Section 19 Flood and Water Management Act 2010

Witnesham & Swilland 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. Witnesham and Swilland were two nearby villages that were significantly impacted, with approximately 16 properties suffering internal flooding. 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.

Witnesham and Swilland are located in areas at 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. Parts of Witnesham are low-lying, surrounded by a reasonably steep rural catchment. Multiple floodwater flow paths converge near the village centre. The local geology and soils are characterised as having low permeability and high run off, making a number of properties in Witnesham and Swilland 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 Witnesham and Swilland were widespread and for the purposes of this report, the affected areas have been categorised into five locations. 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) and the community.

A comprehensive summary for each location is provided within the report, outlining the context of the event and the impact. Key findings are that Witnesham and Swilland were severely impacted by flooding due to the intensity of rainfall, that overwhelmed the natural flow routes and the capacity of watercourses and drainage infrastructure. This situation was compounded when multiple overland flow paths converged and exceeded the capacity of a private piped watercourse, resulting in 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 the villages. For short term measures, key highlights include the implementation of community flood plans, maximising Property Flood Resilience (PFR) grants, maintenance of watercourses and local Community Self Help schemes. For medium to longer term recommendations, there is emphasis on the investigation of potential improvements to drainage infrastructure, management of water from rural land and the creation of new natural flood management features, 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 Met Office weather data (Met Office, 1991-2020). This significant rainfall occurred in a short space of time and 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 measuring 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 flood water downstream. A major incident was declared by the 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.

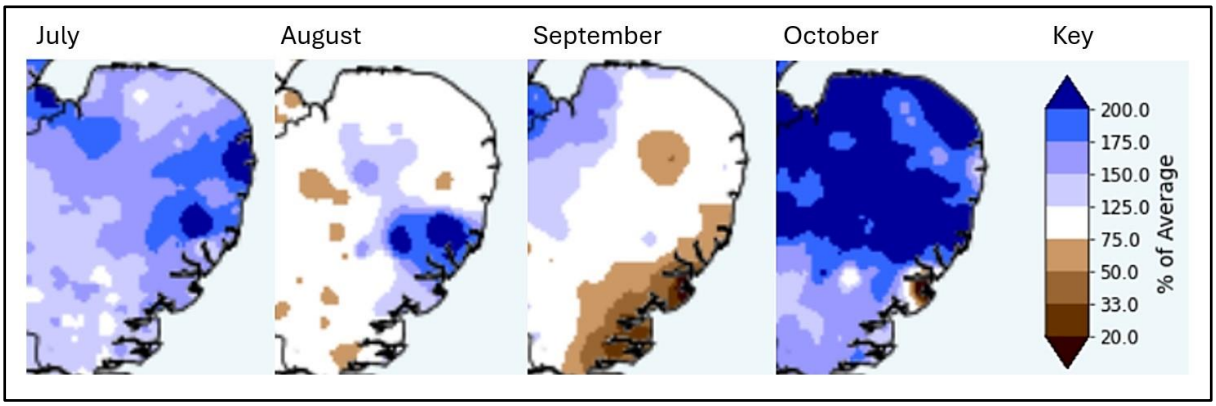

Figure 1. Average rainfall in East Anglia between July and October 2023 as a percentage of the historical average monthly rainfall

The following report acknowledges that October 2023, and in particular Storm Babet, was an extreme event and will assess the likely 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

Witnesham is a small village situated approximately 4 miles north of Ipswich. Swilland lies just to the north of Witnesham. Swilland and Witnesham share a parish council called Swilland and Witnesham Grouped Parish Council. Both are located in the district of East Suffolk.

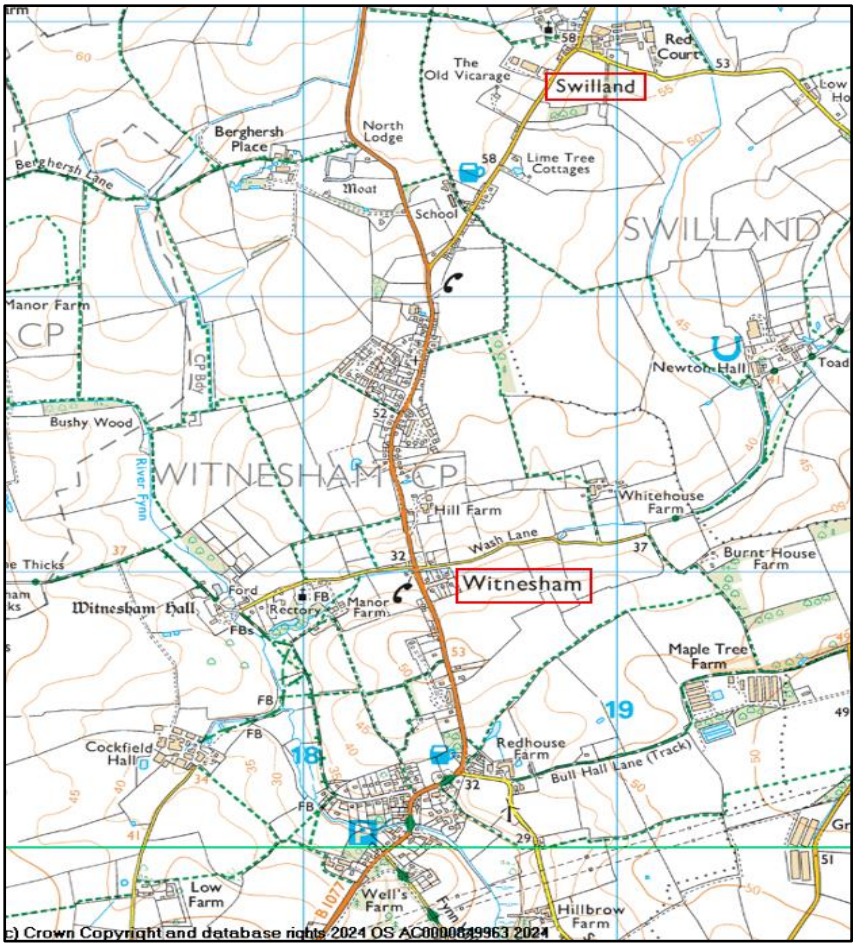

Figure 2. Investigation area map

On the 20th of October 2023, Storm Babet resulted in significant rainfall in Suffolk on top of an already wetter than average October. This caused internal flooding to properties, residential and commercial, across the county from various flooding sources. The following report is focused on Witnesham and Swilland and will discuss the possible sources of the event, the observed flow paths through the communities, and the receptors which have been affected.

Witnesham and Swilland were significantly impacted with approximately 16 properties reporting internal flooding. Flood water was described as coming from several sources including surface water runoff from surrounding fields and highways (pluvial), the overtopping of local watercourses (fluvial) and overwhelmed sewerage and drainage systems. Within this report, the term 'flood water' may be used to describe all types of flooding.

Figure. 3 shows the most significant watercourses in the area surrounding Witnesham and Swilland, including the River Fynn through Witnesham, a statutory main river.

The Environment Agency has permissive powers to carry out maintenance, improvement or construction work on main rivers to manage flood risk. The Internal Drainage Boards (IDBs) have similar permissive powers but instead relate to ordinary watercourses within their board area.

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.

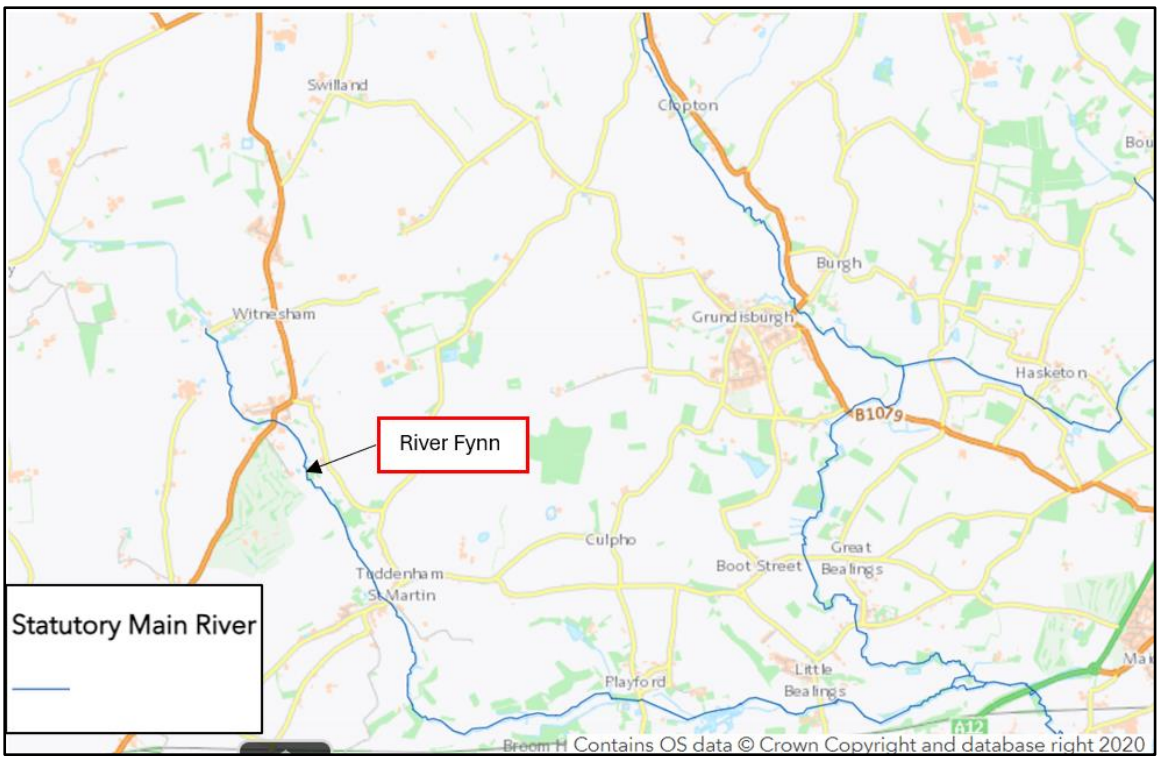

Figure 3. Location of statutory main rivers and significant ordinary watercourses

For the purposes of this investigation the various areas affected by flooding have been separated into five distinct locations (see Figures 4, 5 & 6). The locations are as follows:

1. The Street
2. Tuddenham Lane
3. Mow Hill
4. Upper Street and Weyland Road
5. Swilland

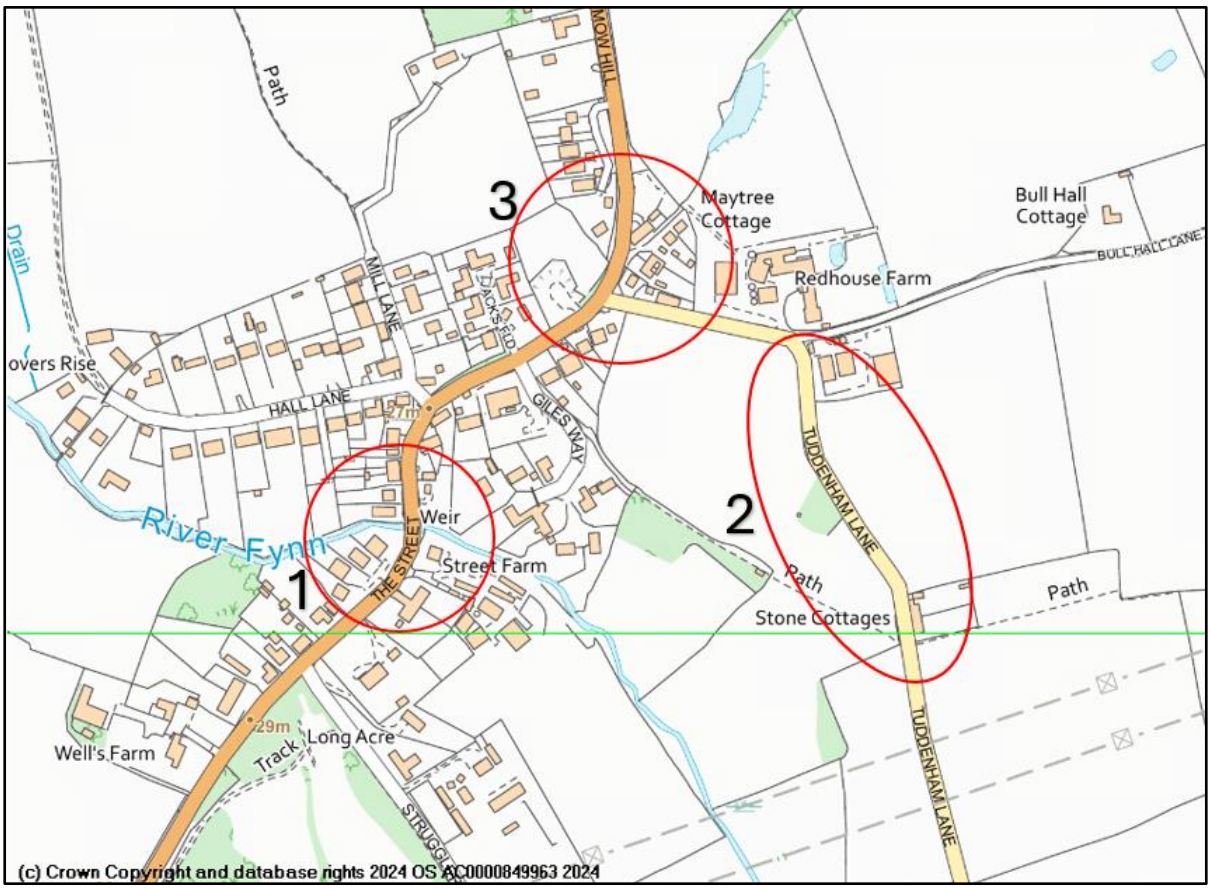

Figure 4. Witnesham investigation area map with locations (1)

Figure 5. Witnesham investigation area map with location (2)

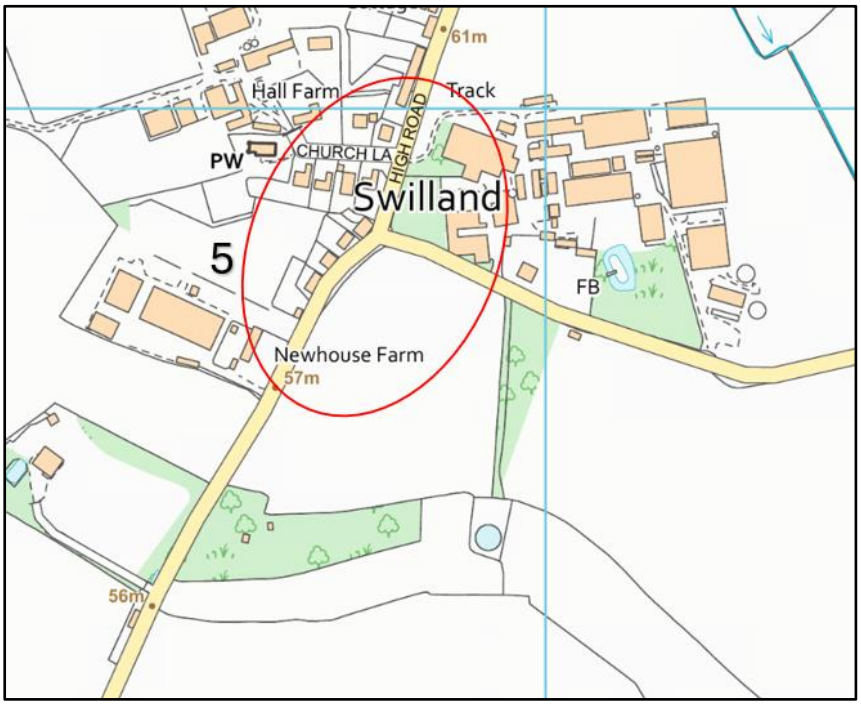

Figure 6. Swilland investigation area map

3. Records of any historical flooding

A review of Suffolk County Council's highway reporting tool, Anglian Water and Environment Agency records, indicate that Witnesham and Swilland have been impacted by flooding to varying extents in the recent past.

Between November 2014 and October 2023 there were 117 reports concerning Highways drainage or flooding in Swilland and Witnesham. Since Storm Babet there were 85 customer reports to SCC about drains/floods between 19/10/23 to 23/01/2025.

Anglian Water records show three previous reports in the area of Weyland Road. Two of these were blockages which affected properties. The third event was an impact from Storm Babet.

The EA hold no historical flood history data for Witnesham and Swilland.

4. Predicted Flood Risk

Several areas of Witnesham and Swilland show significant flood risk from pluvial and fluvial sources.

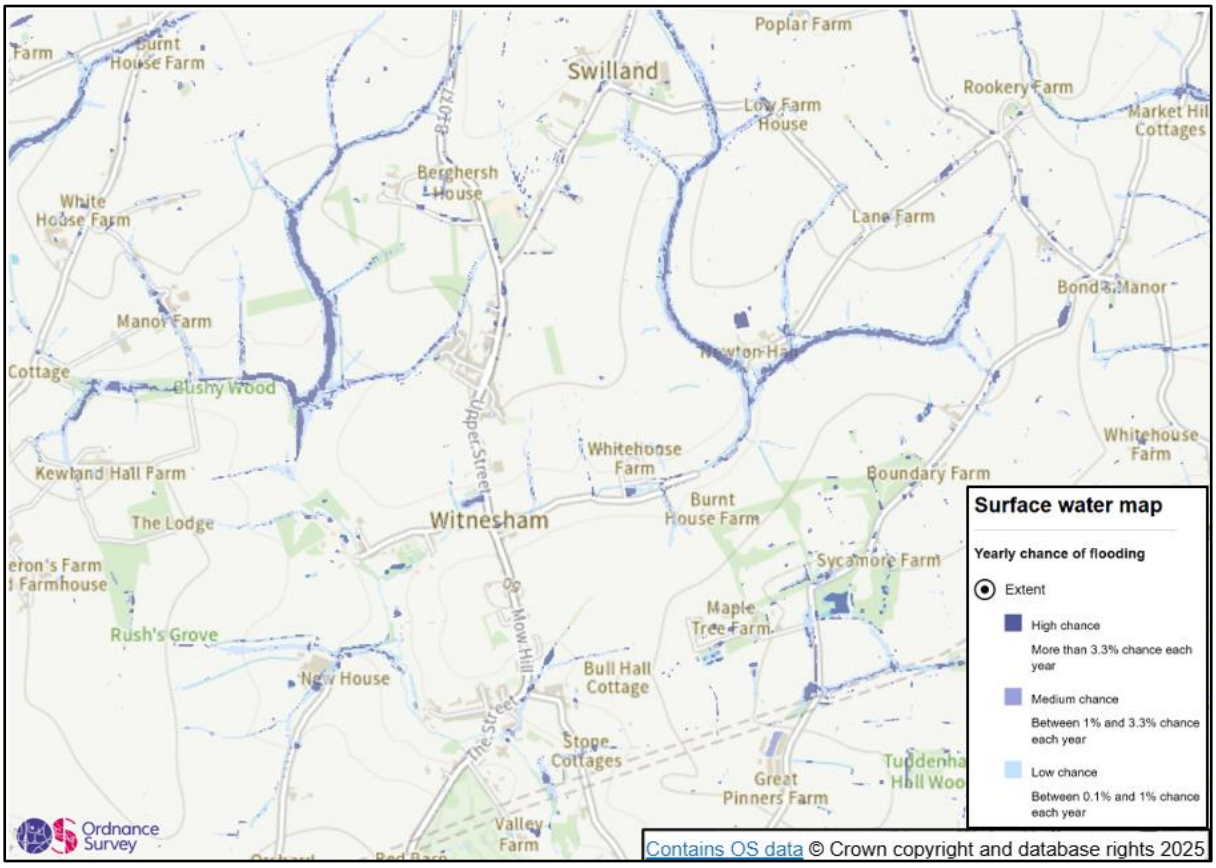

Figure 7. Surface water flood risk

Figure 7 highlights the pluvial (surface water run-off from surrounding land and highways) flood risk in Witnesham and Swilland, with multiple major flow paths coming into Witnesham from the northeast, northwest and west. Surface water flow paths come into Swilland predominately from fields to the west and north.

There is a high chance of surface water flooding on parts of The Street, Mow Hill and Tuddenham Lane. Upper Street, Weyland Road and Swilland are shown to be at a low chance of surface water flooding. All of these areas were affected by flooding during Storm Babet.

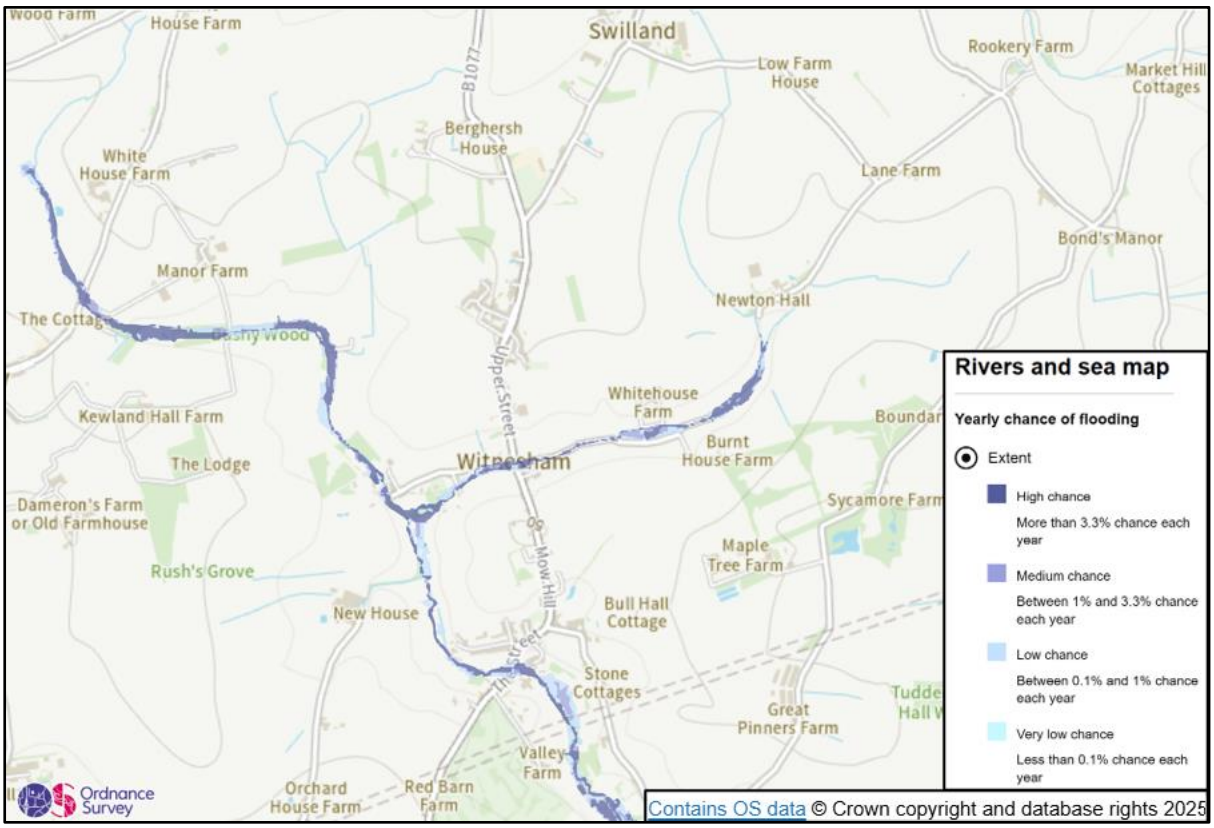

Figure 8. Flood risk from rivers and sea

Figure 8 shows the fluvial (from designated main river and ordinary watercourses) flood risk in Witnesham and Swilland. Fluvial flood risk in Witnesham is predominantly associated with the river Fynn which passes through the village. Swilland is shown not to have any fluvial flood risk.

In Witnesham, parts of The Street are predicted to be at medium to high chance of fluvial flooding. The area around the road bridge on The Street was significantly affected by flooding during Storm Babet.

5. Catchment characteristics

The villages of Witnesham and Swilland are situated in a rural area dominated by arable agriculture. Witnesham straddles the river Fynn which flows approximately northwest to southeast through the village. Swilland is located on higher ground to the north of the river.

The low-lying nature of parts of Witnesham mean that during high rainfall events, considerable overland flows converge towards the village and ultimately into the river Fynn. Overwhelmed drainage infrastructure and watercourses may be observed during these intense rainfall events.

Figure 9 shows the topography surrounding Witnesham and Swilland with gradient changes across both. Large parts of Witnesham are situated lower than the surrounding land. The lowest point in Witnesham is along The Street at the crossing of the river Fynn. Mow Hill and Tuddenham Lane are lower than the surrounding land to the east and north. These locations were identified as being some of the worst affected areas during Storm Babet. Swilland is on relatively higher but generally more flat ground to the north.

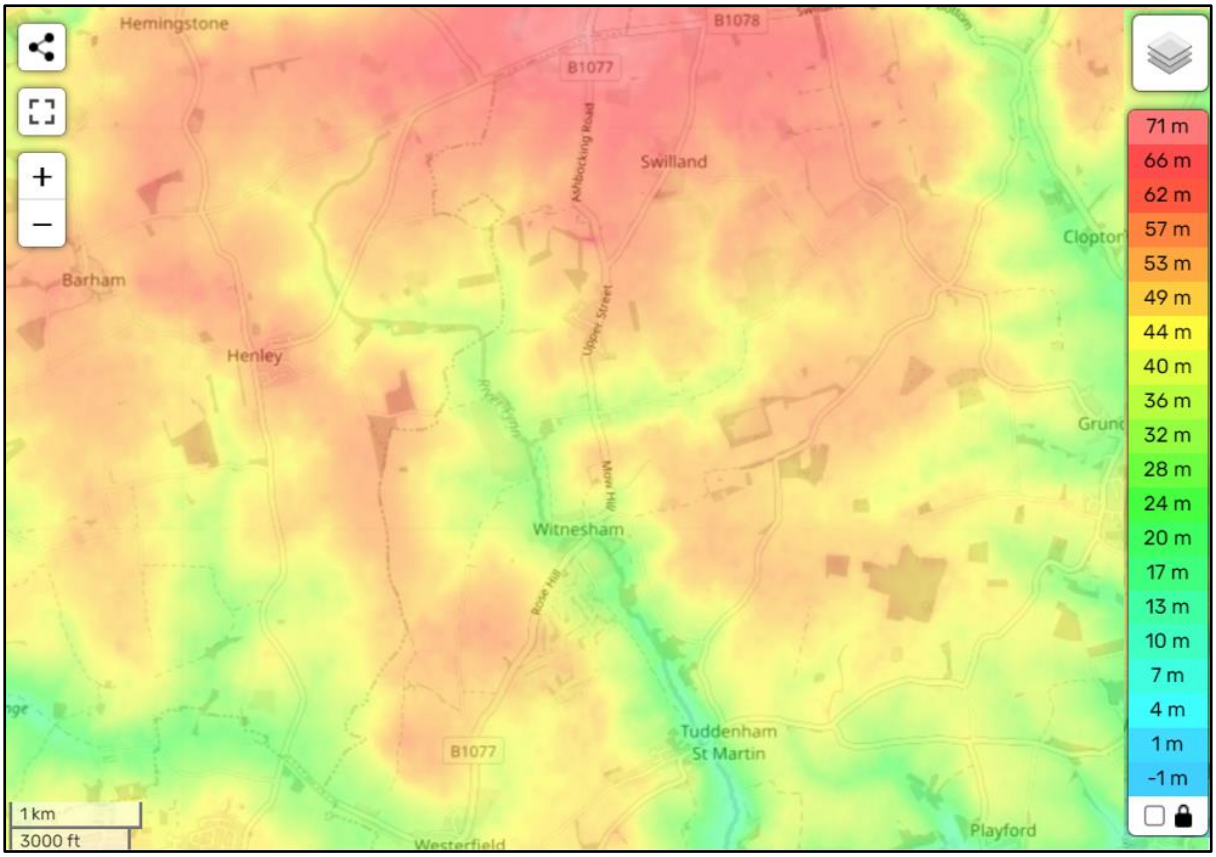

Figure 9. Witnesham and Swilland surrounding topography (TessaDEM as cited in topographic-map.com)

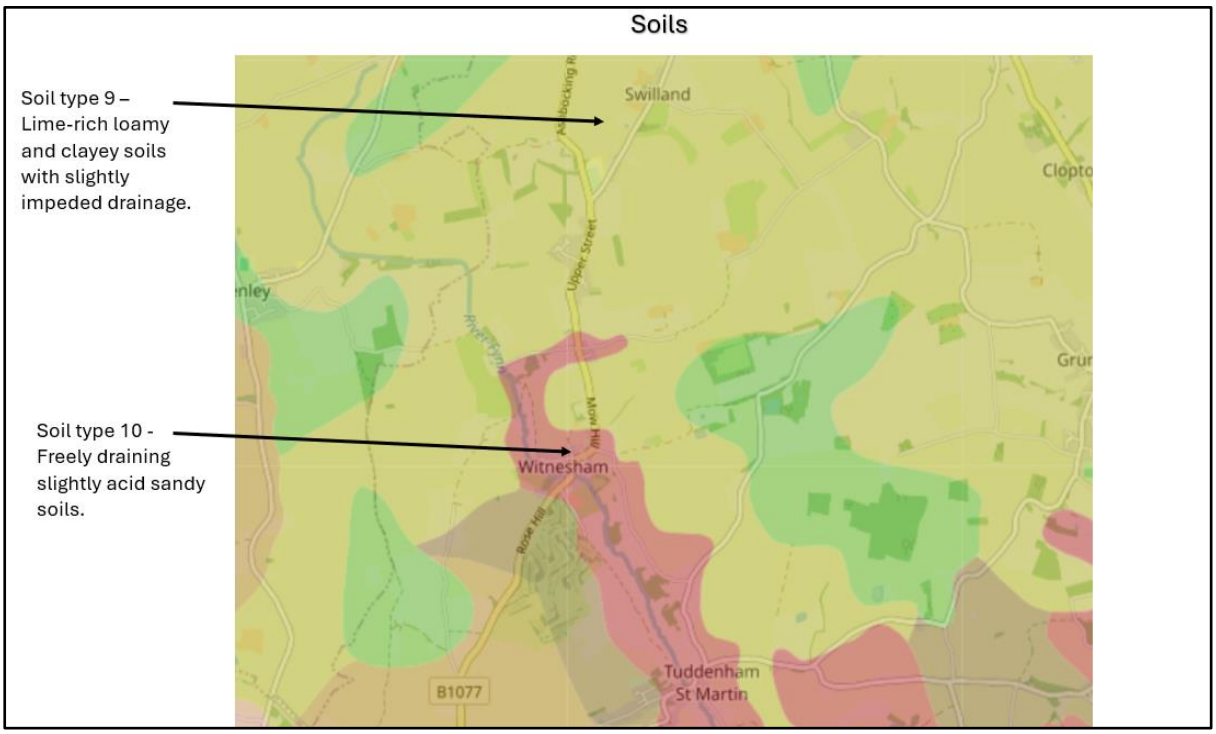

Figure 10. Soil map (LandIS Soilscapes)

The soils more generally surrounding Witnesham and Swilland are loamy and clayey with impeded or slightly impeded drainage, meaning that water permeates more slowly and surface water runoff is greater. Parts of Witnesham are situated on alluvium, mostly sand and gravels with a mixture of clay and silts. The floodplain soils surrounding the river Fynn are more freely draining, usually have naturally high groundwater and tend to be wetter.

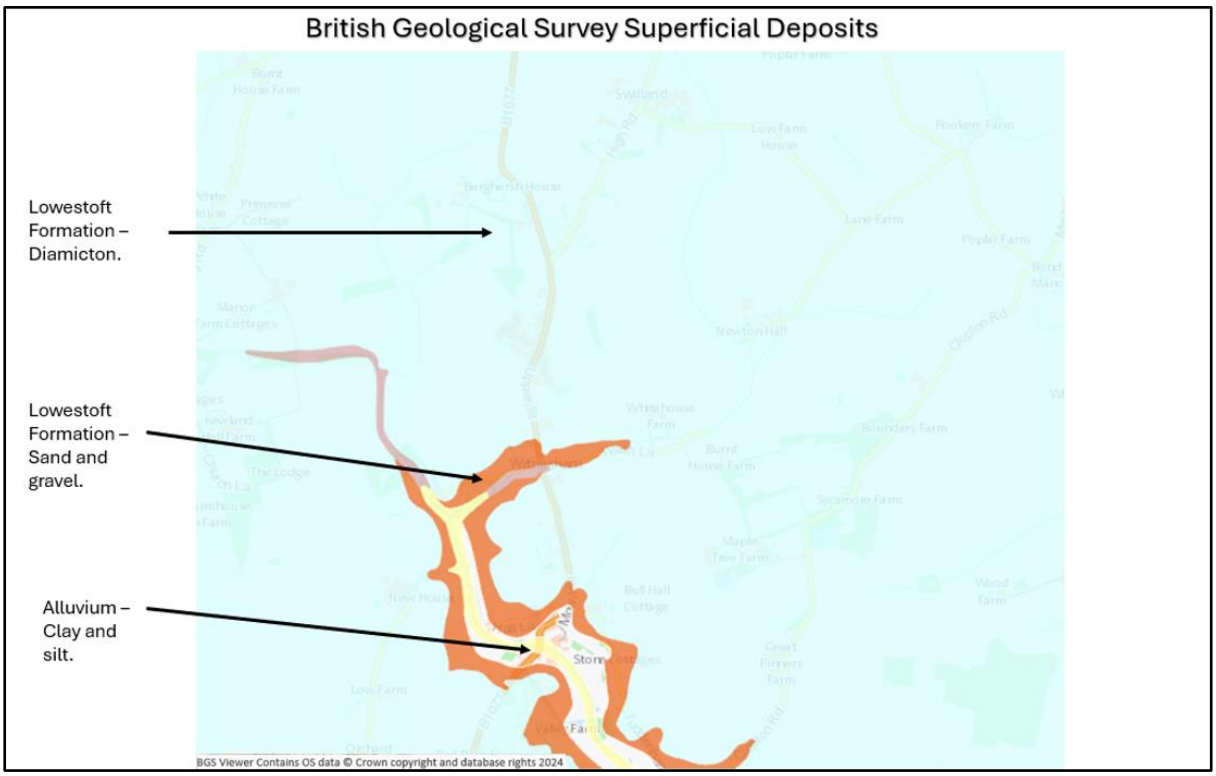

Figure 11. Superficial Geology (BGS Viewer)

Lowestoft Formation 'Diamicton' surrounds the villages of Witnesham and Swilland 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 generally has a low permeability meaning water will tend to flow off it before it can be infiltrated, which reflects some of the reports from the Storm Babet event.

The low-lying nature of areas of Witnesham, with several major surface water flow paths and the low permeability of the surrounding soils, make them susceptible to flooding events in extreme rainfall.

Flooding Source(s), Pathway(s) & Receptor(s)

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

Storm Babet delivered significant rainfall in the catchment between 19 and 20 October. The nearest rain gauges to Witnesham and Swilland are in Woodbridge and Chantry. At the Woodbridge rainfall gauge there was 52.4mm of rain recorded over a period of 17hrs between 19 Oct and 20 Oct. More than half (31.4mm) of the rainfall was received in just over 4hrs between 06:45am to 11:00am on 20 October. At the Chantry rainfall gauge there was 54.7mm of rain recorded over a period of 18hrs between 19 Oct and 20 Oct.

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.

Parts of Witnesham adjacent to the main river Fynn and its tributaries are within the Flood Alert area for the rivers Deben and Lark. This area is extensive and covers the river Deben catchment from Debenham, to and including Bromeswell, and the river Lark from Clopton to Martlesham.

This Flood Alert was issued on 18th October 2023, and remained in force until its removal on 24th October 2023.

Further upstream, Swilland is not covered by our Flood Warning Service and as such there is no flood alert area which includes Swilland.

There are no flood warning areas for the river Fynn, Witnesham or Swilland as we are unable to offer a reliable advanced warning of flooding for these locations.

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) and the community. Detailed descriptions of each investigation area can be found in the following section.

1. The Street

Following heavy rainfall on the morning of 20 October, extreme water levels flowed down the River Fynn from the upper catchments towards the road bridge on The Street, Witnesham. From late morning onwards the swollen river levels exceeded the capacity of the channel and floodwater flowed across gardens directly towards properties on The Street from the rear, which were then internally flooded to depths of approximately 50cm (see Figure 12).

Residents reported that the road bridge inhibited the high flows, blocking the water from passing along the river. Floodwater also backed up onto the highway either side and over the road bridge (see Images 1 & 2). Surface water flows on the highway coming down the hill added to the extent of the floodwater. Local residents also stated a lack of river channel maintenance downstream of the road bridge, may have contributed to the heightened flood levels. The observed flood extents along The Street match closely with the national fluvial flood risk mapping (see Figure 13).

Figure 12. Approximate flood water flow routes along The Street

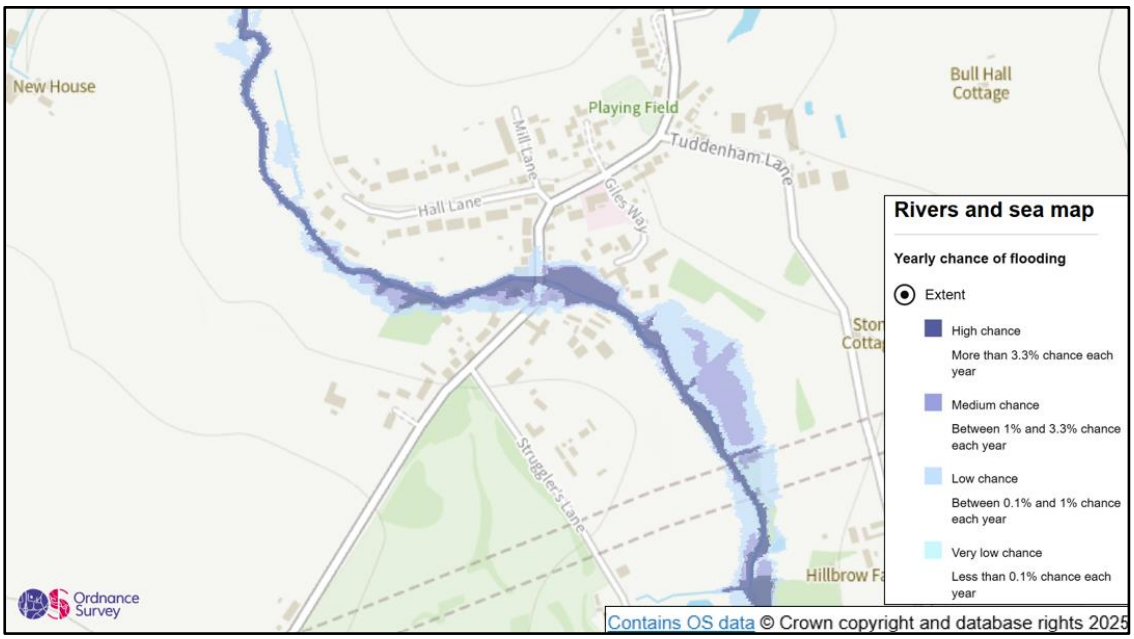

Figure 13. Witnesham flood risk from rivers and the sea

In Summary:

- Heavy rainfall on the morning of the 20 October caused the River Fynn to exceed capacity and the floodwater impacted properties along The Street directly from the rear.
- The flooding may have been exacerbated by the road bridge and a lack of in-channel maintenance downstream, slowing the flow and backing up floodwater toward properties and onto the highway.
- The area around the road bridge on The Street is shown to be at Medium to High risk of fluvial flooding on the national flood risk mapping.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Landowners to carry out appropriate watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Explore potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) in the upper catchments and west of Witnesham.

2. Tuddenham Lane

On the morning of 20 October, intense rainfall caused surface water to flow across the fields to the east and overwhelm the watercourse to the north of the properties on Tuddenham Lane. Some of the floodwater overflowed from the watercourse directly into and across the gardens, impacting the properties from the rear (see Figure 14 below). The majority flowed out onto the highway surrounding the houses from the

front and side as the capacity of the culvert below the road was exceeded (see Image 3). There is a culvert under Tuddenham with a restricted inlet from the upstream watercourse. It was reported that the culvert may have been partially blocked or damaged during the event. The small inlet connection from the channel into the culvert likely acted as a particular pinch point, due to its size, reducing the ability of the pipe to convey the floodwater. The floodwater on Tuddenham Lane reached its highest level sometime between 10 – 11am.

The watercourse received additional surface water flows from the north via a presumed surface water land drain. This additional flow, together with significant quantities of surface water flowing down the highway, greatly contributed to the expanse of floodwater on Tuddenham Lane.

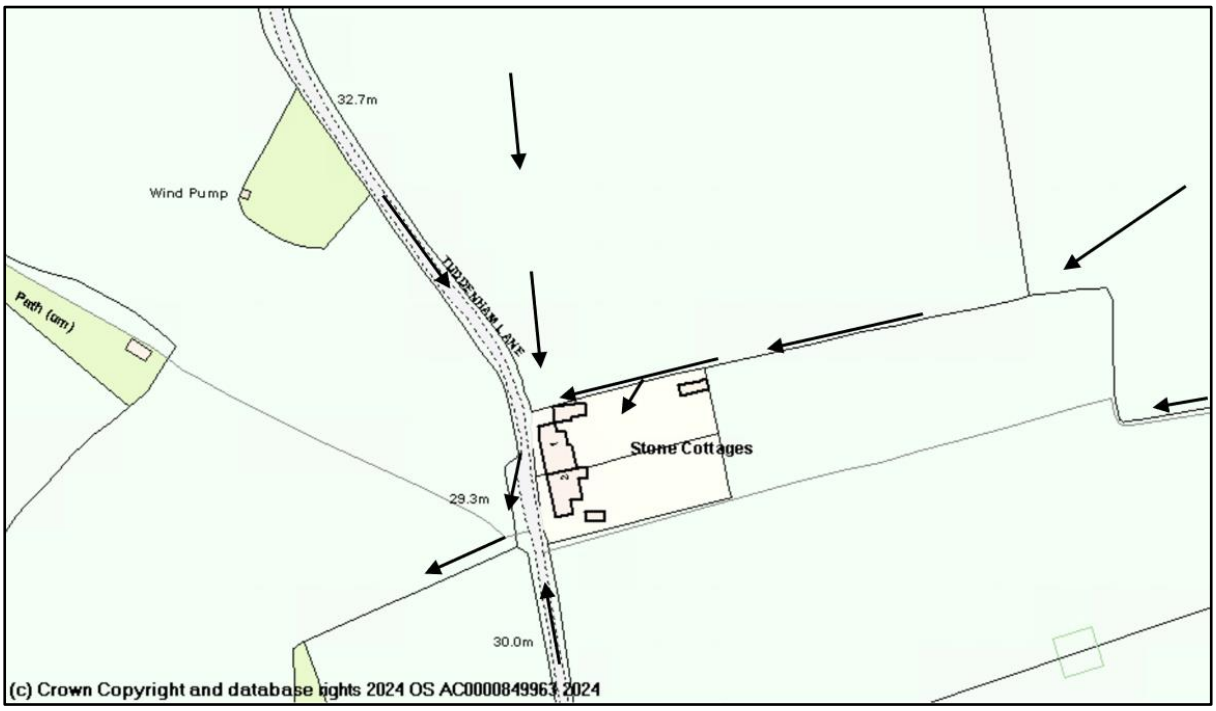

Figure 14. Approximate flood water flow routes on Tuddenham Lane

The floodwater on the highway was unable to drain away, as the highway gullies and kerb offlets were blocked up with silt (see Image 4). The roadside ditch was overgrown with vegetation reducing conveyance capacity, and it overflowed further adding to the floodwater (see surface water flood risk on Tuddenham Lane, Figure 16). This ditch has been subsequently cleared post Storm Babet, with the blocking vegetation and debris removed.

Additional flooding also occurred on Tuddenham Lane during storms in November 2023, December 2023 and January 2024.

In Summary:

- Intense rainfall caused large amounts of surface water to flow from the fields to the east along an ordinary watercourse towards Tuddenham Lane.
- The watercourse received additional surface water flows from the north via a presumed surface water land drain, which discharges into a small watercourse near to property.
- Floodwater overflowed from the watercourse impacting properties on Tuddenham Lane and spreading across the highway. The connection between the channel and the culvert below the road is relatively small, this may have acted as restriction.
- Lack of maintenance of the roadside ditch together with blocked highway gullies slowed the flow of the floodwater off the road.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Suffolk Highways to CCTV the culvert below the road from the watercourse connection to the brick outfalls, to check for blockages, capacity size and or defects and fully establish the drainage routes.
- The landowner in liaison with Suffolk Highways, to investigate the feasibility of upsizing the connection from the watercourse to the culvert.
- Suffolk Highways to investigate the feasibility of enlarging the culvert under Tuddenham Lane.
- Suffolk Highways to investigate options to improve surface water drainage from the highway into the roadside ditch.
- Landowners and LLFA to investigate if the surface water flows coming into the watercourse from the north, can be attenuated or re-directed to reduce flood risk.
- Investigate potential NFM projects to ‘slow the flow’ and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) east of Witnesham.
- Suffolk Highways to ensure the completion of highway drainage asset cyclic maintenance on Tuddenham Lane.

3. Mow Hill

Properties on Mow Hill were internally flooded by surface water runoff from a combination of sources. Following heavy rainfall on the morning of 20 October, large amounts of uncontrolled surface water runoff from the Witten's Meadow development site (in construction on 20 October), were observed flowing into a private piped watercourse and down the footpath / right of way towards properties on Mow Hill (see Image 5) - see Appendix 1 for relevant information relating to planning permission.

There is a natural drainage feature known as 'the Gull', situated on this tributary, upstream of the impacted properties. The Gull can attenuate water due to a downstream damboard structure, designed as a flow control, which causes water to be held in the Gull. Downstream from the damboards, the watercourse is assumed to be piped. See Figure 15 for an overview of the drainage features in this location.

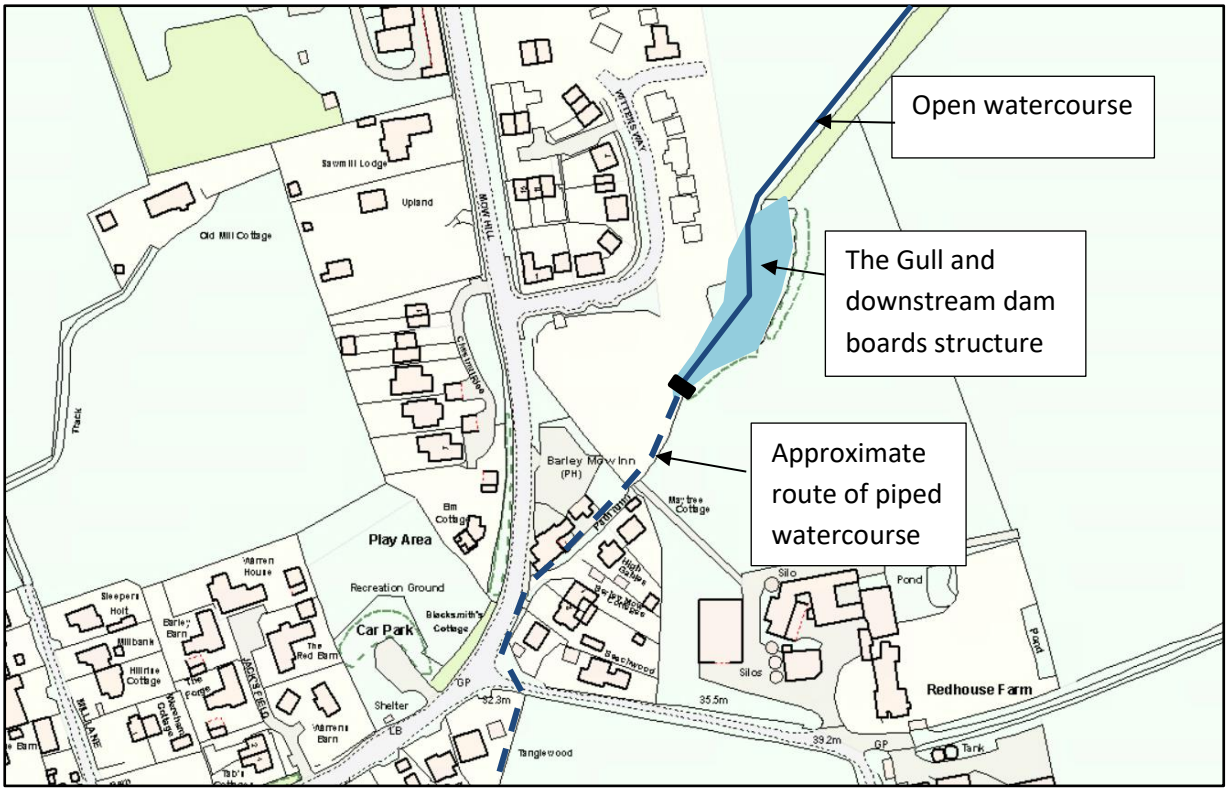

Figure 15. Watercourse and features north of Tuddenham Lane

During Storm Babet, excess flows from adjacent farmland flowed overland to the south and west, bypassing the Gull and converged with flows from the development site before flowing overland towards Mow Hill. This flow is in addition to water in the piped watercourse that was flowing at full capacity. Surface water on the highway also added to the floodwater flows on Mow Hill and into the piped watercourse (see Figure 16).

The amount of water flowing into the piped watercourse far exceeded its capacity, resulting in floodwater surcharging from manhole covers along its length and directly flooding adjacent properties from the front (see Image 6). Significant internal flooding of the properties began from late morning onwards, with highest floodwater levels reported around 2pm. Some properties were entirely surrounded by the floodwater.

Surface water flowing on the highway from Tuddenham Lane direction added to the growing expanse of floodwater, which could not drain away as highway drainage assets and the receiving piped watercourse were overwhelmed.

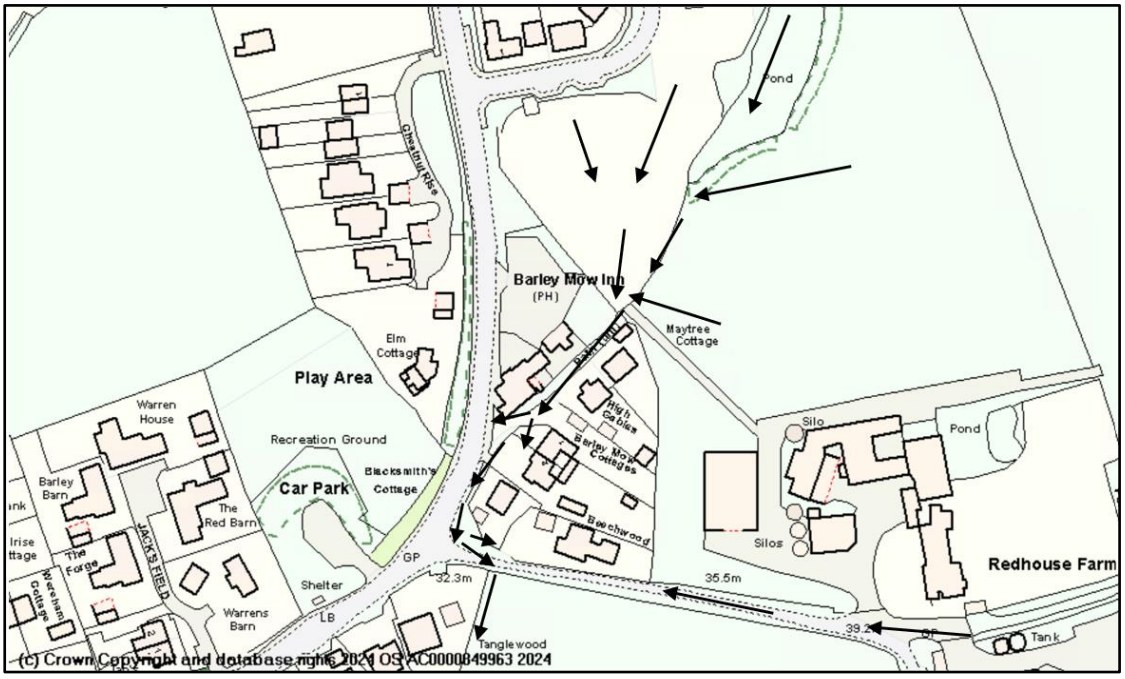

Figure 16. Approximate floodwater flow routes on Mow Hill

Prior to Storm Babet the piped watercourse, that travels from the Gull, had failed (possibly due to an unknown blockage) and surcharged, creating a hole in the garden of a property next to the Giles Way estate. During Storm Babet water emerged from the hole, flowed overland and down Giles Way before entering a surface water sewer system and into the River Fynn.

Various CCTV surveys have been completed for sections of the piped watercourse in an attempt to identify the location of the blockage. East Suffolk District Council (ESDC) have undertaken an investigation which concluded the potential blockage which inhibited the flow of water is located on private land.

The ability of the piped watercourse to convey the floodwater during Storm Babet was clearly compromised. This caused a backing up of the floodwater on Mow Hill and increased the flooding. The combined surface water flows from the development site,

adjacent fields and highway runoff, likely exceeded the reduced overall capacity of the piped watercourse.

Post Storm Babet, the Witten's Meadow development site construction works have continued and the surface water attenuation features are now complete and fully operational. The landowner of the field adjacent to the development site has created a shallow bund at the southern corner of the field to mitigate overland surface water flows towards Mow Hill.

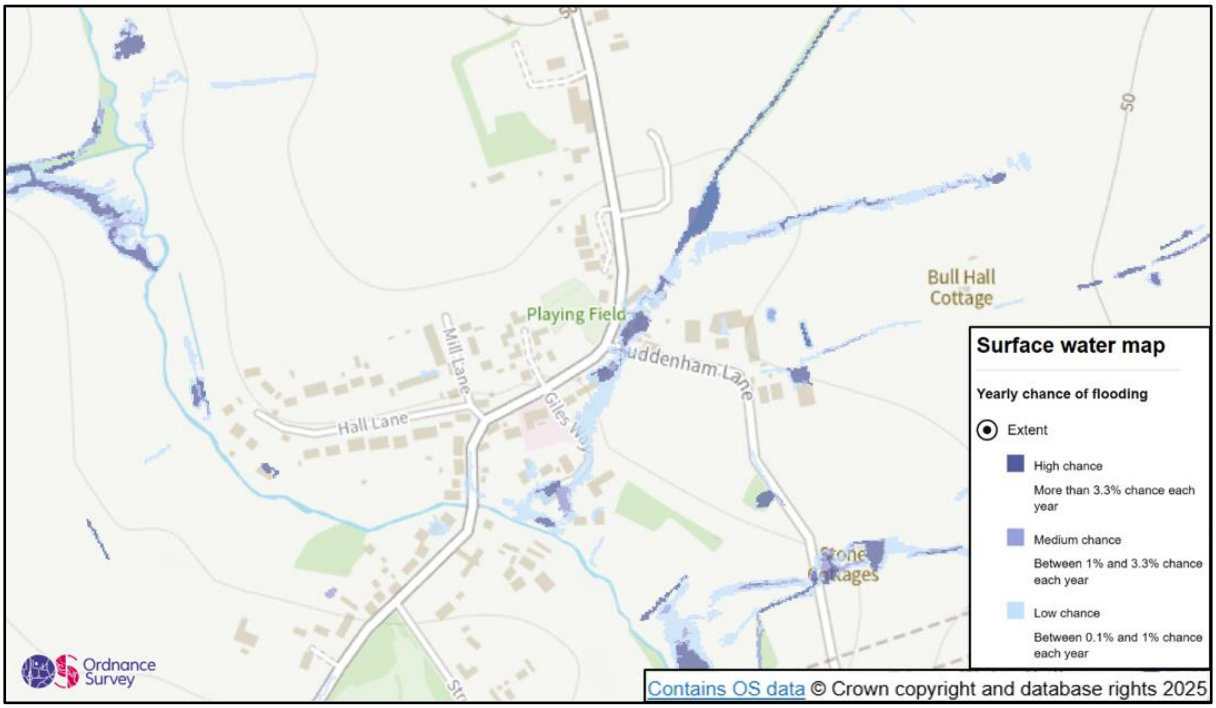

Figure 17. Surface water flood risk on Mow Hill, Tuddenham Lane and The Street

The observed extent and flowpaths of the floodwater in this area correlates closely with the national surface water flood risk map (Figure 16 above), with pluvial flood risk categorised as being medium to high on the affected areas of Mow Hill and Tuddenham Lane.

Additional flooding also occurred on Mow Hill during storms in January 2024.

In Summary:

- Surface water runoff from fields, highway and the unmitigated Witen's Meadow development site combined to flood properties on Mow Hill.
- The required surface water management features had not been constructed on the development site, leading to uncontrolled runoff from recently compacted and surfaced ground across an area of over 2 hectares, making a contribution to the flooding experienced.
- Floodwater from these combined sources flowed into a private piped watercourse exceeding its capacity, resulting in floodwater surcharging from manhole covers and flooding adjacent properties.

- A pre-existing problem with the piped watercourse had already caused external flooding to property next to Giles Way and reduced its ability to convey floodwater during Storm Babet.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) east and northeast of Mow Hill.
- Investigate redirecting land drainage northeast of Mow Hill into 'the Gull' upstream of the existing flow control channel board structure to reduce flows into the piped watercourse system.
- Suffolk Highways to investigate if the existing highway drainage assets on Mow Hill and the Mow Hill / Tuddenham Lane junction are operational.
- Landowners to repair and or improve the drainage capacity of the piped watercourse from Mow Hill to Giles Way.
- Suffolk Highways to ensure the completion of highway drainage asset cyclic maintenance on Mow Hill.
- East Suffolk Council (as Local Planning Authority) and LLFA to implement an improved process to ensure developer compliance with planning conditions that mitigate surface water run off during construction (see Appendix 1 for further details).

4. Upper Street and Weyland Road

The primary source of flooding along Upper Street was pluvial runoff from the surrounding fields. One property cited the lack of maintenance of an overgrown ditch and an unploughed adjacent field as contributing to the drainage and flooding issue. There are also reports of some fields having no drainage feature(s) to intercept the surface water flows, and therefore flood water flowed directly off the field onto property and the highway. The shear amount water was said to have overwhelmed drains outside the property.

On Weyland Road internal flooding occurred from surface water runoff directly from the public footpath. Floodwater impacted the property from the front and rear. There are no drainage assets to intercept floodwater along the footpath. This has been a recurrent issue on Weyland Road with regular flooding experienced after even moderate rainfall.

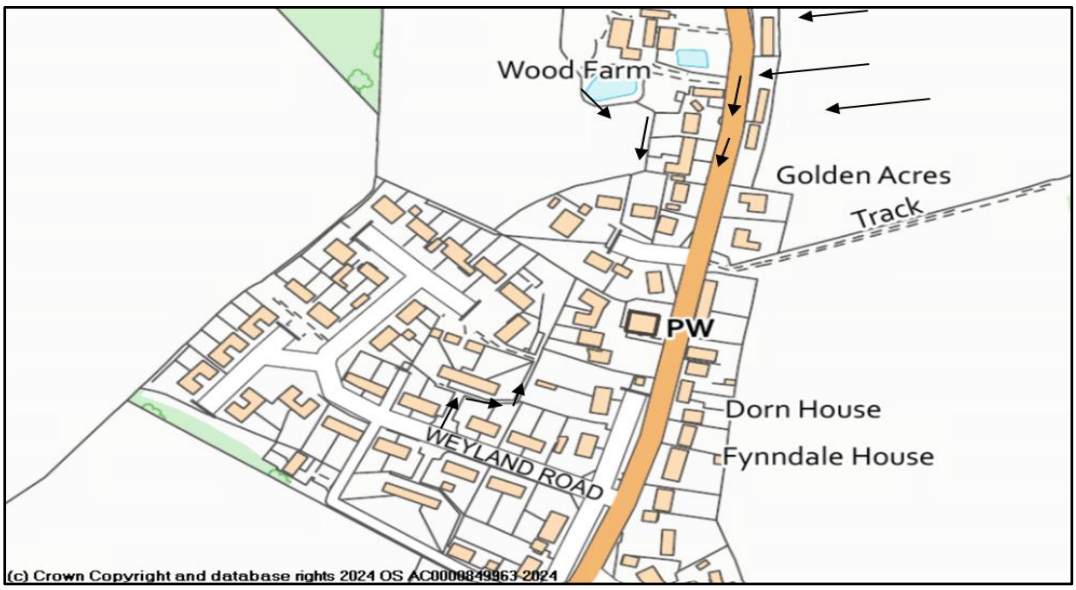

Figure 18. Approximate floodwater flow routes on Upper Street and Weyland Road

In Summary:

- Surface water runoff from surrounding fields impacted properties on Upper Street. Water also flowed from the highway towards properties.
- Blocked highway gullies and a lack of ditch maintenance likely contributed to the flooding.
- On Weyland Road, surface water flowed directly off the footpath across the garden towards property.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Landowners to carry out any ditch/watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Landowners to investigate options for additional drainage features at field boundaries to intercept flood flows from the field before discharging onto the highway.
- Suffolk Highways to ensure the completion of highway drainage asset cyclic maintenance on Upper Street and Weyland Road.
- Landowner of the public footpath off Weyland Road to investigate if the drainage arrangements on the footpath are sufficient.

5. Swilland

The primary cause of flooding in Swilland was pluvial flooding. Surface water run off originated from the hard surfaces (concrete or compacted ground) on the farmyard to the north of the church. Following heavy rainfall on the morning of 20 October, surface water flowed off the site onto Church Lane. The floodwater continued along Church Lane (see Image 7) towards High Road and began pooling around the highway drainage gully near to the road junction. The gully was overwhelmed by a combination of the high volume of runoff and it being blocked up with fallen leaves. As the floodwater on Church Lane increased, it flowed onto the nearby driveway and across the rear gardens of properties on High Road. The houses were flooded internally from the side and rear (see Figure 18) from late morning with levels peaking between 12 – 2pm. There was little to no surface water on the carriageway along this section of High Road.

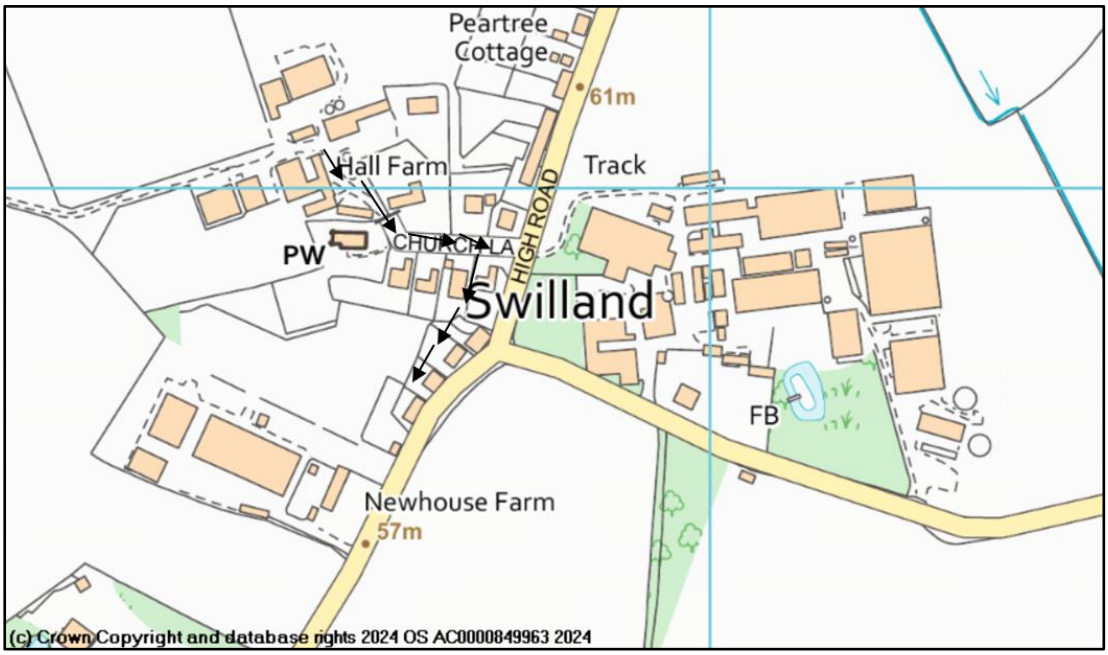

Figure 19. Approximate floodwater flow routes in Swilland

Further south along High road another property was badly impacted by surface water flooding from the fields to the west. The house and garden are lower lying than the field behind which was described by residents as being waterlogged throughout the year. Historically there had been a ditch between the property and the field, this was subsequently infilled with a piped land drain installed.

It is presumed that during Storm Babet the pipe capacity was overwhelmed, with exceedance flows from the fields flowing into the garden and property.

Figure 20. Surface Water flood risk in Swilland

Surface water flooding is characterised as low risk along Church Lane on the national flood risk mapping, and the observed pathway the floodwater followed is not shown (see Figure 19).

In Summary:

- Uncontrolled surface water runoff from the farmyard flowed along Church Lane, overwhelmed the exiting drainage assets and then flowed over driveways and through gardens, flooding properties from the side and rear.
- Further south along High road another property was flooded by surface water runoff from the fields to the west. Ineffective or over-capacity land drainage arrangements, together with the historic infilling of the boundary ditch resulted in flooding to the garden and property.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Landowner of the farm north of the church to explore measures to control excess surface water runoff from the yard onto Church Lane.
- Suffolk Highways to investigate the feasibility of improving the highway drainage along Church Lane.
- Ensure the completion of highway drainage asset cyclic maintenance in Swilland.
- Landowners and property owners on High Road to investigate improving current land drainage arrangements. This could include reinstating historic field ditches to intercept flood flows and or better connect land drainage from the west to the ditch on the east side of the road.

Images of Flooding

Photos included in the report have been submitted via a range of sources, including customer reports, community information and by Risk Management Authorities. The use of photos has been included in good faith to support the investigation and provide further context of the flood event.

Image 1 - Looking north towards River Fynn road bridge

Image 2 - Looking south towards River Fynn road bridge

Image 3 - Watercourse overflowing onto Tuddenham Lane

Image 4 - Floodwater on Tuddenham Lane

Image 5 - Surface water runoff from Witten's Meadow construction site towards Mow Hill (photo looking southwest)

Image 6 - Surcharging manhole outside Barley Mow public house

Image 7 - Surface water flowing along Church Lane, Swilland

Risk Management Authorities, Non Risk Management Authority and flood risk function(s)

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 (LLFA), Highways Authority & Asset Owner
The Environment Agency (EA)	Lead organisation for providing flood risk management under its permissive powers and issuing warnings of flooding from main river
Anglian Water	Asset Owner
East Suffolk District Council	Local Planning Authority (LPA) & Asset Owner
Non-Risk Management Authority	**Relevant Flood Risk Function(s)**
Private Landowners	Riparian responsibilities and management of water from land or watercourses
Private Homeowners	Riparian responsibilities and improving flood resilience to property
Swilland and Witnesham Grouped Parish 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 to date:

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	Risk Management Authority	Progress
Offer of Property Flood Resilience (PFR) measures to the properties that flooded during Storms Babet	Suffolk County Council Lead Local Flood Authority	Ongoing
Ensure riparian landowner responsibilities are understood with regard to watercourse management.	Suffolk County Council Lead Local Flood Authority	SCC published "Flood Smart Living" online and hard copy guide to increasing flood resilience for residents, landowners and communities, December 2024
Gullies on High Road, Swilland cleaned and jetted.	Suffolk County Council Highways Authority	Completed December 2024
Clearance of blockages in main river channel reported following Storm Babet in Witnesham.	Environment Agency (EA)	Complete
Investigations into the private piped watercourse and discussions with landowners on land drains and measures to reduce overland water flow.	Swilland and Witnesham Grouped Parish Council	Ongoing
Field bund created to reduce overland flows towards Mow Hill.	Private landowner	Complete

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 Witnesham and Swilland. 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
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	Swilland and Witnesham Grouped Parish Council	6 months	
Maximise the take up of the £5k PFR Grant currently available to residents before the April 2025 deadline	SCC LLFA / Residents	2 months	
Understand the annual event probability of the rainfall & river flow across the region	EA	6 months	
Ensure the completion of highway drainage asset cyclic maintenance across Witnesham and Swilland	SCC Highways Authority	Annually	Ongoing. Routine cleansing of the gullies will be completed in line with the set cycles (annual or biennial).
Utilise the Community Self Help scheme to undertake minor maintenance activities	Parish Council / SCC Highways Authority	6 -12 months	
Introduce pro-active observation of Construction Surface Water	SCC LLFA, East Suffolk Council – Local Planning Authority	6 months	

Management Plan compliance when developments commence (as per updated condition above). Ensure developers better communicate their implementation of mitigation.			
Investigate the adoption and/or ownership of the Giles Way surface water system.	Anglian Water	6-12 months	
Medium Term Actions (e.g. longer planning timescales and potential need to source funding but potential for greater impact)			
Explore potential NFM projects to 'slow the flow' and attenuate water on overland flow paths affecting The Street, Tuddenham Lane, Mow Hill E.g. leaky dams, woody debris installation, restoration of watercourses	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12 - 24 months	
Explore potential NFM measures which aim to attenuate water in the upper catchments e.g. storage ponds, wetland areas. Primary areas are the upper catchments of Mow Hill, Tuddenham Lane and the Street.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA, IDB)	12 - 24 months	
Investigate if there is any potential for additional highway drainage assets on Church Lane, Swilland to better manage surface water flows.	SCC Highways Authority	12 - 24 months	
CCTV the culvert below Tuddenham Lane from the watercourse connection to the brick outfalls, to check for blockages, capacity size and or defects and fully establish the drainage routes.	SCC Highways Authority	12 - 24 months	

Investigate the feasibility of upsizing the connection from the ordinary watercourse to the culvert under Tuddenham Lane.	SCC Highways Authority and Landowner	12 - 24 months	
Investigate the feasibility of enlarging the culvert under Tuddenham Lane.	SCC Highways Authority	12 - 24 months	
Investigate options to improve surface water drainage from the highway into the roadside ditch on Tuddenham Lane.	SCC Highways Authority	12 - 24 months	
Investigate if the surface water flows coming into the ordinary watercourse (east of Tuddenham Lane) from the north, can be attenuated or re-directed to reduce flood risk.	Landowners, supported by LLFA	12 - 24 months	
Investigate the options for redirecting land drainage northeast of Mow Hill into 'the Gull' upstream of the existing flow control channel board structure to reduce flows into the piped watercourse system.	Landowners, supported by LLFA	12 - 24 months	
Investigate the adequacy of the existing highway drainage assets on Mow Hill and Mow Hill / Tuddenham Lane junction.	SCC Highways Authority	12 - 24 months	
Riparian landowner to repair piped watercourse to	Landowner, supported by LLFA	12 - 24 months	

reinstate flow from Mow Hill to Giles way.			
Investigate opportunities to update development plan policy in Neighbourhood Plans or any potential Joint Local Plan site allocation(s) which identify risks and opportunities to mitigate flood risk issues as development comes forward.	Local Planning Authority, SCC LLFA	12 months+	
Investigate options for installing additional drainage features at field boundaries to intercept flood flows, along Upper Street and High Road.	Landowners, supported by LLFA	12 - 24 months	
Investigate if the current drainage arrangements on the footpath off Weyland Road are sufficient and if subsequent improvements are required.	Landowner, supported by LLFA	12 - 24 months	
Investigate measures to control excess surface water runoff from the yard onto Church Lane, i.e. SuDS systems.	Landowner, supported by LLFA	12 - 24 months	
Investigate the potential to improve highway drainage along Church Lane, Swilland.	SCC Highways Authority	12 - 24 months	
Long Term actions (significantly longer timescale and budget required with potentially greater positive impact)			
Deliver improvements to highway drainage network to manage surface water flows if investigation works suggest it is beneficial and viable	SCC Highways Authority	TBC	

Installation of NFM features within upper catchments to attenuate and slow flood water if investigation works suggest it is viable	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	

Approval

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

Reviewer	Date of Review

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 1 – Witten's Meadow Development Site, Mow Hill

Information relating to Planning permission:

During the storm, development was underway on land east of Mow Hill (known as the Witten's Meadow development), the development permitted by the planning permission below was being carried out by Denbury Homes:

DC/22/0998/FUL | Residential development of 32 dwellings, together with areas of new public open space and the provision of a new access to the site from the B1077 | Land East Of B1077 Mow Hill Witnesham Ipswich Suffolk IP6 9EH

Relevant Condition:

> 33. No development shall commence until a Construction Surface Water Management Plan (CSWMP) detailing how surface water and storm water will be managed on the site during construction (including demolition and site clearance operations) has been submitted to and agreed in writing by the LPA. The CSWMP shall be implemented and thereafter managed and maintained in accordance with the approved plan for the duration of construction. The approved CSWMP shall include:
>
> Method statements, scaled and dimensioned plans and drawings detailing surface water management proposals to include:
>
> i. Temporary drainage systems
> ii. Measures for managing pollution / water quality and protecting controlled waters and watercourses
> iii. Measures for managing any on or offsite flood risk associated with construction
>
> Reason: To ensure the development does not cause increased flood risk, or pollution of watercourses or groundwater https://www.suffolk.gov.uk/roads-and-transport/floodingand-drainage/guidanceon-development-and-flood-risk/construction-surface-watermanagement-plan/

That condition had been discharged on 25 August 2023 with approved details in the application below:

DC/23/2682/DRC | Discharge of Condition No. 33 of DC/22/0998/FUL - Residential development of 32 dwellings, together with areas of new public open space and the provision of a new access to the site from the B1077 - Construction Surface Water Management Plan. Construction Surface Water Management Plan Future Maintenance of Drainage Systems | Land East Of B1077 Mow Hill Witnesham Ipswich Suffolk IP6 9EH

The detail submitted to discharge that condition included:

“The surface water storage and infiltration areas will be the first areas to be constructed so a drainage outfall will be available immediately.”

On 20th October the development included:

- Roads constructed but not yet with tarmac applied.
- Access formation onto Mow Hill.
- Almost full site stripping of soil and reprofiling
- Construction of an off-site construction and parking compound (to the east of the site)
- Deposition of stripped soil and formation of a large soil mound (to the east of the site)
- Construction of foundations and ground floors of 11 buildings.
- Widespread soil compaction on the site and to its east and south due to earth moving plant.

On 20th October no Construction Surface Water Management measures, as detailed in the discharge of condition 33 had been implemented. The location where the drainage basin should have been constructed was partly a storage and parking compound area and partly un-disturbed due to a badger sett which was subject to a licence from Natural England (issued o 27th November 2023) to allow for its removal, which the developer had confirmed would be carried out on 31st October 2023.

Ultimately the developer had failed to comply with their required mitigation of construction surface water run off over an area of ground compaction of over 2 hectares in area.

The large amount of surface water which was unattenuated on site in the absence of the surface water management features which had not been constructed before any other development began was observed flowing south into The Gull and accumulating at the entry into the piped watercourse. This was immediately recognised as a potential contribution to the flooding.

Therefore, East Suffolk Council, following consultation with the Lead Local Flood Authority, issued a temporary STOP notice on 27th October 2023 prohibiting any further building on site until the attenuation features had been constructed.

Post event analysis and proposed action:

East Suffolk Council and the Lead Local Flood Authority had taken the correct pre-emptive action in requiring a Construction Surface Water Management Plan prior to the commencement of the Witten’s Meadow development and approving this subject to the committed mitigation and safeguards from surface water run-off being installed prior to any other works. However, the process of compliance with conditions on planning permissions is not subjective to pro-active LPA or LLFA inspection of works

(consistent with almost all other planning conditions on developments. However, the risk identified on this site has led to an alternative form of condition being promoted for use in higher risk locations, that is set out below:

> No development shall commence until details of a Construction Surface Water Management Plan (CSWMP) detailing how surface water and storm water will be managed on the site during construction (including demolition and site clearance operations) is submitted to and agreed in writing by the LPA. The CSWMP shall be implemented and thereafter managed and maintained in accordance with the approved plan for the duration of construction. The approved CSWMP shall include:
>
> Method statements, scaled and dimensioned plans and drawings detailing surface water management proposals to include:
> i. Temporary drainage systems
> ii. Measures for managing pollution / water quality and protecting controlled waters and watercourses
> iii. Measures for managing any on or offsite flood risk associated with construction
> **iv. A communication plan to document and communicate the implementation and progress of construction of CSWM mitigation on the site.**
>
> **The LPA and Lead Local Flood Authority shall be notified a minimum of 10 working days prior to commencement of development with a detailed programme of the works contracted to implement the CSWMP. The LPA and Lead Local Flood Authority shall then be notified upon completion of the CSWM mitigation and be invited for inspection.**
>
> Reason: To ensure the development does not cause increased flood risk, or pollution of watercourses or groundwater.