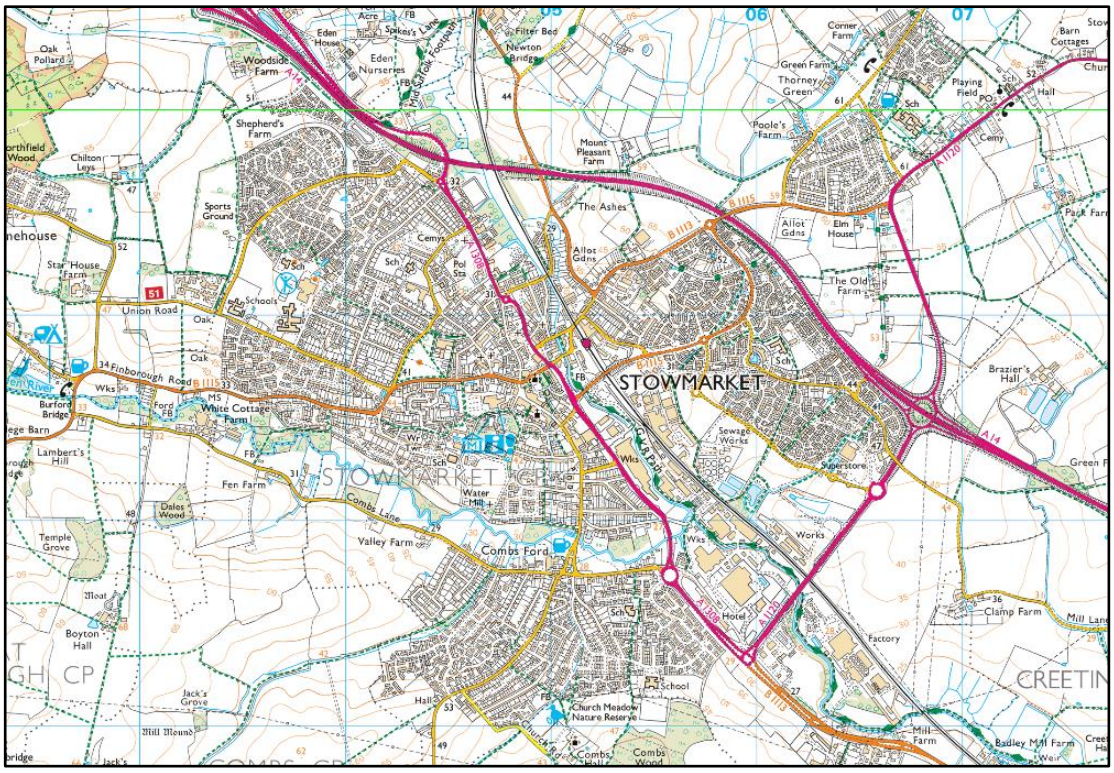
Section 19 Flood and Water Management Act 2010

Stowmarket Flood Investigation – Storm Babet 2023



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Executive Summary

Storm Babet caused significant disruption to communities across Suffolk between 18th - 21st October 2023. Stowmarket was a community that was significantly impacted, with approximately 22 properties suffering internal flooding as well as disruption to infrastructure and services. Suffolk County Council, as Lead Local Flood Authority, have therefore undertaken a Section 19 Flood Investigation. The resulting report will:

- highlight the probable causes of flooding
- identify options to reduce future flood risk and increase property resilience
- make recommendations for actions by relevant responsible organisations, landowners or homeowners.

Stowmarket is located in an area at significant risk of both fluvial and pluvial flooding and the nature of the surrounding topography and geology contributes to the susceptibility of the community to flooding. Areas of Stowmarket are low-lying, surrounded by a steep rural catchment. Multiple flood water flow paths converge near to Stowmarket, where the gradient is noticeably shallow. The local geology and soils are susceptible to high run off, making a high number of properties in the town vulnerable to flooding due to intense rainfall events.

Storm Babet delivered significant rainfall to the catchment, following an extended period of above average rainfall. Impacts within Stowmarket were widespread and for the purposes of this report, the affected areas have been categorised into ten zones. The description of the flood events detailed in the report have been compiled using data submitted to Suffolk County Council, as well as information from Risk Management Authorities (e.g. Suffolk County Council Highways and Anglian Water).

A comprehensive summary for each zone is provided within the report, outlining the context of the event and the impact. Key findings are that Stowmarket was severely impacted by flooding due to the intensity and duration of rainfall which overwhelmed the natural flow routes and the capacity of watercourses and drainage infrastructure. This situation was compounded when overland flow paths converged and saw the resultant internal flooding of property.

Short, medium and longer term recommendations have been published and each have a potential role to improve resilience and reduce the risk of flooding to Stowmarket. For short term measures, key highlights include the implementation of a community flood plan and maximising Property Flood Resilience (PFR) grants. For medium to longer term recommendations, there is emphasis on the management of water from rural land though new natural flood management features, and local improvements to watercourses to reduce flood risk within the catchment.

Justification for Investigation

Suffolk County Council, Lead Local Flood Authority (LLFA) has determined that in accordance with our criteria, it is considered necessary and appropriate to carry out an investigation into this flood event.

This is in accordance with Section 19 (1) of the Flood and Water Management Act 2010, and in accordance with Section 19 (2) of the Flood and Water Management Act 2010, to publish the results and notify the relevant risk management authorities (RMAs).

Section 19 Local authorities: investigations

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

> *(a) which risk management authorities have relevant flood risk management functions, and*
>
> *(b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.*

(2) Where an authority carries out an investigation under subsection (1) it must—

> *(a) publish the results of its investigation, and*
>
> *(b) notify any relevant risk management authorities*

Criteria for an investigation (as per Appendix D of the Suffolk Flood Risk Management Strategy):	
There was a risk to life because of flooding?	
Internal flooding of one property (domestic or business) has been experienced on more than one occasion?	
Internal flooding of five properties has been experienced during one single flood incident	✓
Where a major transport route was closed for more than 10 hours because of flooding	
Critical infrastructure was affected by flooding	
There is ambiguity surrounding the source or responsibility of a flood incident	

Understanding the flood context

1. What happened during Storm Babet

A succession of weather fronts between the 11th and 13th of October 2023 brought significant rainfall to the region. Readings indicate that between 30mm and 50mm of rain fell across Suffolk compared with an average of just less than 65mm across the whole month of October according to Meteorological Office weather data (Met Office, 1991- 2020). This significant rainfall in a short space of time resulted in saturated land and rivers reaching their capacity. Shortly after this, Storm Babet followed on the 18th to 21st of October 2023. The storm brought between 50 mm and 80 mm of rain to much of central and northern East Anglia, with some Suffolk weather stations recording the wettest October day on record.

The Environment Agency River level gauging stations indicated many flows close to or exceeding their highest on record, and the weather remained wetter than average for the rest of the month. October 2023 was the joint wettest on record in the east of England since 1871. During Storm Babet, Suffolk saw the heaviest rainfall across East Anglia causing significant flooding of roads and properties. The river systems rose rapidly across whole catchments due to the existing conditions, which was unusual as storms will often impact a small area and result in a steady progression of floodwater downstream. A major incident was declared by Suffolk Resilience Forum (SRF) in the afternoon of the 20th of October due to significant impacts on communities and disruption to the road and rail networks.

The following maps illustrate the extent to which the rainfall in the months preceding Storm Babet exceeded the average monthly rainfall for July to October in recent years in Suffolk.

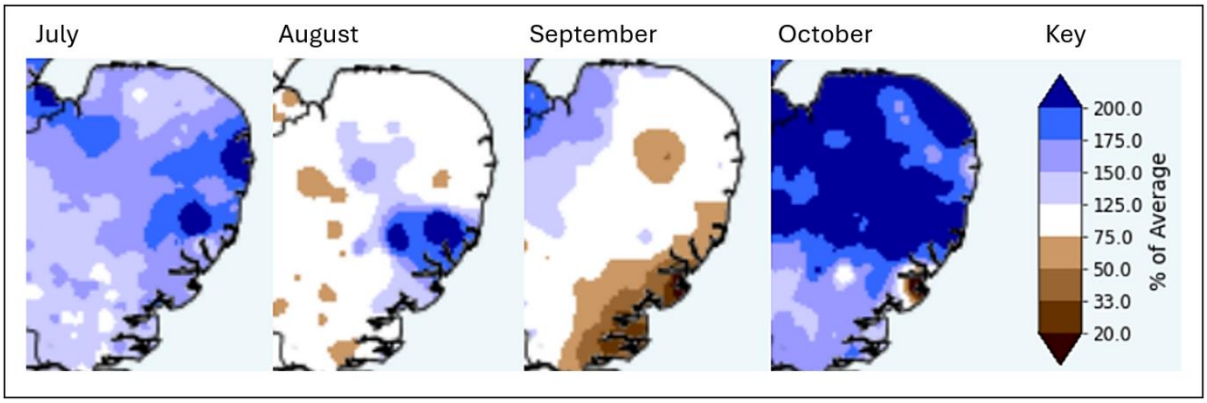

Figure 1. Average monthly rainfall (July – October 2023) as a percentage of the historic average monthly rainfall

The following report acknowledges that October 2023 and particularly Storm Babet, was an extreme event and will assess the probable causes and impacts. The report will recommend measures to reduce the risk of flooding within the location, in line with best practice, ranging from large to small scale interventions and be targeted at a range of stakeholders. It should be noted that Storm Babet was a significant event,

with a low probability of recurrence. The recommendations will provide advice about reducing flood risk. However, they should not be relied upon as a guaranteed failsafe to mitigate against all future flooding.

2. Location of flooding

The town of Stowmarket is located in the district of Babergh and Mid Suffolk, approximately 11 miles northwest of Ipswich and on the west side of the A14.

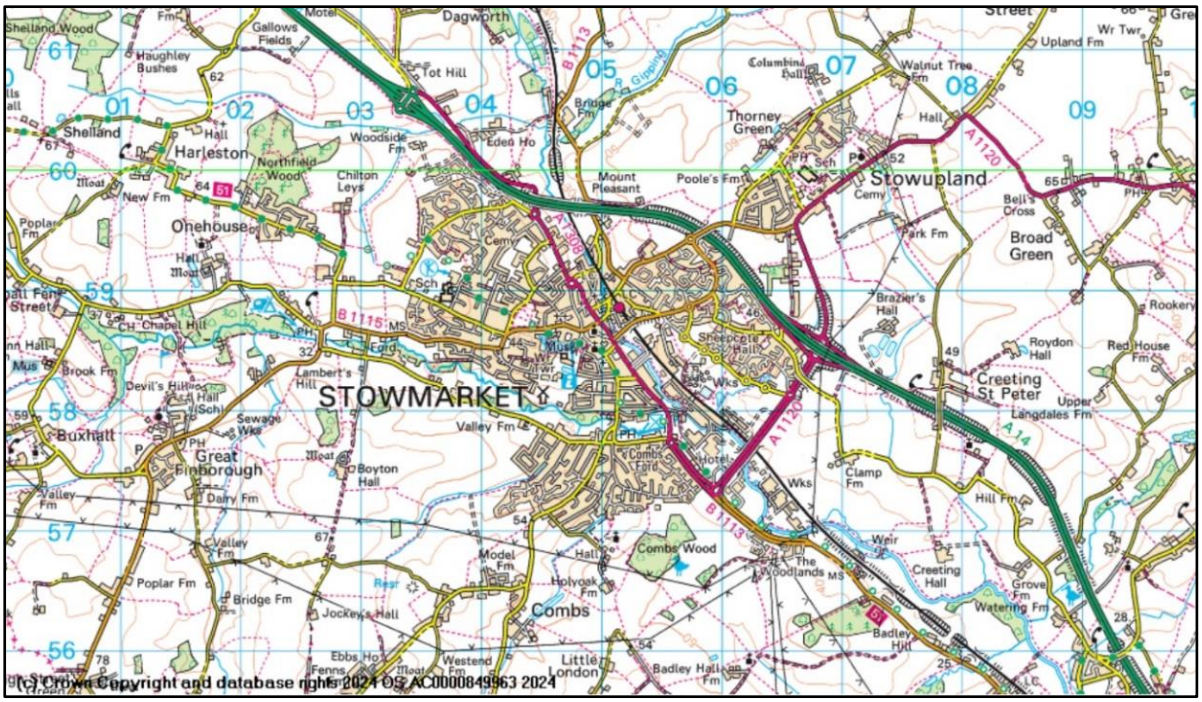

Figure 2. Investigation area map

Figure 3 shows the statutory main rivers in and around Stowmarket. These include the River Gipping (flowing from the north) and the Rattlesden River (flowing from the west) which join in Stowmarket. Stowmarket is the confluence for a number of tributaries which also flow into the River Rattlesden from the south. These include Combs Beck and Edgars Farm Drain.

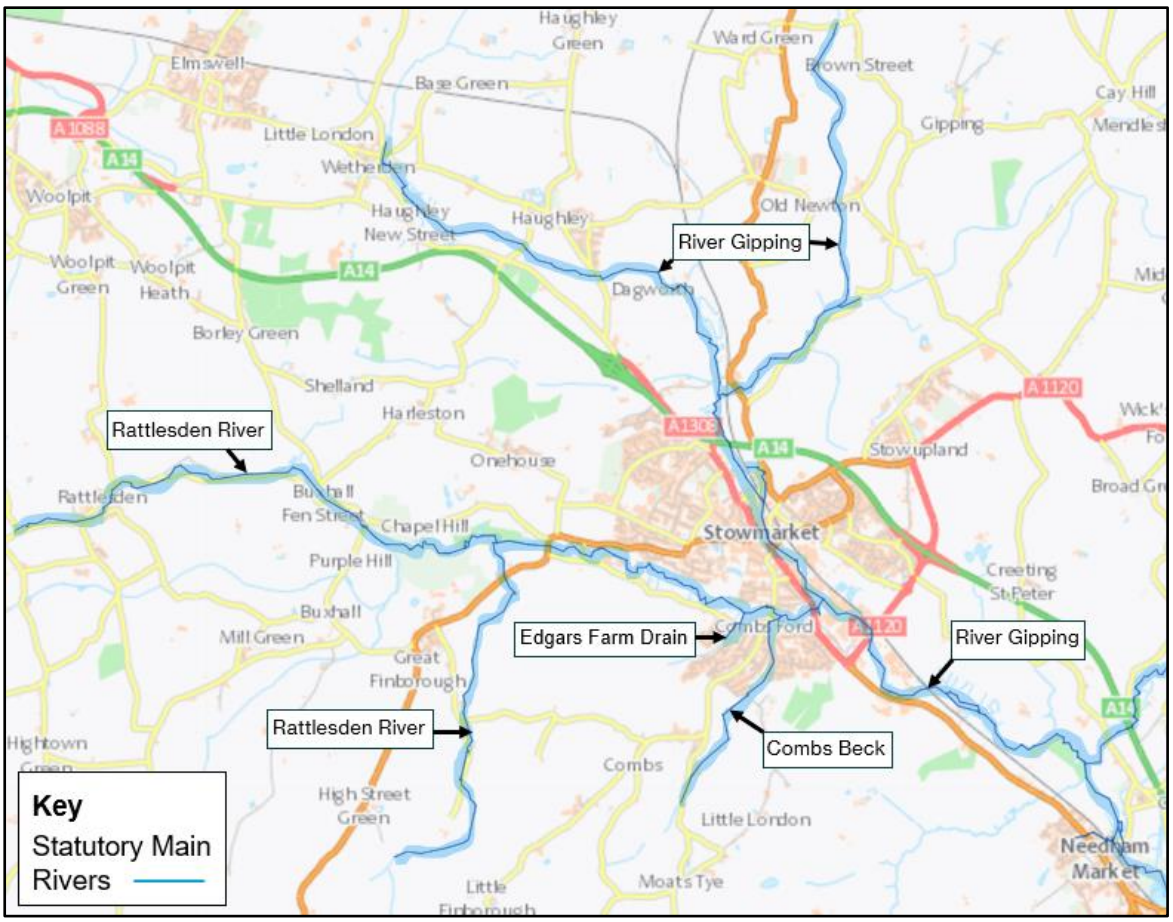

Figure 3. Location of statutory main rivers

The Environment Agency has permissive powers to carry out maintenance, improvement or construction work on statutory main rivers to manage flood risk. Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards (IDBs) manage the flood risk from ordinary watercourses but responsibility for maintaining watercourses rests with the riparian landowner, defined as those who have a river, stream or ditch which runs next to or through their land or property.

On the 20th October 2023, Storm Babet resulted in significant rainfall across Suffolk on already saturated ground due to above average rainfall in the preceding weeks. Stowmarket was significantly impacted with approximately 22 properties being flooded. The A1120 between Gun Cotton Way and the A14 was also reported to have flooded. Floodwater was described as coming from several sources including the overtopping of local watercourses (fluvial) and overwhelmed drainage systems and

surface water runoff from surrounding fields (pluvial). Within this report, the term 'floodwater' may be used to describe all types of flooding.

It should be noted that reports of sewer flooding were investigated and could not be confirmed, or were attributed to comprehensively overwhelmed surface water drainage systems due to the extreme rainfall rather than specific Anglian Water system failures.

Property was reported as flooding internally in ten locations across the town and for the purposes of this investigation they will be described by road name, except for Combs Ford, which refers to the area:

1. Cardinalls Road
2. Regent Street
3. Stowupland Street
4. Station Road East
5. Purcell Road
6. Needham Road
7. Combs Ford
8. Bramford Court
9. Lindsey Way
10. Danescourt Avenue

The A1120 near the A14 junction was also partially closed by flooding.

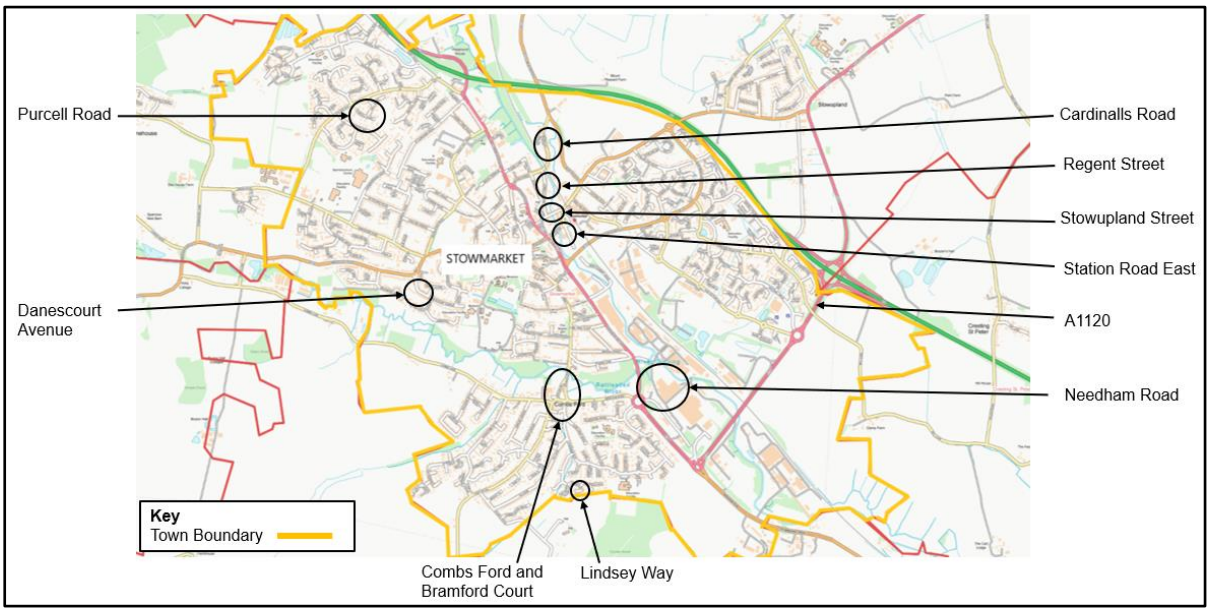

Figure 4. Locations where internal flooding of property was reported or major infrastructure was affected by flooding (A1120)

3. Records of any historical flooding

Suffolk County Council's Highways reporting tool, local and social media reports were reviewed as part of this report.

The Environment Agency hold the following historic flood records for the town of Stowmarket:

- February 1st -4th 1979: fluvial flood event recorded due to snowmelt, numbers unknown.
- January 1985: fluvial flood event recorded due to snowmelt, numbers unknown.
- August 20th – 26th 1987: six properties are recorded as flooded from fluvial sources in the areas of Cardinals Road, Regent Street and Station Road, with impacts experienced across the town. January 24th – February 2md 1988: reports of properties flooding from fluvial sources in Regents Street, numbers unknown.
- October 11th-15th 1993: two properties are reported to have flooded from fluvial sources.
- October 2000: two properties are reported to have flooded from fluvial sources.
- 26th April – 3rd May 2012: properties reported to have flooded from heavy rainfall, properties flooded in Cardinals Road area, numbers unknown.

4. Predicted Flood Risk

Fluvial flood risk in Stowmarket is associated primarily with the River Gipping, Rattlesden River and Combs Beck (Figure 5). This corresponds with affected property in Cardinalls Road, Regent Street, Stowupland Street, Station Road East, Combs Ford, Bramford Court and Needham Road where flooding was attributed by residents to be partly or entirely due to fluvial flooding. Affected properties were projected to be in the high fluvial flood risk areas.

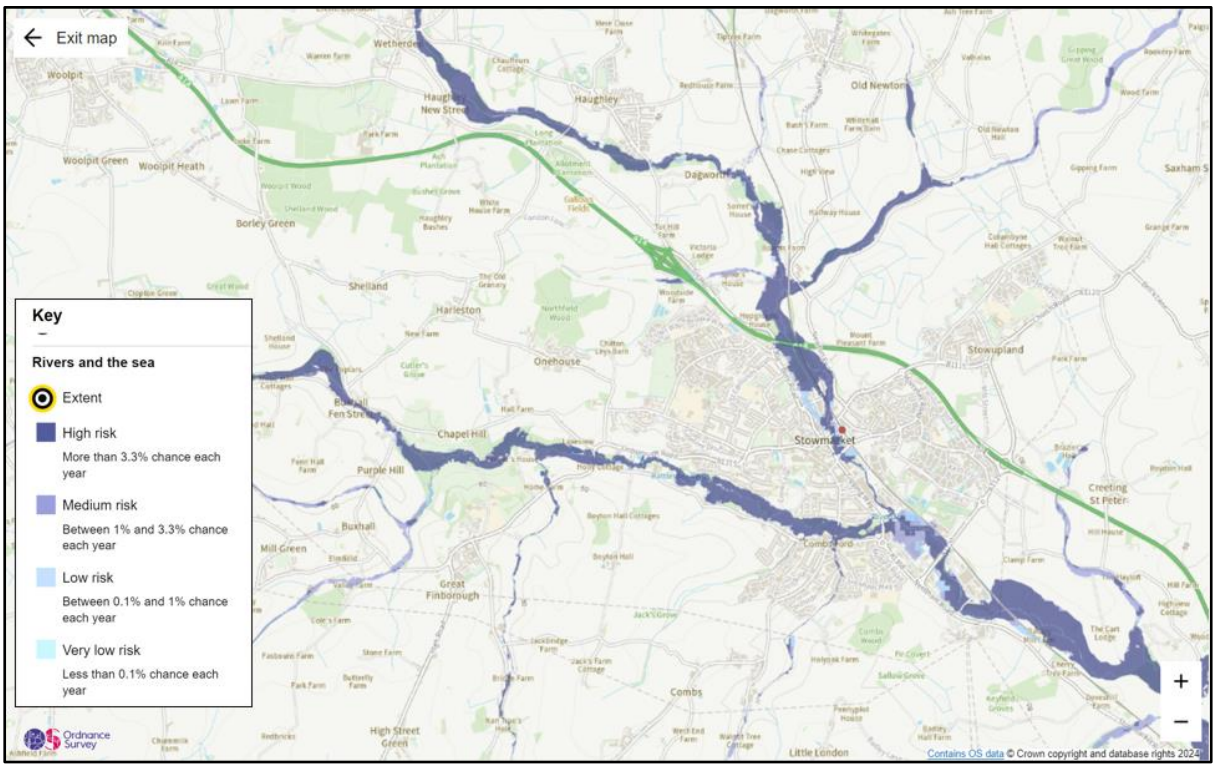

Figure 5. Predicted flood risk from river water (fluvial)

Stowmarket has significant surface water flow paths, predominantly channelling water from the south to the Rattlesden River and from the west, north and east towards the River Gipping (Figure 6). These flowpaths are associated with areas of surface water flood risk. There are also some isolated areas in the town predicted to be at surface water flood risk which are associated with low-lying locations where floodwater typically collects during a rainfall event.

Affected property in Cardinalls Road, Regent Street, Stowupland Street, Station Road East, Lindsey Way, Combs Ford, Bramford Court, Needham Road and Purcell Road was in areas predicted to be at risk of surface water flooding. The flooded section of the A1120 was also predicted to be at high risk of surface water flooding.

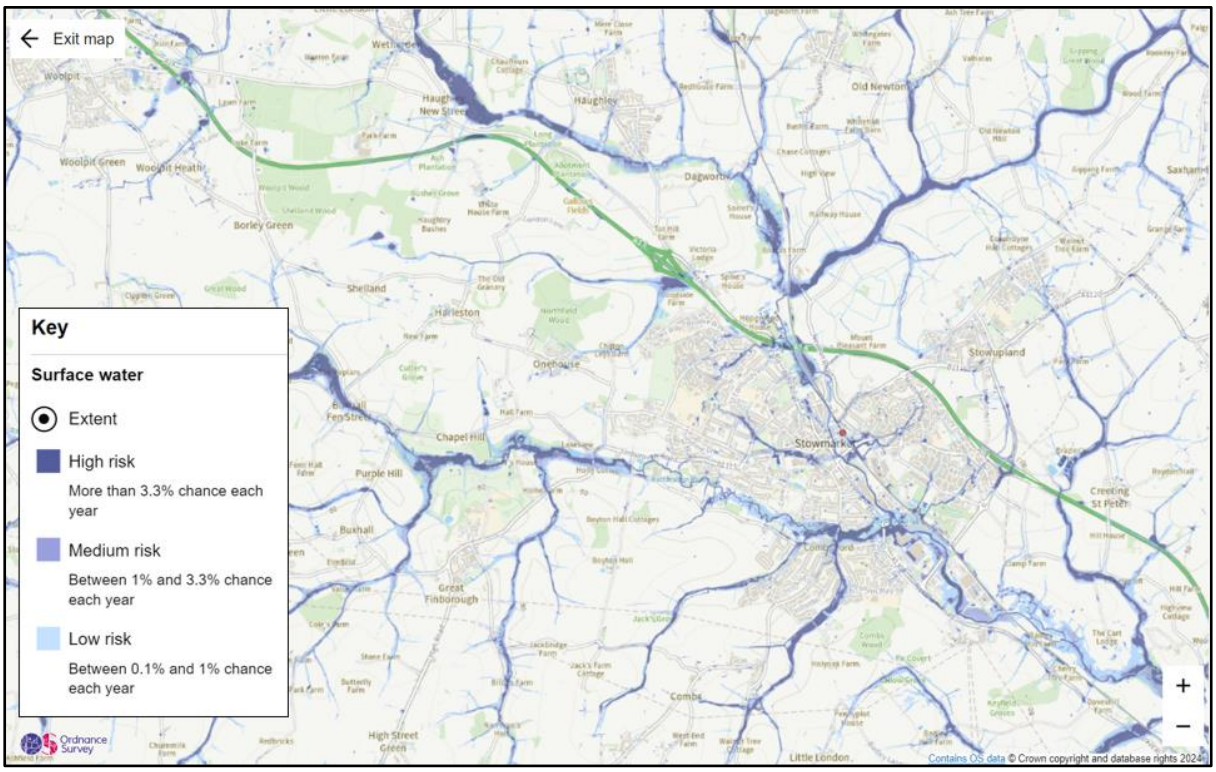

Figure 6. Predicted flood risk from surface water (pluvial)

The Environment Agency operates, inspects and maintains Rattlesden Flood Storage Reservoir which is located upstream of Stowmarket at Burford Bridge on the Rattlesden River. It is designed to store floodwater which overtops from the river during high rainfall events and has an autonomous outlet control structure which operates based on local river level data. During Storm Babet, the feature was reported to be functioning and storing floodwater as designed but due to the amount of rainfall received, it exceeded its storage capacity of 25,000m^3. This meant that floodwater overtopped the designed spillway embankment onto Finborough Road and flowed southeast, joining the Rattlesden River and its floodplain. The Environment Agency operates, inspects and maintains a second Flood Storage Reservoir on the River Gipping (storage capacity 102,000m^3) located upstream of Stowmarket off the A1308, north of the A14. This Flood Storage Reservoir also continued to function during Storm Babet, attenuating floodwater as designed and its capacity was not exceeded during the event. Without the presence of these flood storage reservoirs the impacts of flooding would have been greater.

All locations where property was affected, except for one, were closely aligned with the national predicted flood risk maps. Property in Danescourt Avenue was impacted during Storm Babet but it is not predicted to be at fluvial or pluvial flood risk.

5. Catchment characteristics

Stowmarket is an urban area situated on low lying land in the upper River Gipping catchment, which also includes the Rattlesden River and Combs Beck (Figure 7). Combs Beck joins the Rattlesden River in Stowmarket, which then converges with the

River Gipping, also in Stowmarket. The catchment is predominantly rural with mainly arable land. There is minimal natural storage within the catchment and the river levels rise quickly in response to high rainfall. Overwhelmed infrastructure and watercourses may be observed during these intense rainfall events. The River Gipping in Stowmarket has been heavily modified historically to allow for construction and navigation.

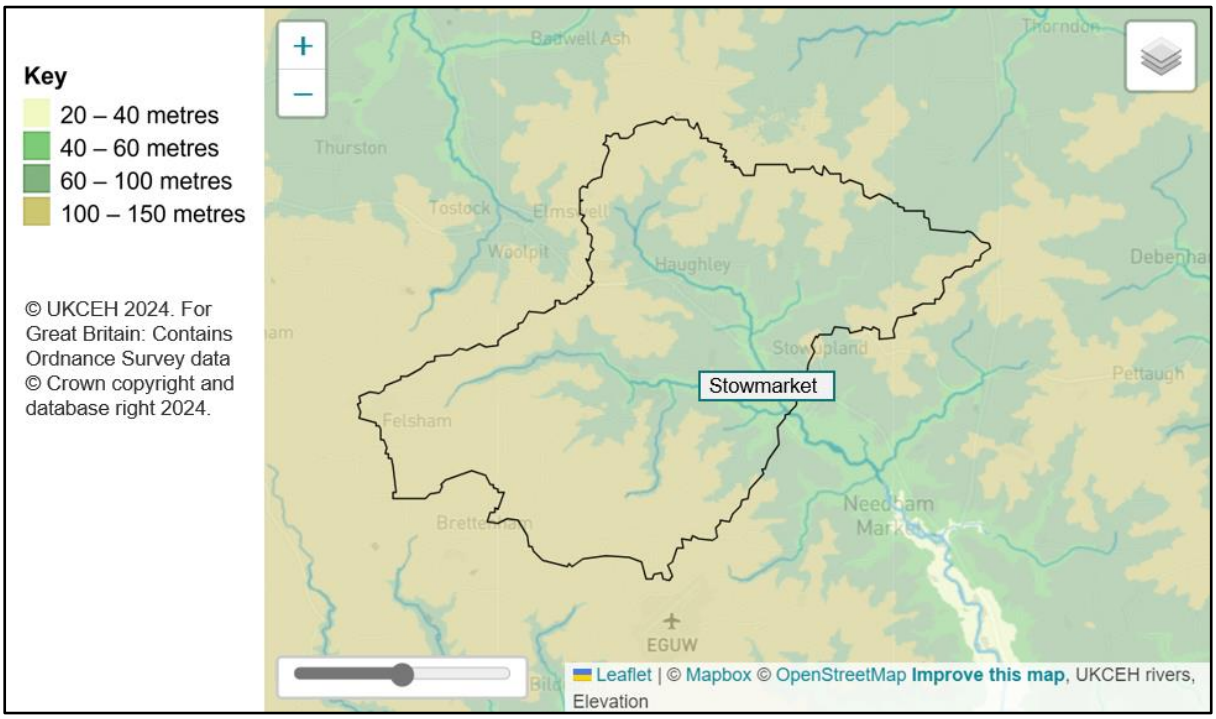

Figure 7. Elevation map of catchment area (National River Flow Archive)

The soils surrounding Stowmarket are predominantly loamy and clayey with impeded drainage, meaning that water permeates more slowly and surface water runoff is greater, particularly during intense rainfall. However, the saturated nature of the soils leading up to Storm Babet would also have prevented some infiltration (Fig. 8).

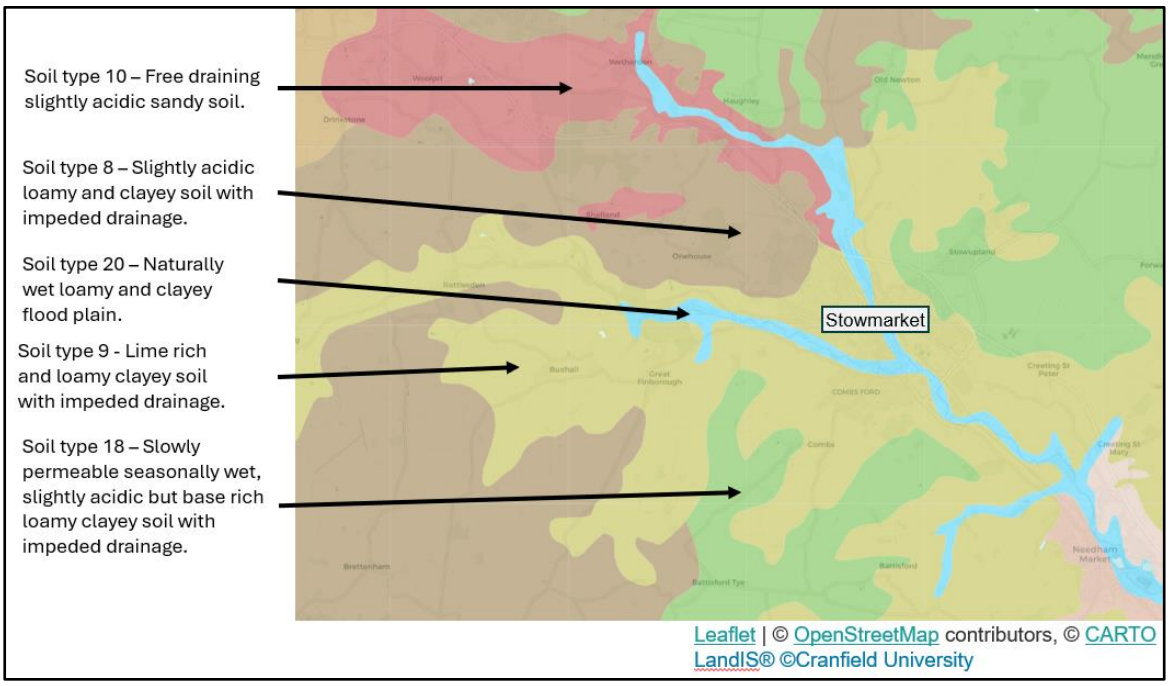

Figure 8. Soil map of catchment area (LandIS Soilscapes)

Figure 9 shows that much of the superficial geology surrounding Stowmarket is made up of 'Lowestoft Formation – Diamicton' which is described by the British Geological Survey as a diverse mixture of clay, sand, gravel, and boulders varying widely in size and shape. This is sometimes known as boulder clay. This generally has a low permeability meaning water will tend to flow off it before it can infiltrate, which also reflects the reports collected during Storm Babet.

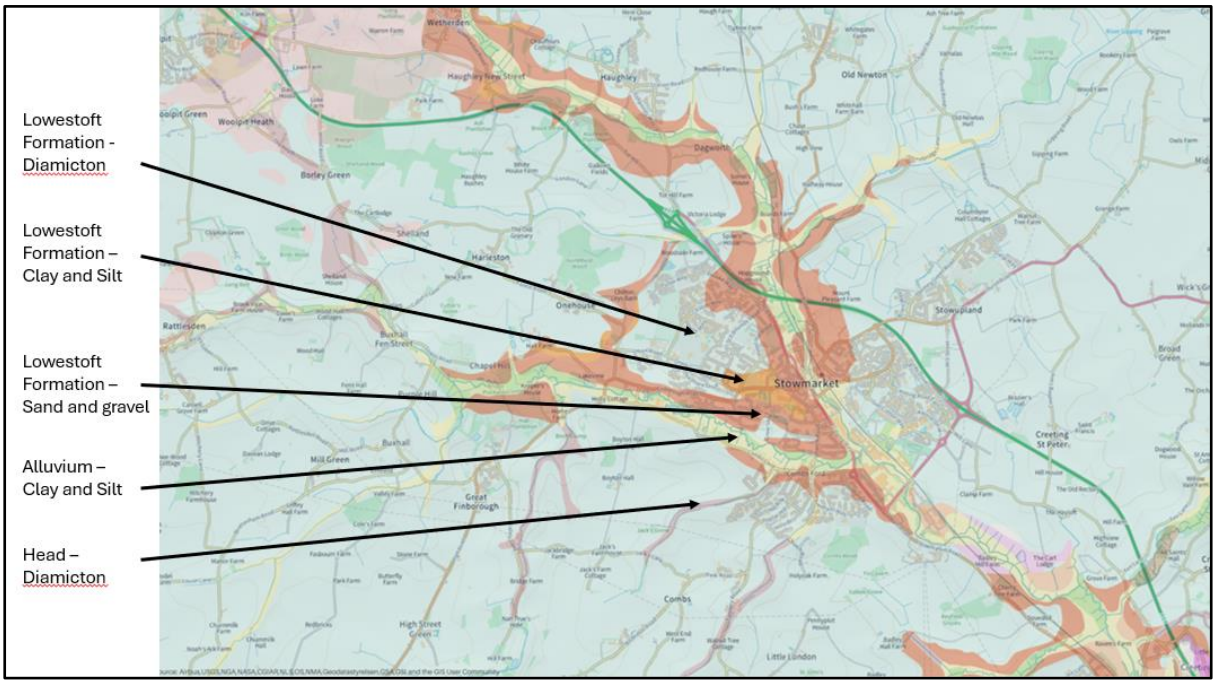

Figure 9. Superficial geology (BGS Viewer)

The bedrock in Stowmarket and in the surrounding upstream area of the catchment is predominantly Crag Group - Sand which is relatively permeable. However, during short term intense rainfall events, soil composition and superficial geology become more influential in affecting the volume of surface water runoff. Combined with the topography within the catchment, this makes Stowmarket susceptible to extreme rainfall events. Saturated ground conditions like that of Storm Babet and a high concentration of hard surfaces in an urban setting will further emphasise the vulnerability of the town and localised flooding could be experienced.

Flooding Sources, Pathways & Receptors

Storm Babet was an extreme event which came at a time when Suffolk had experienced a significant amount of rainfall in the preceding weeks.

The description of the flood events described below will discuss the probable sources of flooding, the observed flow paths through the community and the receptors which have been affected. The term 'floodwater' may be used to describe both fluvial (water from a watercourse) and pluvial (surface water run-off) flooding.

Data from surrounding Environment Agency rain gauges indicates that a significant volume of rain was experienced during Storm Babet. The nearest rainfall gauge to Stowmarket is Great Finborough. It recorded 51.4mm of rainfall on 20th October 2023, of which 49.2mm fell by 3.30pm. The Environment Agency monitoring station on the River Gipping in Stowmarket recorded the river level as 0.42m and flow as 1.6m^3/s at 00.45am on 20th October and recorded the river level peaking at 1.75m and the flow as 36.07m^3/s at 23.00 on 20th October. This means that in Storm Babet, during a period of nearly 24 hours, River Gipping water levels rose by 1.33m at the gauging station and the risk of the river overtopping and flooding adjacent areas in Stowmarket increased considerably. Given the significant volume of rain experienced and resultant flows the floodplain will always need to be utilised in this scenario.

The Environment Agency issue two types of warning when flooding is possible from a main river. These are:

1. Flood Alert – Flooding is possible. Be prepared. - usually issued between 2 and 12 hours before flooding.

2. Flood Warning - Flooding is expected. Immediate action required – usually issued 30 minutes to 2 hours before flooding.

The extensive Flood Alert Area of the Rivers Rattlesden and Gipping includes areas of Stowmarket which are at risk of fluvial flooding from the main rivers Rattlesden and Gipping. A Flood Alert for this area was issued on 20th October 2023 at 03:27am and remained in force until it was removed on 24th October 2023.

There are two Flood Warning Areas within Stowmarket. The Flood warning for the area of “The Rattlesden River from Rattlesden to Combs Ford in Stowmarket” was issued on 20th October 2023 at 11:13am and remained in force until 22nd October at 12:35pm.

A Flood Warning for the area of “The River Gipping from A14 at Stowmarket to upstream of Needham Market” was issued on 20th October 2023 at 19:29pm and was in force until it was removed on 22nd October at 12:22pm.

The description of the flood events outlined below has been prepared using reports submitted to Suffolk County Council via the online Highways Reporting Tool and information gathered by Risk Management Authorities (RMAs), community information and site visits. Detailed descriptions of each investigation area can be found in the following section.

North Stowmarket

Projected areas of surface water and rivers flood risk for north Stowmarket (including Cardinalls Road, Regent Street, Stowupland Street, Station Road East and Purcell Road) are shown in Figures 10 and 11. Fluvial flooding in north Stowmarket is associated with Cardinalls Drain and the River Gipping. Approximately four residential properties and one commercial property were impacted within this area.

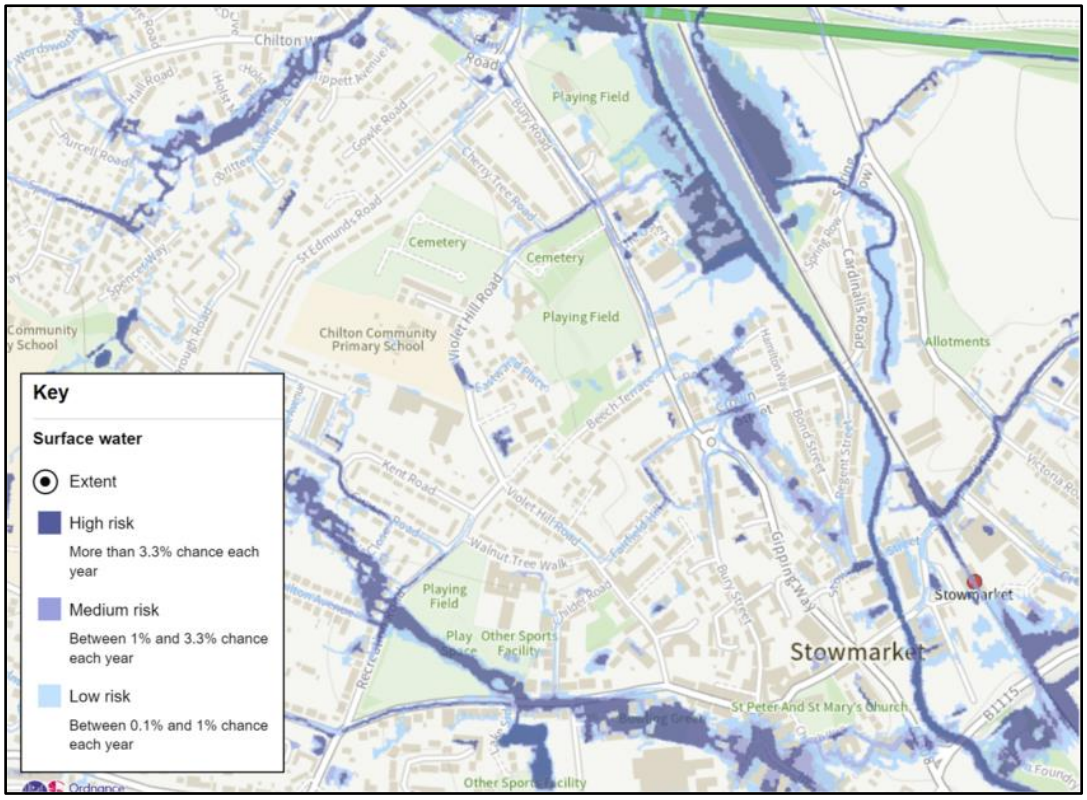

Figure 10 Predicted flood risk from surface water (pluvial) in north Stowmarket

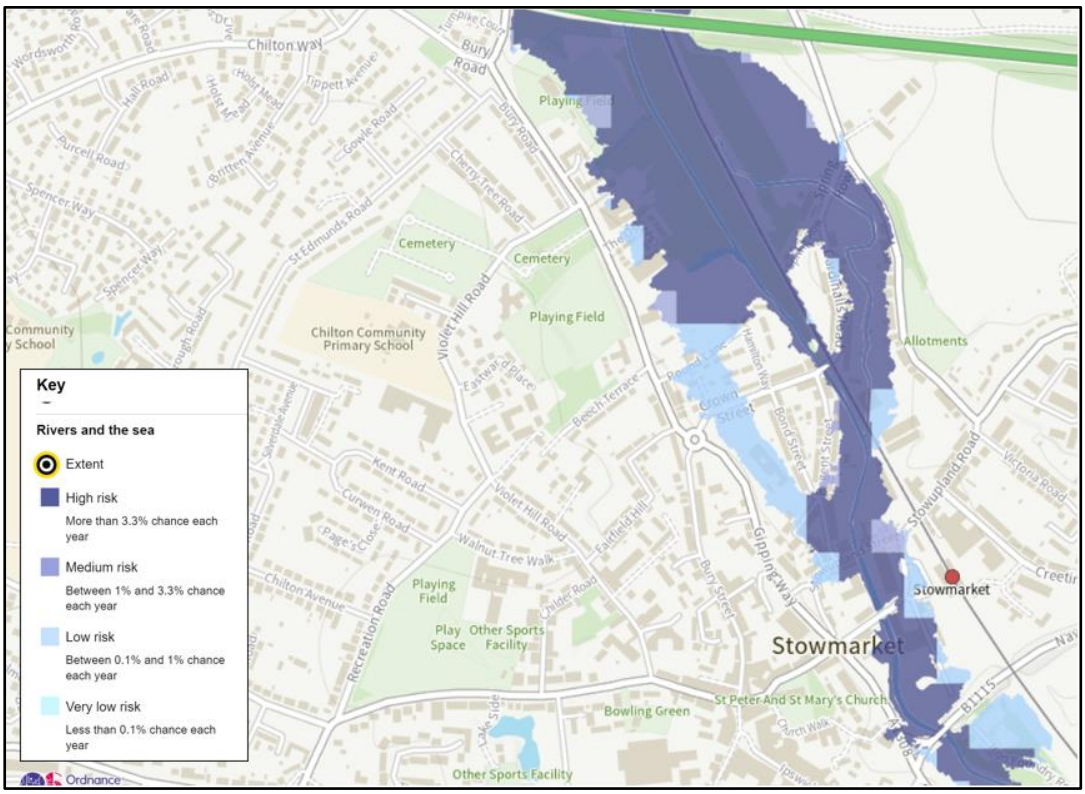

Figure 11 Predicted flood risk from river water (fluvial) in north Stowmarket

Descriptions of each investigation area in north Stowmarket are detailed below.

1. Cardinalls Road

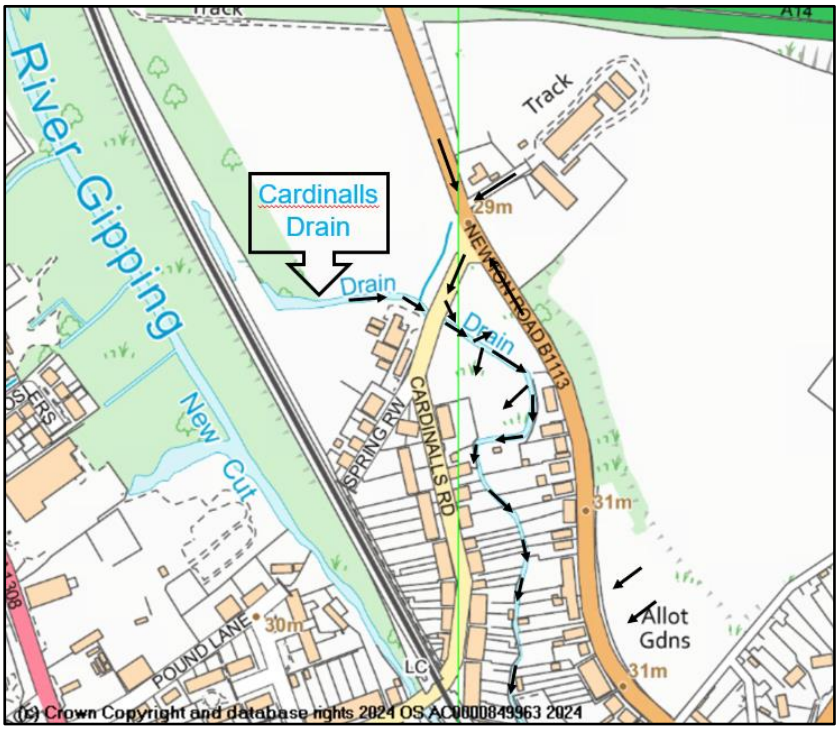

Figure 12 Cardinalls Road approximate floodwater flowpaths

Cardinalls Road is the northernmost road to suffer with internal flooding of property during Storm Babet. The affected property is projected to be at high risk of fluvial flooding and low risk of pluvial flooding, with water flow coming predominantly from the river, rather than overland run off. During Storm Babet, intense and prolonged rainfall caused Cardinalls Drain to exceed its current capacity and overtop its banks to the rear of Cardinalls Road, resulting in internal flooding to property. Silt build-up has reduced the capacity of Cardinalls Drain.

Cardinalls Drain flows from north of Spring Row, behind properties in Cardinalls Road and is then pumped under the railway line at the lower end of Cardinalls Road to join the River Gipping. The pumps are an Environment Agency asset and there are two automated pumps configured to pump fluvial water into the main river Gipping from Cardinalls Road drain in periods of high flow. The pumps remained in working order but were unable to convey water to the River Gipping due to the elevated water levels in the River Gipping.

In summary:

- Intense and prolonged rainfall exceeded the capacity of Cardinalls Drain, causing it to overtop its banks and flood adjacent property from the rear of Cardinalls Road.
- Silt build-up has reduced the capacity of Cardinalls Drain.
- The pumps were unable to convey water to the River Gipping due to the elevated water levels in the River Gipping.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Residents to report obstructions in Cardinalls Drain to the Environment Agency.
- Landowners to undertake targeted maintenance of Cardinalls Drain between Spring Row and the Pump at the lower end of Cardinalls Road as per riparian responsibilities.
- Relevant authority to inform landowners of riparian responsibilities.

2. Regent Street

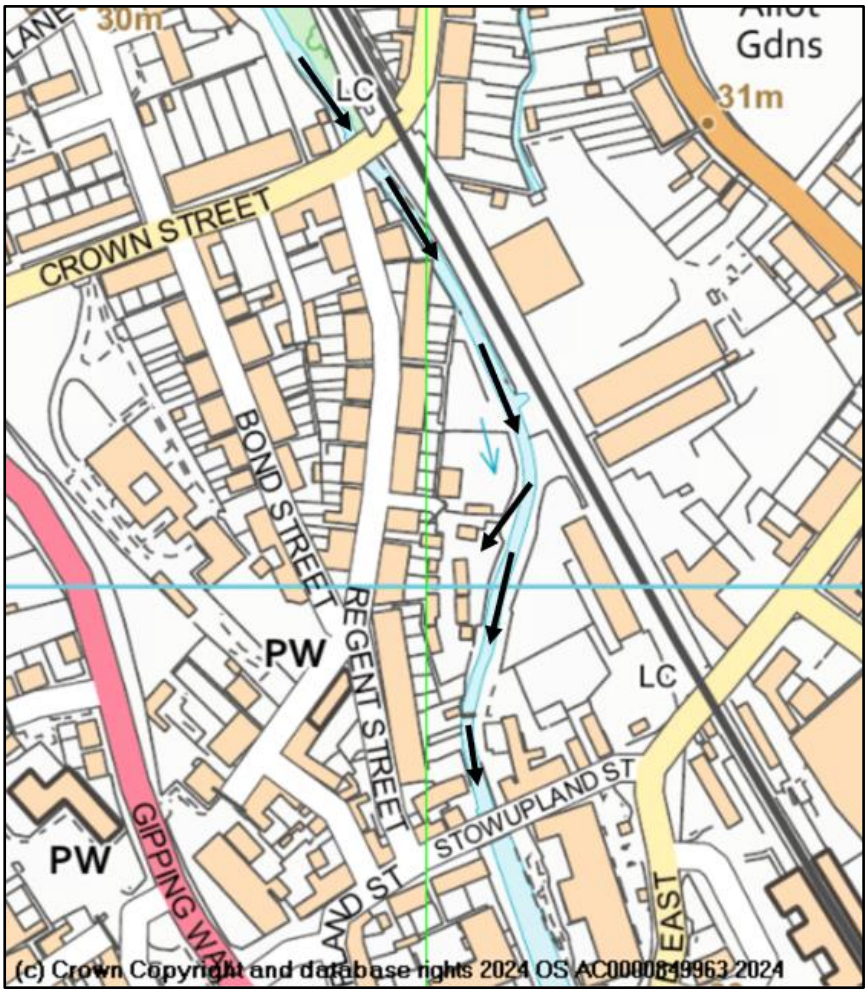

Figure 13 Regent Street approximate floodwater flowpaths

The River Gipping flows south behind properties on Regent Street. It is joined near the northern end of this stretch by water pumped into it from Cardinalls Drain. Affected property in Regent Street is projected to be at high risk of fluvial flooding and low risk of pluvial flooding with water flow coming predominantly from the river, rather than overland run off.

During Storm Babet, the River Gipping exceeded capacity and overtopped its banks to the rear of Regent Street, causing internal flooding to low-lying property, reported at 50cm internally.

In summary:

- Intense and prolonged rainfall exceeded the capacity of the River Gipping, causing it to overtop its banks and flood adjacent low-lying property from the rear of Regent Street.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Residents to report obstructions in the watercourse to the Environment Agency.
- Relevant authority to inform landowners of riparian responsibilities.
- Explore the potential for NFM measures which aim to attenuate surface water in the upper catchment of the River Gipping.

3. Stowupland Street and 4.Station Road East

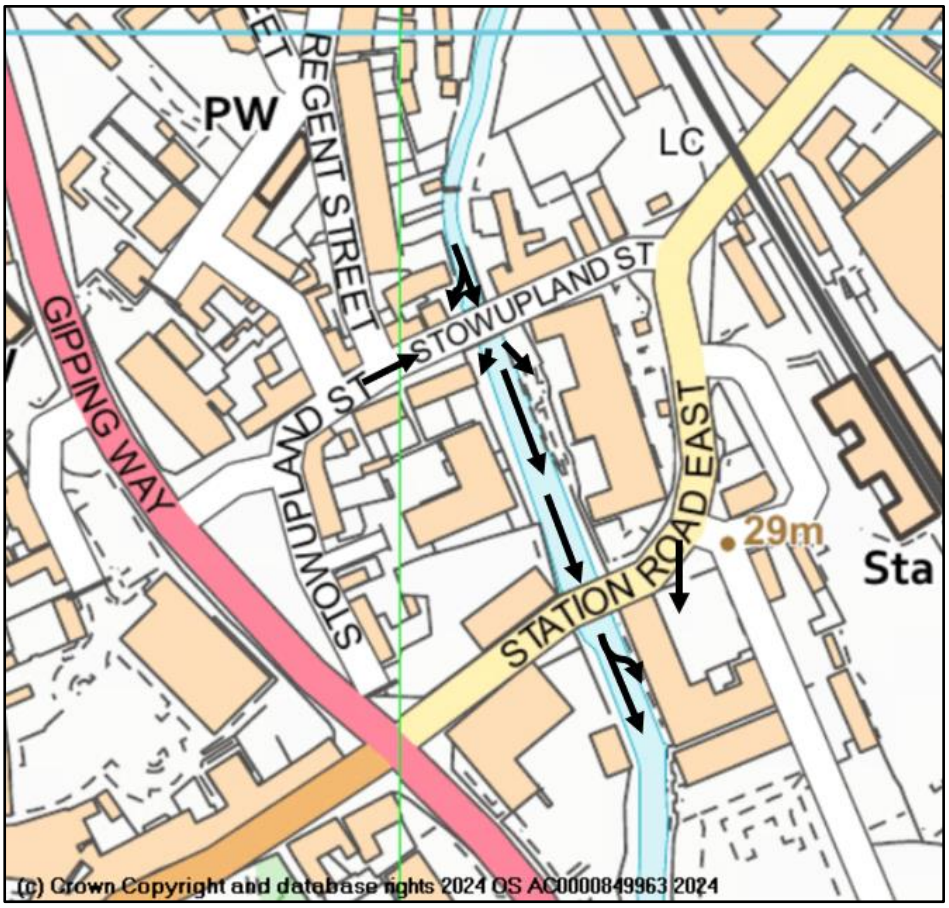

Figure 14 Stowupland Street and Station Road East approximate floodwater flowpaths

Affected property in Stowupland Street and Station Road East is projected to be at high risk of fluvial and pluvial flooding with water flow coming from the river and overland run off.

Property in Stowupland Street, to the west of the River Gipping, was reported as flooding due to the River Gipping exceeding capacity and overtopping its banks. Surface water also flowed down Stowupland Street and collected at the low point adjacent to the bridge.

The River Gipping was also reported as exceeding capacity, overtopping and flooding property to the east of the bridge on Station Road East. This was further exacerbated by surface water flowing southwest off Station Road East. The surface water from

properties, which usually discharges into the river via drainage outlet systems, was unable to discharge into the river due to river levels rising above the outfalls. River levels were reported as reaching 0.9m above threshold height and consequently flowing into property. Property in this area has flooded subsequently multiple times.

In summary:

- Intense and prolonged rainfall exceeded the capacity of the River Gipping, causing it to overtop its banks and flood adjacent property to the west on Stowupland Street and to the east on Station Road East.
- Surface water also flowed down Stowupland Street, collecting by the bridge.
- Flooding on Station Road East was compounded by surface water flowing southwest from the road.
- Surface water was unable to discharge from property on Station Road East into the River Gipping due to the outfalls being submerged by the River Gipping.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Residents to report obstructions in the watercourse to the Environment Agency.
- Relevant authority to inform landowners of riparian responsibilities
- Explore the potential for NFM measures which aim to attenuate surface water in the upper catchment of the River Gipping.

5. Purcell Road

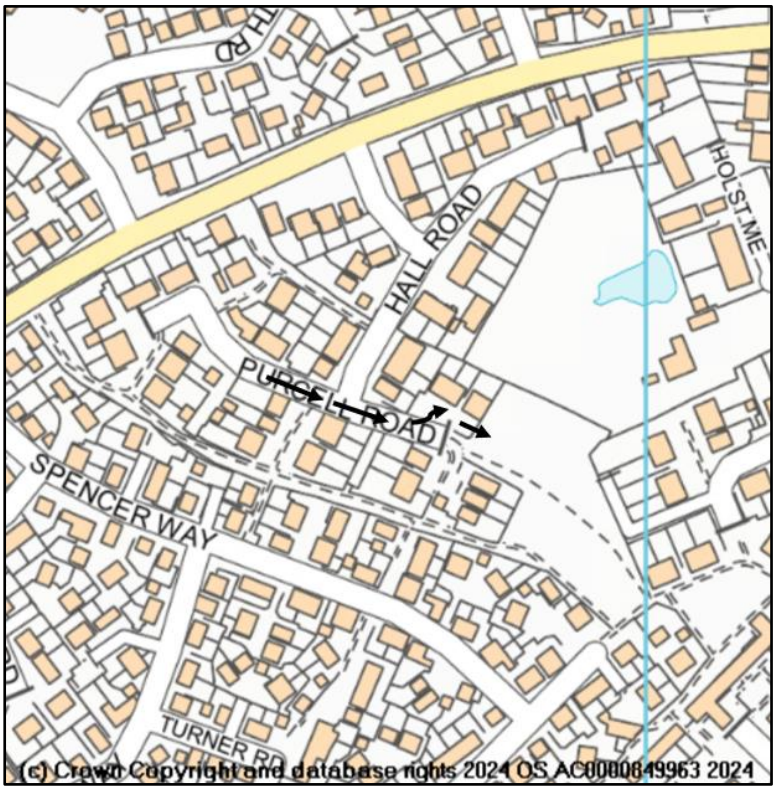

Figure 15 Purcell Road approximate floodwater flowpaths

Affected property in Purcell Road suffered internal flooding from surface water on the highway. The area is projected to be at medium surface water flood risk and during the event, residents reported that highways drainage was overwhelmed, unable to cope with the volume of floodwater. Surface water flowed down Purcell Road, travelling west to east, towards properties situated at a lower level, causing internal property flooding when floodwater breached property thresholds.

In summary:

- Surface water flowed down Purcell Road, flooding property at the lower end of Purcell Road.
- Highways drainage was overwhelmed.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Suffolk County Council Highways to ensure completion of cyclic maintenance of highway gullies on Purcell Road.

South Stowmarket

Predicted areas of surface water and rivers flood risk for south Stowmarket (including Needham Road, Combs Ford, Bramford Court, Danescourt Avenue, Lindsey Way and the A1120) are shown in Figures 16 and 17. Fluvial flooding in south Stowmarket is associated with the River Gipping, Rattlesden River and Combs Beck. Approximately five commercial properties and twelve residential properties were impacted within this area.

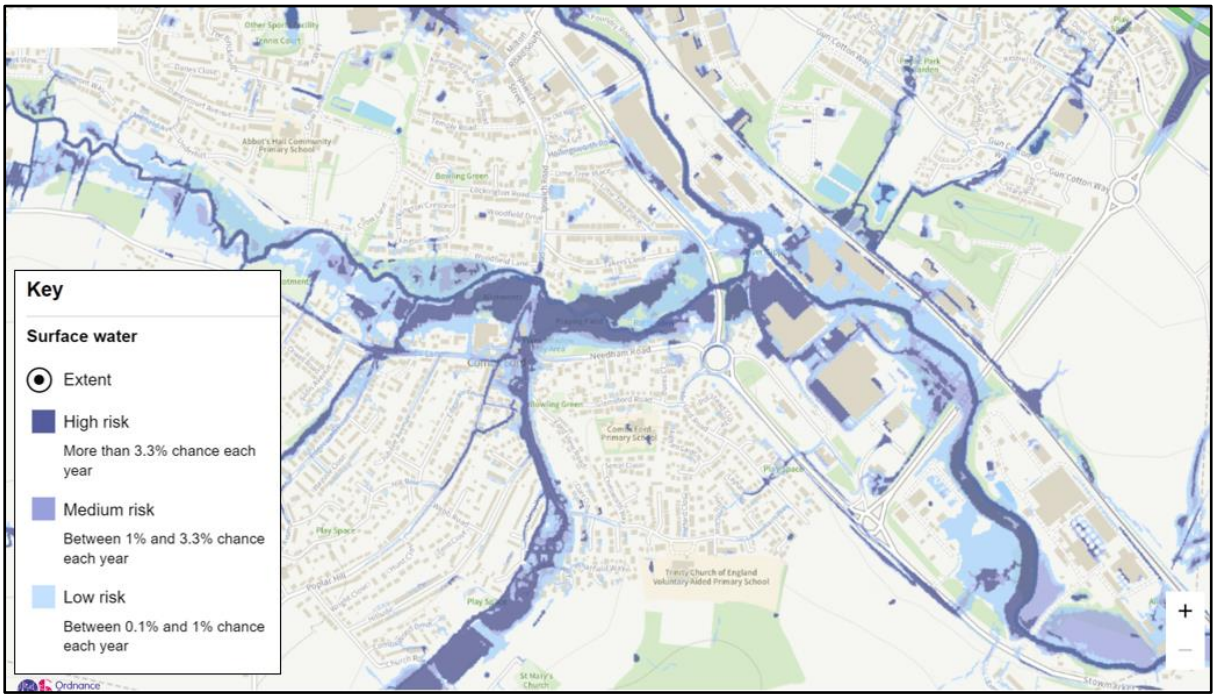

Figure 16 Predicted flood risk from surface water (pluvial) in south Stowmarket

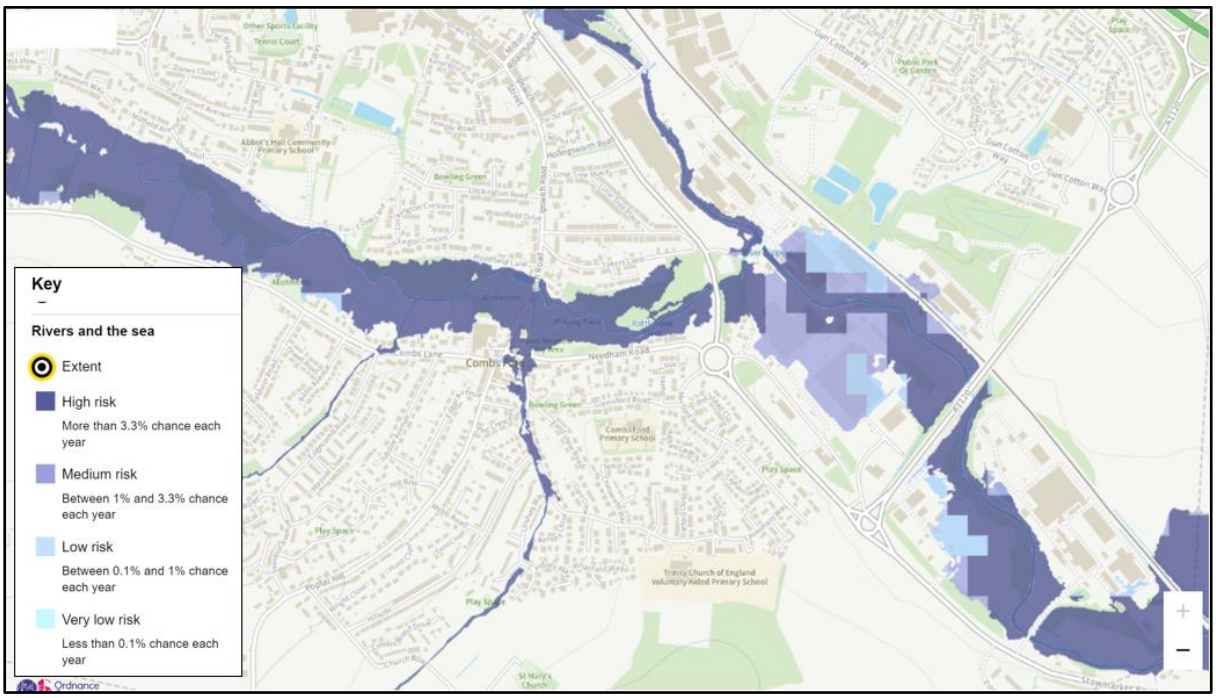

Figure 17 Predicted flood risk from river water (fluvial) in south Stowmarket

6. Needham Road

Residential and commercial property were both affected in this area and will be discussed separately below.

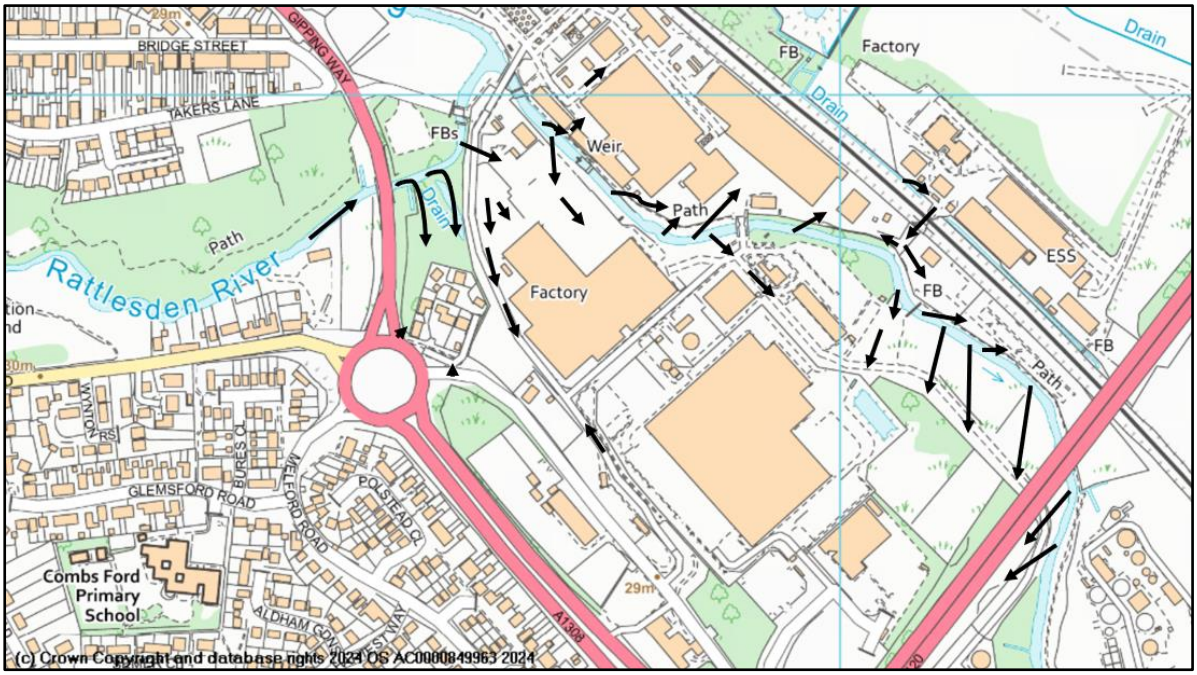

Figure 18 Needham Road approximate floodwater flowpaths for residential and commercial property

Commercial property to the east of the Gipping Way/Needham Road roundabout was impacted by flooding. Affected property in this location is predicted to be at high fluvial and pluvial flood risk, with water flow coming from rivers and overland run off.

At 2pm on 20th October 2023, floodwater was reported as exceeding the capacity of drains on the east side of the railway line and flowing southwest through an underpass beneath the railway line and on to the site, flooding eastern areas between the River Gipping and the railway. By 8pm, the River Gipping had overtopped adjacent to this area, contributing to flooding on the east and southeast side of the site. Roads on this side of the site are known to be vulnerable to flooding and are reported to flood typically 1-2 times per year. At 8pm, internal flooding, also caused by the River Gipping overtopping, was reported on the northeast of the site, close to the confluence of the Rattlesden River and the River Gipping. At 10pm, the River Rattlesden was also reported as overtopping and flooding the northwest of the site. Surface water also accumulated on the site due to the considerable amount of hard impermeable surfaces. Floodwater continued to rise on the site, causing further internal flooding until 2.30am on 21st October, when levels began to subside.

In summary:

- Intense and prolonged rainfall exceeded the capacity of drains to the east of the railway line, causing water to flow southwest through an underpass below the railway line, flooding storage areas at 2pm on 20th October 2023.
- The River Gipping then overtopped, flooding the more extreme east and southeast areas of the site and the extreme northeast area at 8pm.
- This was followed by the Rattlesden River overtopping, contributing to flooding on the northwest of the site from 10pm.
- Surface water also collected on the site.
- Floodwater continued to rise until 2.30am on the 21st October, when it began to subside.

Recommendations:

- Business to install Property Flood Resilience (PFR) via grant funded scheme.
- Business to report obstructions in the Rattlesden River and River Gipping to the Environment Agency.
- Relevant authority to inform landowners of riparian responsibilities.
- Explore the potential for NFM measures which aim to attenuate surface water in the upper catchment of the Rattlesden River.
- Explore the potential for NFM measures which aim to attenuate surface water in the upper catchment of the River Gipping.

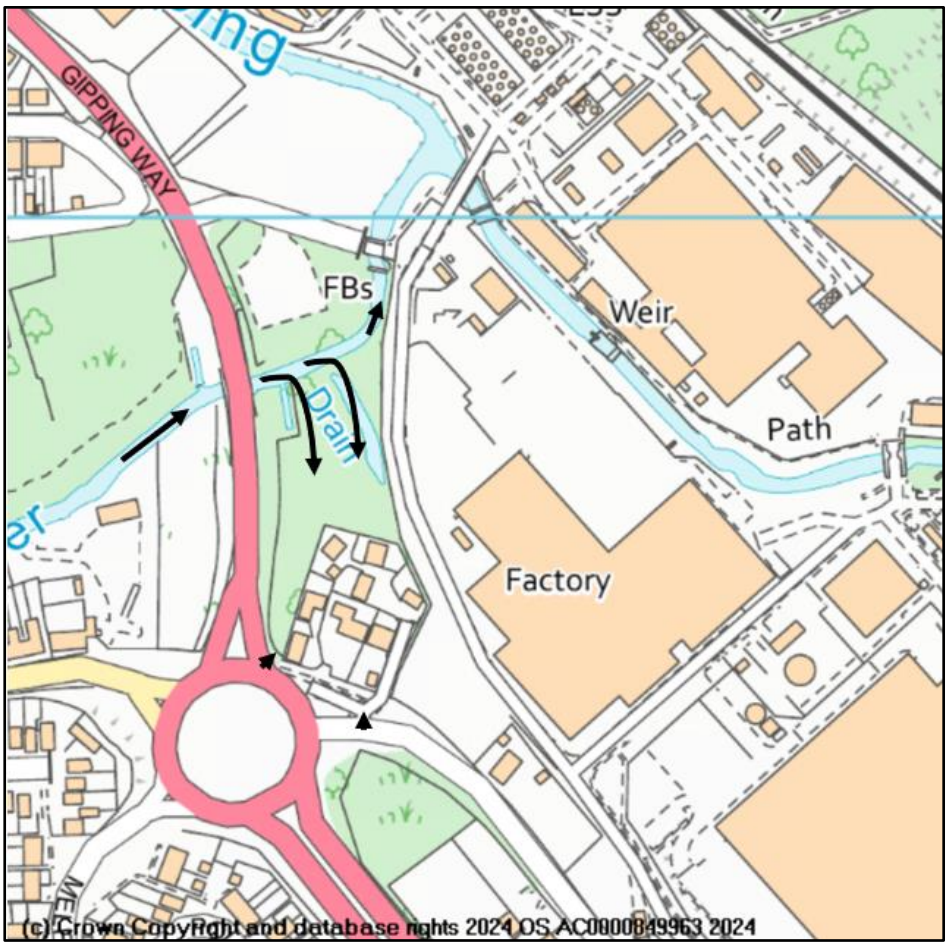

Figure 19 Needham Road approximate flowpaths for residential property

Affected residential property on the Rattlesden River floodplain, situated between the Gipping Way and Needham Road roundabout and commercial property to the east of the roundabout, is projected to be at high fluvial and pluvial flood risk, with water flow coming from rivers and overland run off. Impacted residential property in this location was reported to be flooded from the Rattlesden River overtopping and flowing south. This would have been compounded by surface water flowing north over roads from the south side of affected property. Internal flooding was reported to a depth of 20cm. This location also reported that rubbish and trees were obstructing the River Gipping.

In summary:

- Intense and prolonged rainfall exceeded the capacity of the Rattlesden River, causing it to overtop its banks and flood adjacent domestic property to the south on Needham Road.
- Surface water flowing north from roads on the south side added to floodwater.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.

- Residents to report obstructions in the Rattlesden River to the Environment Agency.
- Relevant authority to inform landowners of riparian responsibilities.
- Explore the potential for NFM measures which aim to attenuate surface water in the upper catchment of the Rattlesden River.

7. Combs Ford

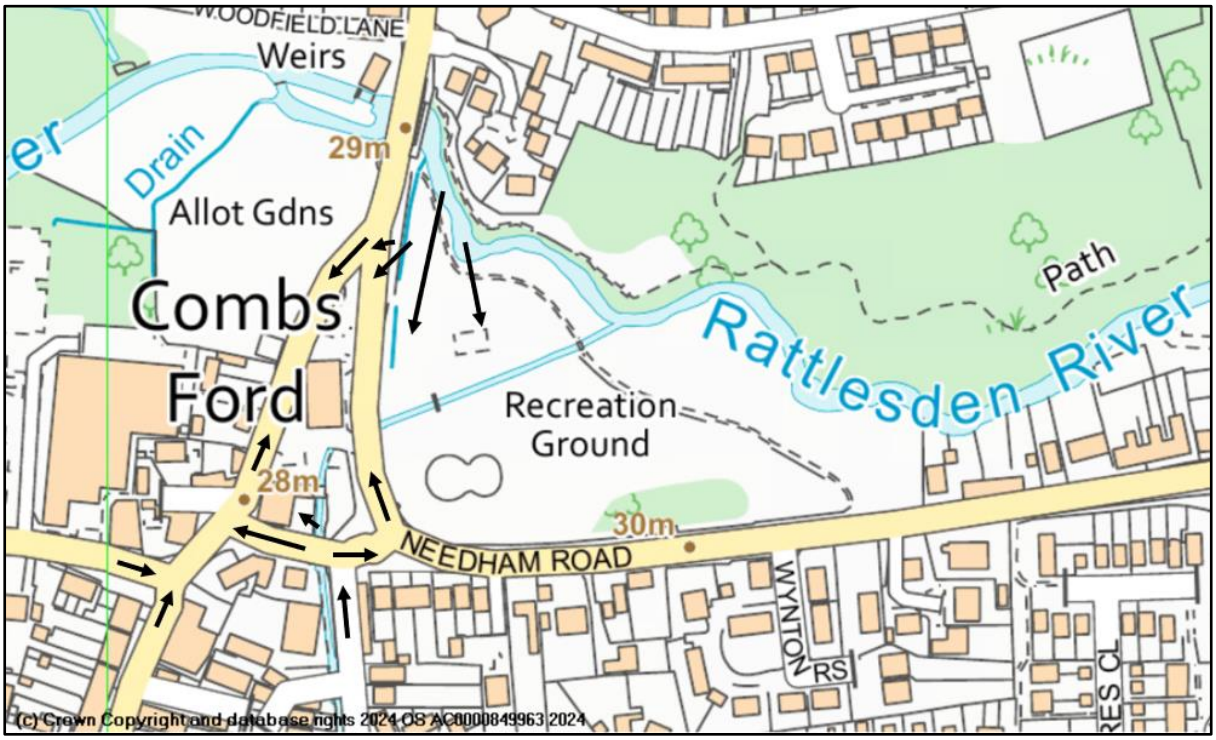

Figure 20 Combs Ford approximate floodwater flowpaths

Combs Ford is an area projected to be at high risk of pluvial and fluvial flooding, with fluvial flood risk arising from both Combs Beck and Rattlesden River. Combs Beck flows north through Combs Ford and turns east across Pikes Meadow to join the Rattlesden River.

On the 20th October, Rattlesden River overtopped its banks, flowing south and flooding several commercial properties on Poplar Hill and Needham Road in Combs Ford. Combs Beck also overtopped in Combs Ford contributing to flooding of surrounding property. Surface water flowed down Combs Lane, Poplar Hill and Lavenham Way towards Combs Ford collecting at low points on the Poplar Hill, Ipswich Road and Needham Road triangle.

In summary:

- Intense and prolonged rainfall caused Rattlesden River to overtop, flowing south and flooding several commercial properties on Poplar Hill and Needham Road in Combs Ford.

- Combs Beck also overtopped in Combs Ford contributing to flooding of surrounding property.
- Surface water flowed down towards Combs Ford from Combs Lane, Poplar Hill and Lavenham Way, collecting at lower points on the Poplar Hill, Ipswich Road and Needham Road triangle.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Residents to report obstructions in Combs Beck and the Rattlesden River to the Environment Agency.
- Explore the potential for NFM measures which aim to attenuate floodwater in the upper catchment of the Rattlesden River.
- Explore the potential for NFM measures which aim to attenuate floodwater in the upper catchment of Combs Beck.

8. Bramford Court

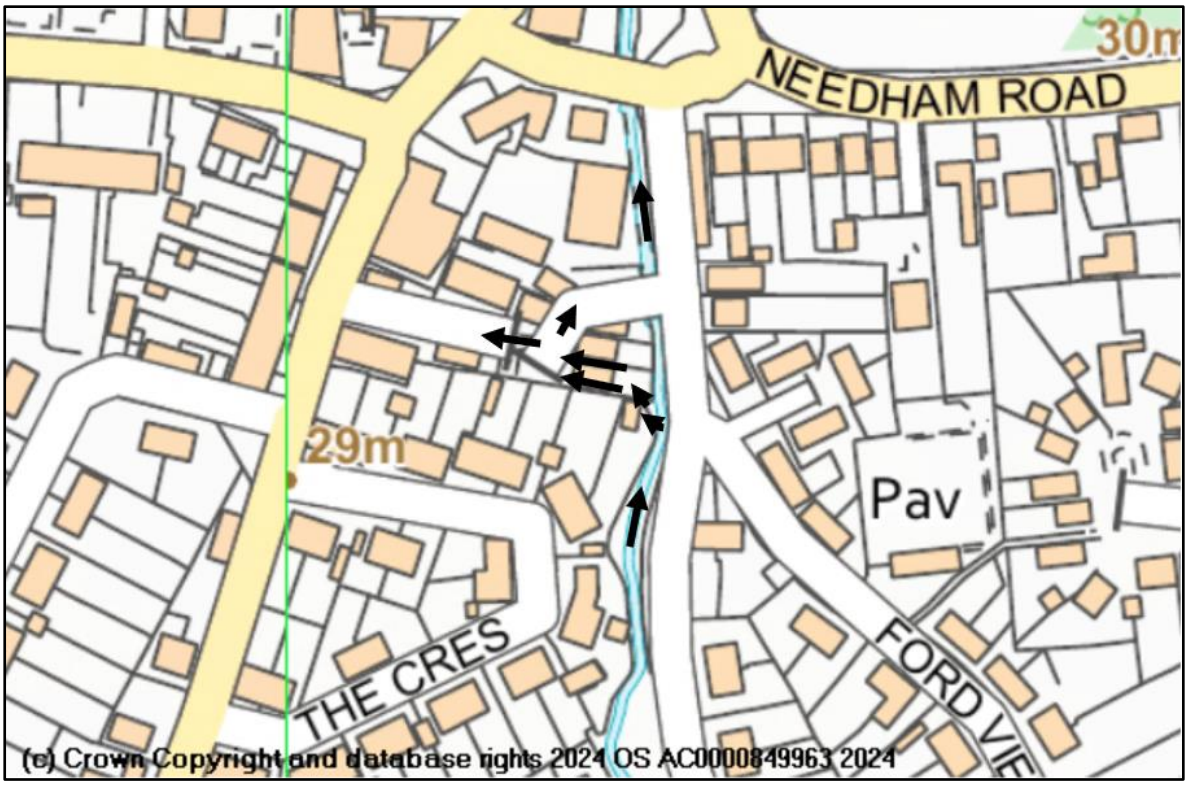

Figure 21 Bramford Court approximate floodwater flowpaths

Bramford Court is projected to be at high fluvial and pluvial flood risk with water flow coming from rivers and overland run off. Affected properties were flooded from Combs Beck overtopping its banks. Floodwater flowed across a section of low-lying bank through an adjacent garden area to the south of Bramford Court, entering Bramford

Court through the fence. It then continued to flow between property and flood further property in Bramford Court. Water levels in Combs Beck were reported as rising on the morning of the 20th October and reaching the level of the bridge into Bramford Court by midday. Flooding was also reported from highway surface water. However, drains in Bramford Court were reported by residents to be clear and were presumably overwhelmed by the extreme conditions.

In summary:

- Intense and prolonged rainfall caused Combs Beck to overtop and floodwater to surround and enter property.,
- Surface water on the road in Bramford Court contributed to flooding.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Residents to report obstructions in the watercourse to the Environment Agency.
- Environment Agency and/or riparian landowner to investigate whether raising the level of the low-lying bank on the west side of Comb's Beck, to the south of Bramford Court could reduce the flood risk to property without adversely impacting flood risk elsewhere.
- Explore the potential for NFM measures which aim to attenuate floodwater in the upper catchment of Combs Beck.

9. Lindsey Way

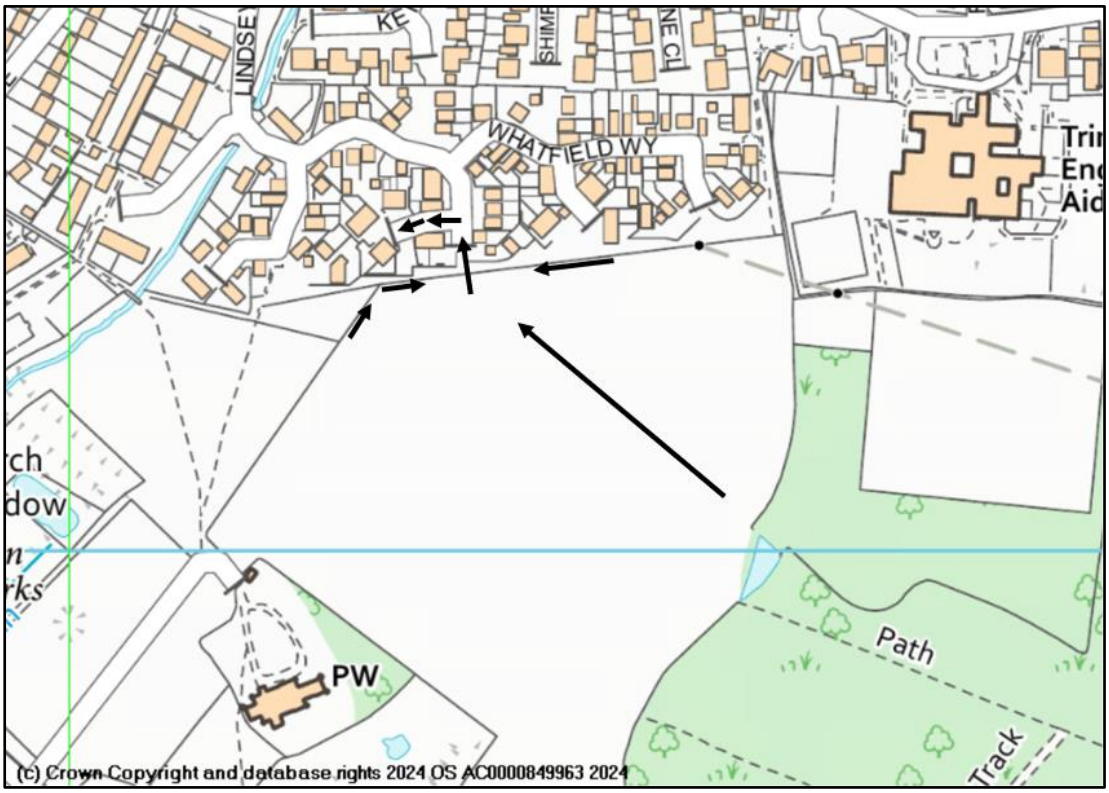

Figure 22 Lindsey Way approximate floodwater flowpaths

Affected property in the southeastern part of Lindsey Way is predicted to be at low pluvial flood risk and no fluvial flood risk. Property in this section of Lindsey Way was affected by surface water flooding from fields to the south which slope down northwest from Combs Wood towards Lindsey Way. Some of this floodwater overtopped a small ditch (which has partly filled with soil) at the bottom of the field and flowed between houses on to the highway. Highway drains were reported as being overwhelmed. Directly behind property in this section of Lindsey Way is a brick headwall with a piped opening across the section of the ditch which transports water from the west side of the field. This has a trash screen and is presumably intended to convey water from the ditch to the surface water drainage system in Lindsey Way. However, this section of ditch also overtopped, flooding property in Lindsey Way from the rear. Flooding of property in this section of Lindsey Way recurred during Storm Ciaran**.**

In summary:

- Intense and prolonged rainfall caused surface water to flow northwest from Combs Wood down a field slope towards the southeastern section of Lindsey Way.
- Some of this floodwater overtopped a small ditch across its path and entered Lindsey Way directly.
- Highways drains in Lindsey Way were reported as being overwhelmed.

- A pipe entranceway and section of ditch was overwhelmed, flooding property facing Lindsey Way from the rear.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Landowners to undertake targeted maintenance (clearing of soil and debris) to the east and west of brick headwall as per riparian responsibilities.
- Landowner(s) to investigate the function and condition of pipe transporting floodwater from ditch at rear of properties in Lindsey Way.
- Suffolk County Council Highways to ensure completion of cyclic maintenance of highway gullies on Lindsey Way.
- Investigate the potential for increasing the storage capacity of the ditch.
- Investigate the potential for additional natural flood management measures (for example bunds and buffer strips) in fields to the rear of affected property.

10. Danescourt Avenue

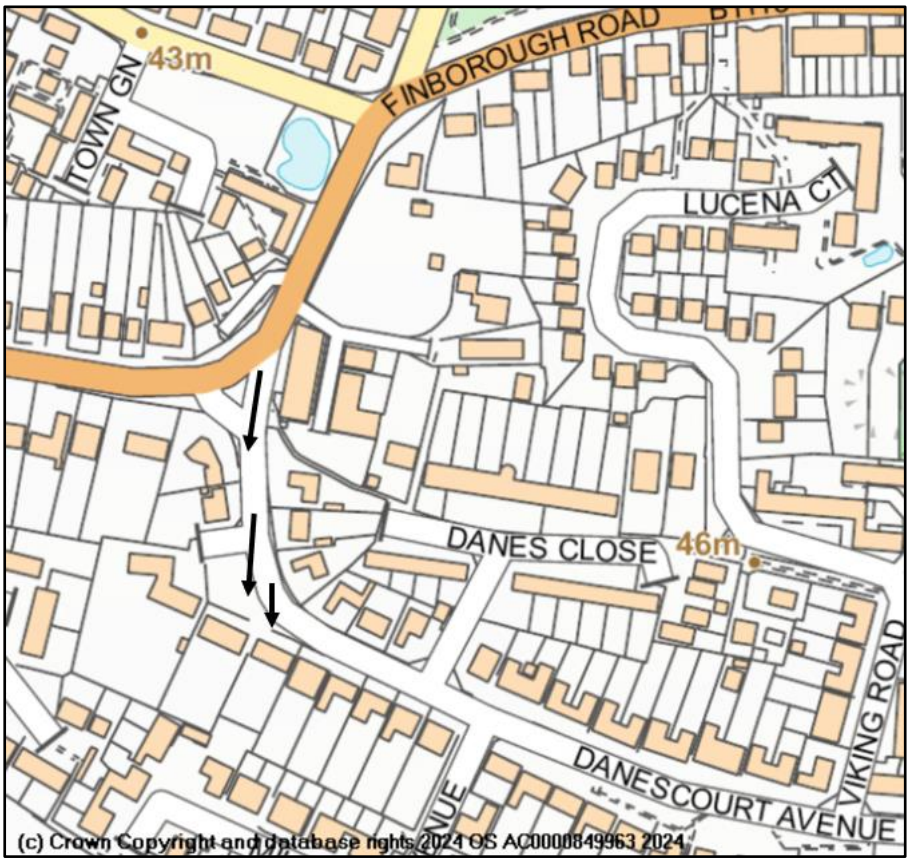

Figure 23 Danescourt Avenue approximate floodwater flowpaths

Affected property is not predicted to be at risk of flooding from fluvial or pluvial sources. However, during the event, surface water was experienced to be flowing south down

the western section of Danescourt Avenue, overwhelming highway drainage and flooding property at a lower level than the road.

In summary:

- Surface water flowed south down the western section of Danescourt Avenue.
- Highway drainage was overwhelmed and surcharging observed from manhole.
- Properties impacted were situated lower than the highway, causing water to be directed to property.

Recommendations:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Suffolk County Council Highways to ensure completion of cyclic maintenance of highway gullies on Danescourt Avenue.

A1120 between Gun Cotton Way and A14

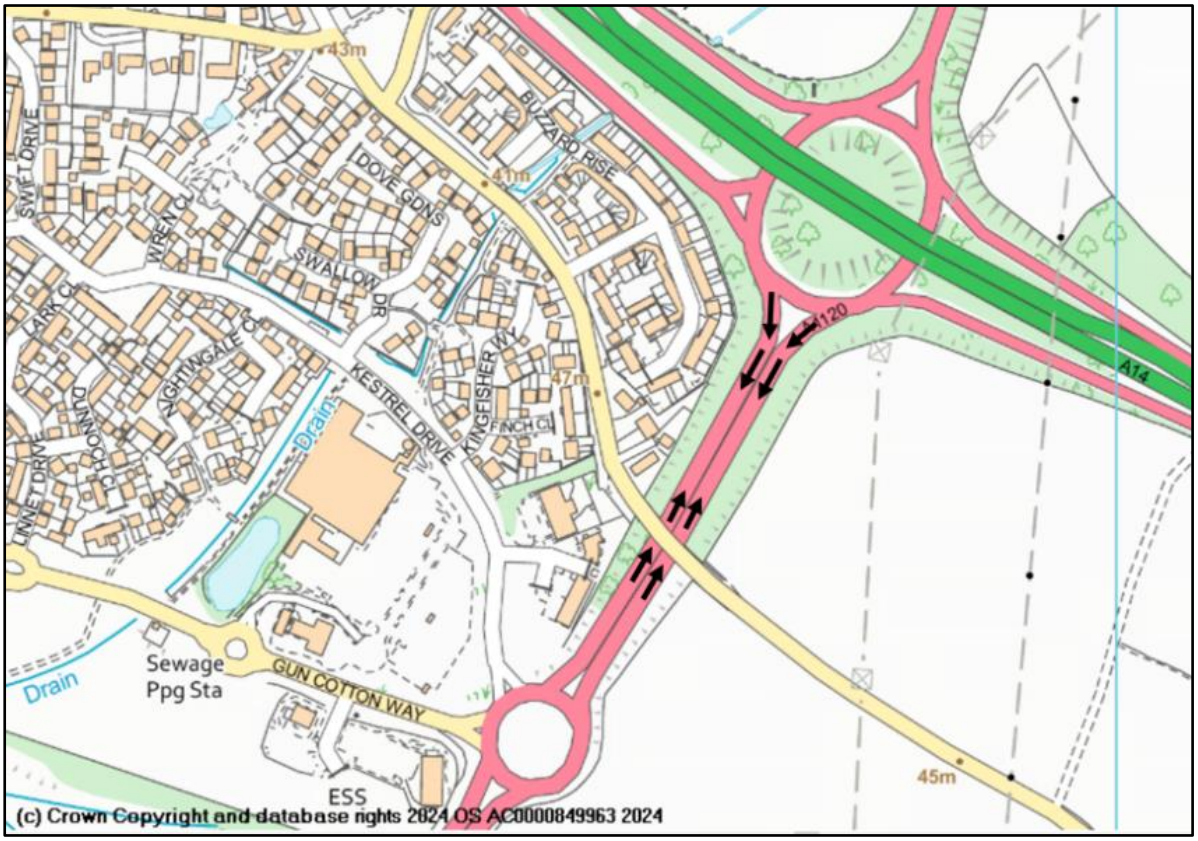

Figure 24 A1120 approximate floodwater flowpaths

Surface water flowed down highway gradients to collect on a section of the A1120, adjacent to the A14 junction roundabout. This resulted in the closure of Lane 1 of the northeast bound carriageway. Subsequently, extensive work has been undertaken to

clear and jet highway drainage assets. Further repair work to drainage in this area is being planned to complete this work through to outfalls.

Risk Management Authorities, Non-Risk Management Authorities and flood risk functions

The following section acknowledges both RMA's and Non-RMA's relevant to the location and provide an overview of their flood risk functions. The table has been compiled from information collated as part of the investigation. It is not exhaustive and it should be acknowledged additional organisations and groups may be active within the community.

Risk Management Authority	**Relevant Flood Risk Function(s)**
Suffolk County Council	Lead Local Flood Authority, Highways Authority & Asset Owner
Environment Agency	Lead organisation for providing flood risk management under its permissive powers and warning of flooding from main rivers
Anglian Water	Asset Owner
East Suffolk Internal Drainage Board	Asset Owner
Babergh & Mid Suffolk District Council	Local Planning Authority & Asset Owner
Non-Risk Management Authority	**Relevant Flood Risk Function(s)**
Private Landowners	Riparian responsibilities for watercourses
Private residential and commercial landowners	Riparian Responsibilities and improving flood resilience to property
Stowmarket Town Council	Manage flood risk at a community level, prepare and produce flood action plans and maintain watercourses where present on land they own.

Action(s) completed prior to publication:

The following section acknowledges actions that RMA's and Non-RMAs have implemented or are currently in progress since Storm Babet and prior to publishing of this report.

Action	Responsible Party	Progress
Offer of £5k Property Flood Resilience (PFR) grant funded scheme to eligible properties that flooded during Storms Babet	Suffolk County Council Lead Local Flood Authority (LLFA)	Ongoing
Routine annual channel maintenance undertaken Autumn/Winter 24/25 on	The Environment Agency	Ongoing

the Rattlesden River, at Edgars Farm and on Combs Beck		
Planned improvement works to the telemetry equipment which controls the operation of the outlet control sluice at Gipping flood storage reservoir	The Environment Agency	Completed
Ensure riparian landowner responsibilities are understood with regard to watercourse management in Stowmarket	The Environment Agency	EA issued riparian guidance in autumn 2024 to riparian landowners of main river sections where there are no known access issues.
Ensure riparian landowner responsibilities are understood with regard to watercourse management in Stowmarket	SCC LLFA	SCC published "Flood Smart Living" online and hard copy guide to increasing flood resilience for residents, landowners and communities, December 2024
Validation of the Flood Alert Area of the Rivers Rattlesden and Gipping and Flood Warning Area of Stowmarket. Reviewing information content in flood messages issued for Stowmarket, together with a review of warning area spatial extents and flood warning thresholds.	The Environment Agency	The review confirmed that no significant changes were required for the area of Stowmarket.
Clear/repair drainage assets to outfalls on A1120 by A14 junction	Suffolk County Council Highways Authority	Jetting and CCTV video survey completed August 2024.

LLFA Recommended Action(s):

The following section provides a range of flood mitigation measures that could be implemented to reduce the risk of flooding in Stowmarket. They have been derived from data and evidence collated as part of the report and have been included having been considered realistic in their implementation. The implementation of actions falls to the responsible party. Progress on the action will be monitored by Suffolk County Council but it should be acknowledged that the council has limited powers to enforce the implementation of recommended actions.

Action	Responsible Party	Timescale for response	Latest Progress Update for Actions (June 2025)
Short Term Actions (e.g. standard maintenance activity and initial investigation of options that can be undertaken with limited need for forward planning)			
Establish a Community Emergency Plan that includes plans to manage future flood events –Liaison with Suffolk Joint Emergency Planning Unit	Stowmarket Town Council	6 months	**Complete**
Maximise the uptake of the £5k PFR Grant currently available to residents before the April 2025 deadline	SCC LLFA / Residents	6 months	**Complete** DEFRA PFR Grant has now closed for new applications. Installation of PFR measures on approved applications has been extended to December 2025. Further information on PFR measures can be found within SCC published “Flood Smart Living” handbook. There is currently no active PFR schemes being managed by the LLFA in Suffolk.
Ensure the completion of highway drainage asset cyclic maintenance and ensure any	SCC Highways Authority		**Ongoing** - Cyclic cleansing of gullies in Stowmarket was carried out in July 2024

observed blockages are cleared- key areas include Purcell Road, Lindsey Way and Danescourt Avenue.		Annually	**Purcell Road** The network was cleared in May 2025 and was fully operational, silt levels were recorded at a maximum of 75%. Short-term actions completed. **Lindsey Way** Currently, there is one non-operational gully, and three others require clearance, having been obstructed by vehicles during the last visit. Works on the non-operational and obstructed gully are planned and are due for delivery, with a cyclical routine cleansing the network programmed for July 2025. **Danescourt Avenue** Three gullies could not be jetted during the last visit due to obstructions. To resolve this, a Temporary Traffic Regulation Order (TTRO) for parking is being arranged to enable full network jetting. The next round of cyclical works is planned for July 2025.
Report any observed blockages below the road bridges over the watercourses to the relevant authority to be investigated and removed if appropriate.	Residents, SCC Highways Authority	N/A	Residents to report via the Highways Reporting Tool - https://www.suffolk.gov.uk/roads-and-transport/highway-maintenance/report-a-highways-issue
Complete clearing/repair of drainage assets to outfalls on A1120 by A14 junction	SCC Highways Authority	6 months – 12 months	**Ongoing** - The scheme is currently undergoing detailed design by our professional services team. Although the network was cleared in 2024, additional investigations are still necessary to complete the design phase. The upcoming stage will focus on further underground investigations into the outfall to identify and specify the full requirements for repairs.

Report any obstructions in Cardinalls Drain, the River Gipping, Rattlesden River or Combs Beck channels to the relevant authority	Residents, Environment Agency	N/A	**Complete** EA - A search of NIRS shows two blockages reported, both hedge trimmings, one was removed by EA field team other assessed as minimal flood risk. EA engaged contractors to remove blockages caused by trees downstream of the Gipping Flood Storage Reservoir.
Clear ditch of accumulated soil and debris at rear of affected properties in Lindsey Way	Riparian Owners	6 months	No further update
Landowner(s) to investigate the function and condition of pipe transporting floodwater from ditch at rear of properties in Lindsey Way.	Riparian Owners	6-12 months	No further update
Installation of Property Flood Resilience (PFR) to frequently flooded properties from main river sources.	Environment Agency	6-12 months	**Ongoing** EA - Installation of PFR measures to property in Regent Street progressing, to be completed by July 2025. PFR survey carried out on property off Station Road East, with PFR measures to be installed in 2026.
Medium Term Actions (e.g. longer planning timescales and potential need to source funding but potential for greater impact)			

Explore potential NFM measures to 'slow the flow' and attenuate water in the upper catchment of the River Gipping, eg. leaky dams and attenuation ponds (see Appendix A)	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	No updated expected at this time.
Explore potential NFM measures to 'slow the flow' and attenuate water in the upper catchment of the Rattlesden River, eg. leaky dams and attenuation ponds (see Appendix A)	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	No updated expected at this time.
Explore potential NFM measures to 'slow the flow' and attenuate water in the upper catchment of Combs Beck, eg. leaky dams and attenuation ponds (see Appendix A)	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	No updated expected at this time.
Explore potential for natural flood management measures in field to the south of Lindsey Way, eg. increasing ditch storage capacity, bunds and buffer strips (see Appendix A)	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	No updated expected at this time.
Through hydraulic modelling the Environment Agency and/or riparian landowner to investigate whether raising the level of the low-lying bank on	Environment Agency to progress hydraulic modelling	24 months	**Ongoing** EA - Scope for modelling work being developed during 2025.

the west side of Comb's Beck, to the south of Bramford Court could reduce the risk of property flooding without adversely increasing flood risk elsewhere. (see Appendix A)			
Long Term actions (significantly longer timescale and budget required with potentially greater positive impact)			
Installation of NFM features within upper catchments to attenuate and slow floodwater if investigation works suggest it is viable. (see Appendix A)	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	No updated expected at this time.
Environment Agency to investigate whether there are any technically feasible, economically viable, affordable and environmentally acceptable ways to improve flood risk management for the town from main river sources.	Environment Agency	TBC	No updated expected at this time.

Approval

This report will be reviewed and updated every 6 months until actions are marked as complete.

Reviewer	Date of Review
Ellie Coleby	04/07/2025

Disclaimer

This report has been prepared and published as part of Suffolk County Council's responsibilities under Section 19 of 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 while all reasonable efforts have been made to gather and verify such information 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. Should there be additional information available to develop the report, please email to floodinvestigations@suffolk.gov.uk.

The opinions, conclusions and recommendations in this Report are based on assumptions made by Suffolk 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.

Suffolk 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 Suffolk 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 Suffolk County Council highlighting flooding to properties at a street level. Property owners and prospective purchasers or occupiers of property are advised to seek and rely on their own surveys and reports regarding any specific risk to any identified area of land.

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APPENDIX A - Indicative locations for NFM and watercourse maintenance