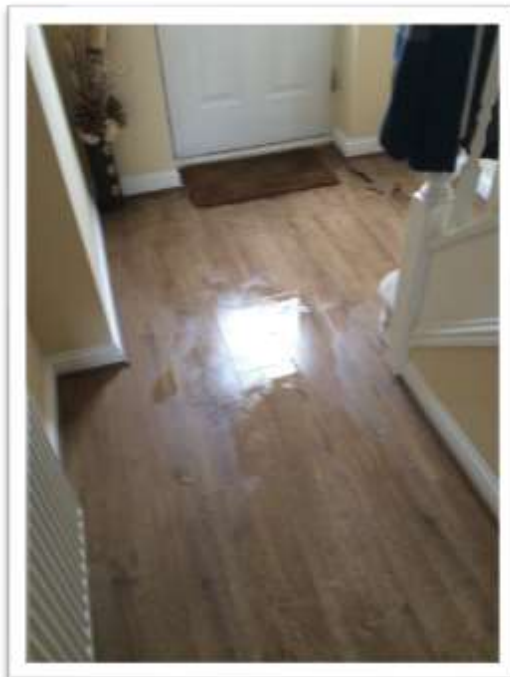




Investigation Report into the flooding in Breckland Various in 2014-2017

Report Reference: FIR039

Draft Report prepared by Nathalie Harris on 17 July 2019



Executive Summary

(a) Flooding incidents and causes

This report includes the internal flooding of 6 properties over a series of dates ranging from 2014-2017. Principally those included in this report are individual properties located across Breckland District Council within the following parishes:

- Attleborough
- Dereham
- Scarning
- Watton

The flooding that occurred across Breckland was related to the following causes:

- Surface run-off flowpaths
- Surface run-off from roads
- Significant rainfall
- Drainage systems that are not designed to cope with a significant event and in such cases were exceeded
- Individual property drainage being unmaintained
- Drainage system or outfall blockage, unmaintained or obstructed
- Overloading and surcharging of drainage systems

(b) Key recommendations

Our conclusion is that:

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 rainfall events as well as mitigating flooding

Property owners of affected properties should:

- 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

- Seek to remind riparian owners of their responsibility to undertake appropriate levels of maintenance to sustain the efficiency of the drainage systems
- 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
- Work with partner organisations to identify the potential for managing the amount of surface water entering their drainage system in flood events

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

The Environment Agency should:

- Work with riparian owners to review the maintenance of main rivers to manage the risk of surcharging during flood events

Please note that an addendum has been published to provide an update on subsequent actions taken following the initial response of Risk Management Authorities and individuals to the flood event as detailed within this report. This addendum can be found at the following [link](#).

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 Breckland in 2014- 2017 as:

- multiple residential properties were internally flooded.
- a 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

Reports of Flooding in Breckland



Flooding in Dereham

Description of area

Dereham is a small market town in the middle of Norfolk within the Breckland District and has a population of approximately 19 000.

Flood incidents within Dereham

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 rd June 2016 – there was external flooding on Watery Lane, Scarning. This incident was reported by a resident via personal communication on the 28 th July 2017 (FWF/16/3/6186). There were two further reports of external flooding reported in Scarning on this day.	Norfolk County Council (Lead Local Flood Authority): <ul style="list-style-type: none">• visited affected residents to offer advice and to gather information after the incident.• Contacted riparian owners to fulfil their responsibilities in clearing the obstructed ditch.
27/06/2014	On the 27 th June 2014 - 2 properties were internally flooded on Wavell Road, Dereham. These incidents were reported by a resident via an online flood report form on the 27 th June 2014, (FWF/14/3/0660) & (FWF/14/3/1132).	Norfolk County Council (Highways) assessed the capacity of their drainage system after the incident.

Recent rainfall within Dereham

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.

2 of the incidents of internal flooding in this catchment are within 2.5km of a rain gauge. The rainfall event recorded by a rain gauge for this area is: 27th June 2014- 35mm rainfall was recorded as falling in 45 minutes at the East Dereham STW rainfall monitoring stations. The intensity of rainfall for the total duration equates to a 105 year rainfall event.

The remaining incident was not within 2.5km of a rain gauge but the following information regarding the local weather has been noted: 23rd June 2016- Localised flooding was reported across Norfolk on this day and rainfall was above average for the month.

The findings of the investigation are detailed on the following pages. There is a map for each address affected. The maps detail the causes that led to flooding within the catchment 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 maps set out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Flooding on Watery Lane

Watery Lane, Scarning: External flooding experienced on 23rd June 2016

Causes-

- A watercourse adjacent to the highway was fully obstructed by debris and silt due to lack of maintenance by the riparian owner.
- This combined with run-off from significant rainfall that concentrated along surface water flow paths.
- This blocked a culvert causing the failure of the drainage system contributing to flooding at the affected property.
- The Met office reports localised flooding across Norfolk which is thought to have contributed.

Recommendations –

- Norfolk County Council will communicate with riparian owners reminding them of their duties.
- Riparian owners should review the level of maintenance required to sustain the design efficiency of their drainage systems and identify the potential for managing the amount of surface water entering their drainage system in flood events.
- Property owners should 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
- Property owners should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency through measures such as reinstating the watercourse.

The following recommendations should be read in conjunction with the Addendum: 'Flooding in the Breckland District 2014-2017 – FIR039/A' which can be found at [Norfolk Flood Investigations](#)



Legend

- Watercourses
- Main Rivers
- + Bridges

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Wavell Road, Dereham: Internal flooding experienced on the 27th June 2014.

Causes –

- Run-off from significant rainfall was directed towards the surface water drainage network. These flows could not be accommodated as the system was already overloaded.
- This flood water pooled at a low point within the catchment and the flood water entered the properties through low thresholds at entrances.
- The property is located at the foot of a hill and so it was determined that the sheer volume of rainfall that day temporarily overwhelmed the system and caused the flooding. The Met office reports thunderstorms across Norfolk on this day and the local monitoring station recorded an intensity of rainfall for equating to a 105 year rainfall event.

Recommendations –

- Property owners should 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.

Flooding on Wavell Road

The following recommendations should be read in conjunction with the Addendum: 'Flooding in the Breckland District 2014-2017 – FIR039/A' which can be found at [Norfolk Flood Investigations](#)



Legend

- ⊕ Bridges
- Watercourses
- Main Rivers
- Water bodies

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Flooding in North Elmham

Description of area

A village and civil parish in the Breckland District covering an area of 19km² with a population of around 1,400.

Flood incidents within this area

Within North Elmham, 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
27/07/2015	On the 27 th July 2015 - 1 property was internally flooded on Larch Grove, North Elmham. This incident was reported by Norfolk County Council (Highways) via email correspondence on the 27 th July 2015 (FWF/15/3/1734)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.

Recent rainfall within North Elmham

There were no rain gauges within 2.5km of the incident of flooding within this area. However, the Met office reports above average rainfall for August 2015. For this date in particular it notes: 'a vigorous area of low pressure for the time of year swept in from the west during the 26th bringing rain to all areas for much of the day of the 27th'. This is worth noting when looking at the causes of flooding in Larch Grove.

Causes of flooding within North Elmham and recommendations

The findings of the investigation are detailed on the following pages. There is a map for each address affected. The maps detail the causes that led to flooding within the catchment 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 maps set out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Flooding on Larch Grove

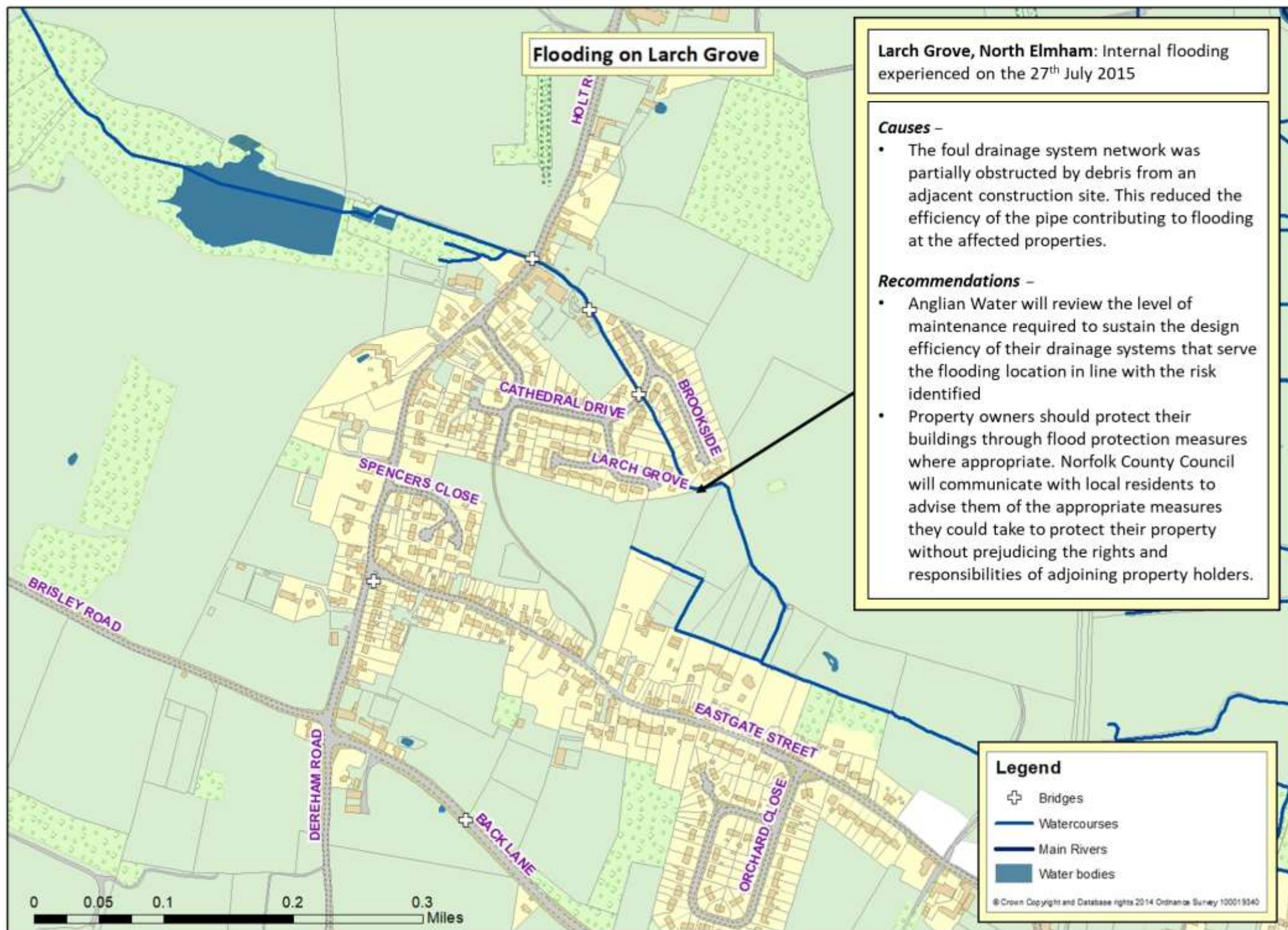
Larch Grove, North Elmham: Internal flooding experienced on the 27th July 2015

Causes –

- The foul drainage system network was partially obstructed by debris from an adjacent construction site. This reduced the efficiency of the pipe contributing to 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 serve the flooding location in line with the risk identified
- Property owners should 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.



Flooding in Attleborough

Description of area

A market town and civil parish in the Breckland District covering an area of 22km² and home to a population of approximately 10, 400.

Flood incidents within this area

Within this area 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
31/08/2014	On the 31 st August 2014 - 1 property was internally flooded on Exchange Street, Attleborough. This incident was reported by a resident via an electronic report on the 26 th September 2014 (FWF/14/3/0874)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.

Recent rainfall within Attleborough

The data retrieved from the nearest rain gauge was determined as insignificant and therefore analysis would not be of benefit to this investigation.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. There is a map for each address affected. The maps detail the causes that led to flooding within the catchment 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 maps set out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Exchange Street, Attleborough: Internal flooding experienced on the 31st August 2014

Causes –

- Run-off from rainfall was directed towards the drainage network. These flows could not be accommodated as the system is of insufficient capacity to deal with this amount of water. This directed flood water towards the affected property.
- Rainfall was concentrated on the highway. Vehicles using the highway passed through the flood water causing it to wash towards the affected property.

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. 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.
- The property owner should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.
- Property owners should 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.

Flooding on Exchange Street



Legend

- ⊕ Bridges
- Watercourses
- Main Rivers
- Water bodies

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Flooding in Watton

Description of area

A market town in the Breckland District with a population of around 6, 800.

Flood incidents within this area

Within Watton, 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
31/08/2015	<p>On the 31st August 2015 - 1 property was internally flooded on Goffe Close, Watton. This incident was reported by a resident via an electronic report on the 20th September 2015, (FWF/15/3/1913)</p> <p>There were two other reports of external flooding on this day on Goffe Close.</p>	<p>Fire Service attended to pump water away and were on site for four hours.</p> <p>Anglian Water and Norfolk County Council also attended.</p>

Recent rainfall within the catchment

There are no rain gauges within 2.5km of this incident of flooding. The Met office records rain in many areas for much of 31st August. However, it has been determined that the flooding in Goffe Close is not influenced by the level of rainfall.

Historic Flooding in Watton

Date of Incident	Impact
15/06/2009	One resident reported internal flooding of three properties after a heavy storm, recording water depths of up to 2 feet.
11/11/2010	One resident reported external flooding outside the front of their property
03/03/2011	One resident reported external flooding. A drain cleaning team was sent by Breckland District Council.
11/08/2014	One resident reported external flooding.

Causes of flooding within Watton and recommendations

The findings of the investigation are detailed on the following pages. There is a map for each address affected. The maps detail the causes that led to flooding within the catchment 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 maps set out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Goffe Close, Watton: Internal flooding experienced on 31st August 2015

Causes –

- Surface run-off from rainfall made its way onto roads and flowed along the road network and onto the accesses of affected properties that were situated lower than these features. Rainfall was directed into the foul drainage system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property.

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. 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 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 Goffe Close



The following recommendations should be read in conjunction with the Addendum: 'Flooding in the Breckland District 2014-2017 – FIR039/A' which can be found at [Norfolk Flood Investigations](#)

Legend

- ⊕ Bridges
- Watercourses
- Main Rivers
- Water bodies

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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.