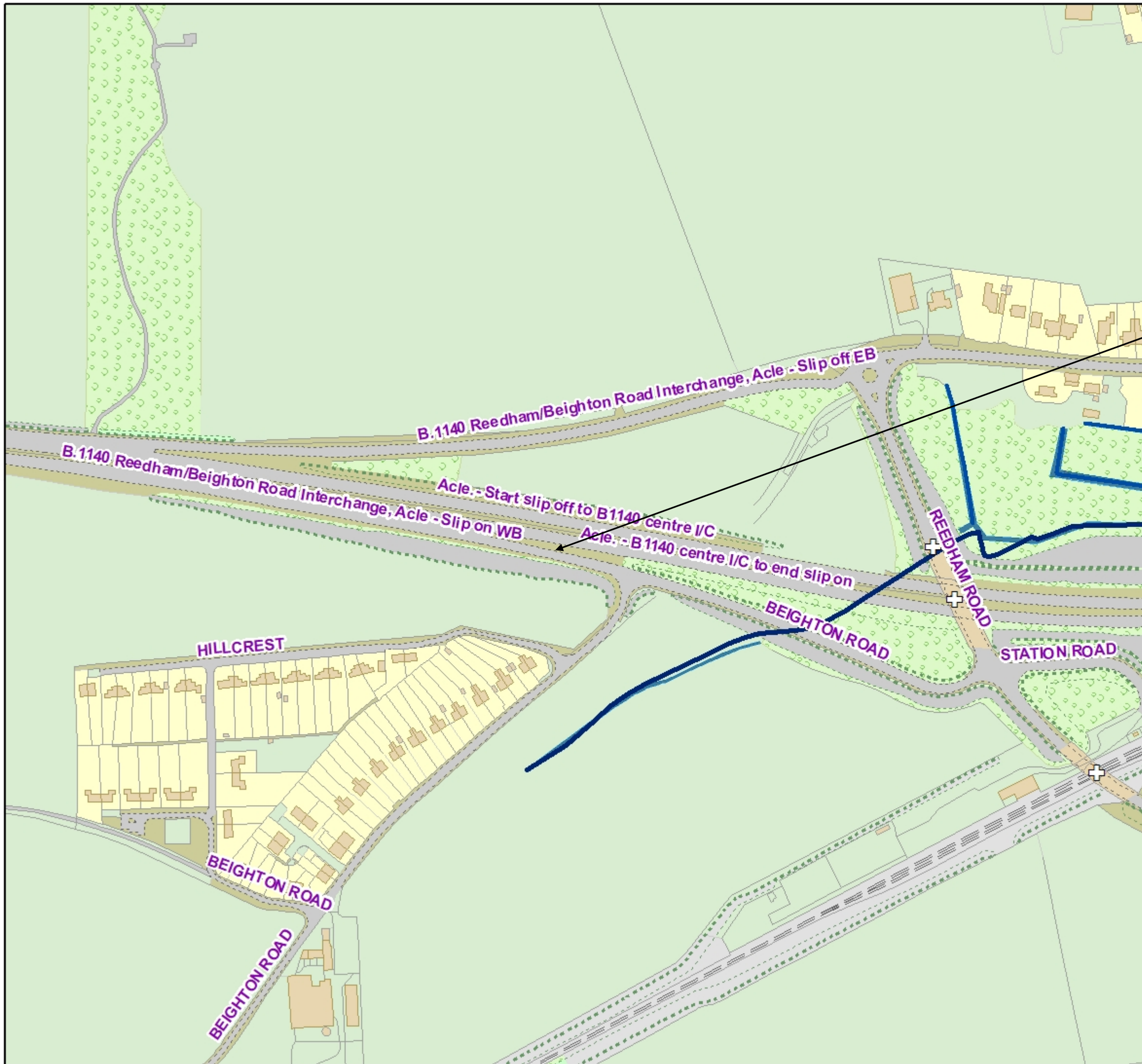
### A47 slip road

Flooding at this location has also been reported on 12/07/2017

Recommendations – The Highways Authorities should consider opportunities to route flood water on the highway to alternative points of discharge, or other solutions as practicable.

### Legend

-  Bridges
-  Watercourses
-  Main Rivers
-  Water bodies



## **Strumpshaw Road, Brundall**

### Flooding and flood risk within this catchment

This small catchment is predominately sub-urban. Surface water flows from the north-west to south-east. The drainage network connects to Witton Run / Run Dike which flow north to south at this location, before discharging to the River Yare.

### Flood incidents within this location

We are aware of flooding at this location on 06/07/2017 and 14/07/2014



## D2 – Brundall Detail Map



### Strumpshaw Road

This location was flooded on 06/07/2017. This incident was reported by a member of the public.

Causes – Surface run-off from rainfall that had made its way onto roads and the highway flowed along the road network and pooled at a low point within the catchment.





Flooding at this location has also been reported on 14/07/2014

### Strumpshaw Road

Norfolk County Council (Highways) have assessed the capacity of their drainage system after the incident.

Recommendations – Norfolk County Council should consider opportunities to route flood water on the highway to alternative points of discharge, or other solutions as practicable.

### Legend

-  Bridges
-  Watercourses
-  Main Rivers
-  Water bodies



## **South Burlingham Road, Lingwood**

### Flooding and flood risk within this catchment

This largely rural catchment flows from the north-west to south-east, before it connects to Beighton Drain which in turn discharges to the River Bure east of Acle.

### Flood incidents within this location

We are aware of flooding at this location on 27/12/2017

## D3 – Lingwood Detail Map



### South Burlingham Road





One property was flooded on 27/12/2017, this was reported by the property owner.

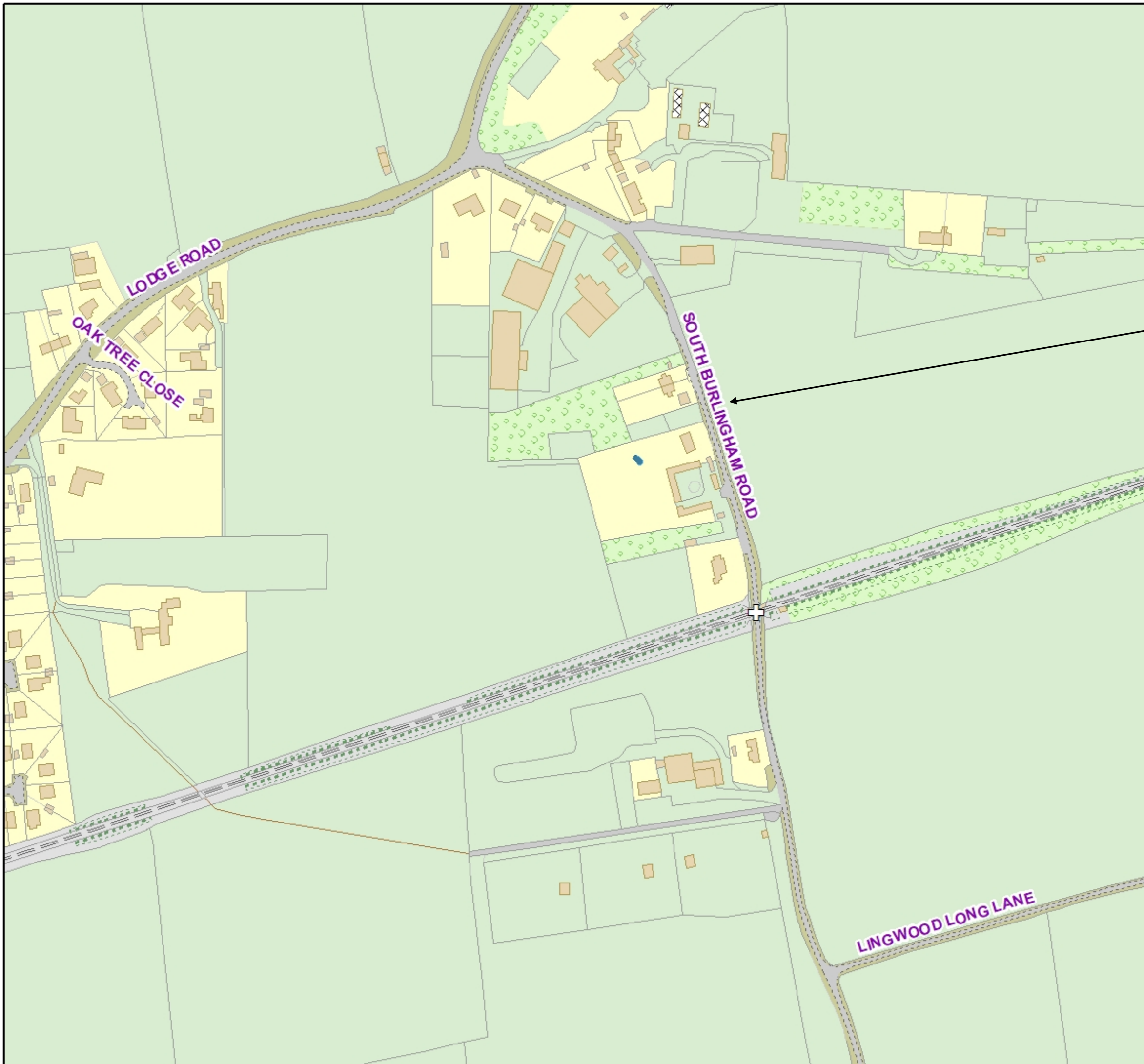
Causes – Run-off from significant rainfall across the catchment was directed along flow paths on which the property was situated. The flood water entered the property through the unprotected structure of the building such as low thresholds at entrances.

### South Burlingham Road

Property owners could approach landowners to seek improvements in land management to reduce the levels of run-off from agricultural land. Property owners could protect their buildings through flood protection measures where appropriate. Norfolk County Council 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.

### Legend

-  Bridges
-  Watercourses
-  Main Rivers
-  Water bodies



## **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 Lead Local Flood Authority)**

- 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 / Highways 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 Highways 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 Ofwat 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.