# Section 19 Flood and Water Management Act 2010

## Charsfield Flood Investigation – Storm Babet 2023

| | Name | Date |
|---|---|---|
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# Contents

# Figures



# Images

# Executive Summary

Storm Babet caused significant disruption to communities across Suffolk between 18th-21st October 2023. Charsfield was a community that was significantly impacted, with over 20 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.

Charsfield is located in an area at significant risk of both fluvial (river) and pluvial (surface water) flooding and the nature of the surrounding topography and geology contributes to the susceptibility of the community to flooding. Areas of Charsfield are low-lying, surrounded by a reasonably steep rural catchment. There are multiple flow paths flowing into Charsfield from the higher ground from the north, south, and west of the village, before converging in the village where the gradient is noticeably shallower. The local geology and soils are characterised as having low permeability and high run off, making a high number of properties in Charsfield 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 Charsfield were widespread and for the purposes of this report, the affected areas have been categorised into five distinct 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) and the community.

A comprehensive summary for each zone is provided within the report, outlining the context of the event and the impact. Key findings are that Charsfield was 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 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 Charsfield. For short term measures, key highlights include the implementation of community flood plans, maximising Property Flood Resilience (PFR) grants, removal of blockages within watercourses, as well as investigations into local drainage infrastructure. 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.

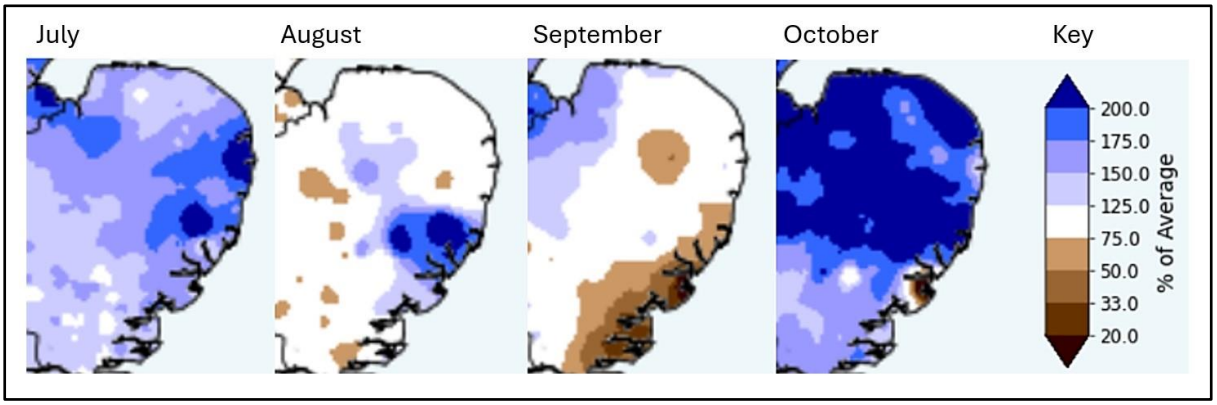


*Figure 1 - Average rainfall in East Anglia between July and October 2023 as a percentage of the historical average monthly rainfall*

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

Charsfield is a small Suffolk village situated approximately 12 miles northeast from Ipswich. Charsfield sits in the Potsford Valley (see Figure 2). The centre of the village is 25 metres above sea level, with relatively steep valley sides rising to over 40 metres. The surrounding area is characterised by arable farming with pockets of woodland in a gently undulating landscape. Fruit farms formerly dominated the valley but many of the orchards have subsequently been turned over to arable use.

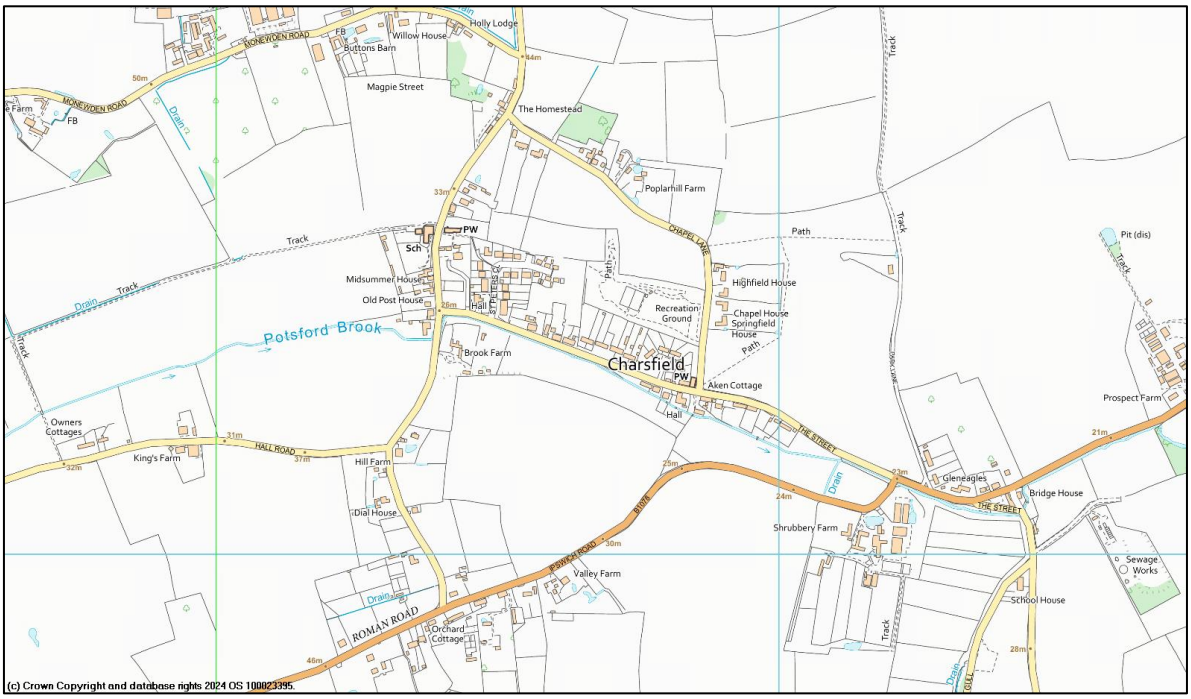


*Figure 2 - Investigation area map*

On the 20th of October 2023, Storm Babet resulted in significant rainfall across Suffolk on already saturated ground due to above average rainfall in the preceding weeks. This caused internal flooding to properties; residential and commercial, across the county from various flooding sources. The following report is focused on Charsfield and will discuss the probable flooding sources, the observed flow paths through the community, and the receptors which have been affected.

Charsfield was significantly impacted during Storm Babet with over twenty properties reporting internal flooding. The village experienced major flooding on Friday 20 October from fluvial (water from an ordinary watercourse or main river), pluvial

(surface water run-off) sources and both combined. For the purposes of this report, the term 'floodwater' may be used to describe both fluvial and pluvial flooding.

The majority of the flooding to properties on Church Road and The Street included some fluvial element due to the Potsford Brook watercourse exceeding capacity and overtopping its banks. The designated main river section begins at the road bridge on Church Road (see Figure 3). Surface water run-off played a greater role in the flooding experienced on Monewden Road, Chapel Lane and St Peters Close.

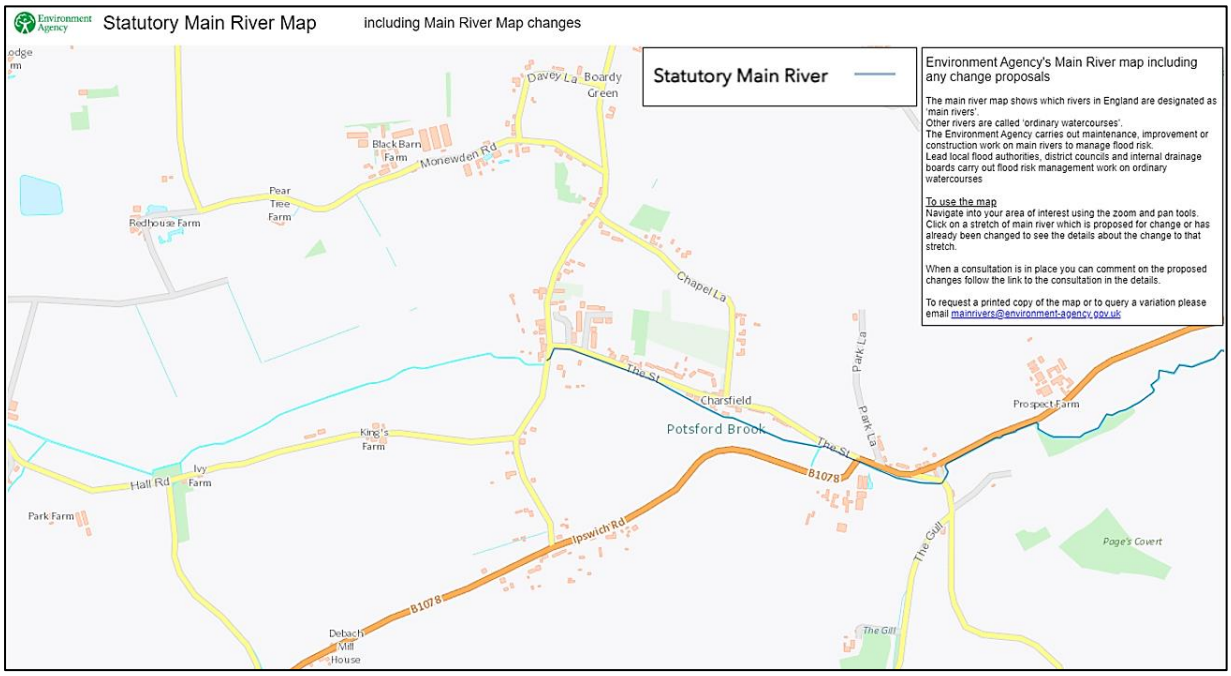


*Figure 3 - Main River map*

Charsfield is within the wider Flood Alert area of "The Rivers Deben and Lark" (code 054WAFSF4AC). This is an extensive area and includes the River Deben from Debenham, to and including Bromeswell, and the River Lark from Clopton to Martlesham. This flood alert area is triggered from rising river levels reaching a trigger threshold from the issuing gauges at either Debenham, Clopton or Brandeston.

In England, the Environment Agency provides 3 types of flood warning:

- flood alert – issued when flooding is possible
- flood warning – issued when flooding is expected
- severe flood warning – flooding could be a risk to life and significant disruption to communities

Ahead of 20 October 2023, a flood alert was issued on 18 October 2023 at 22.12pm, as a result of the water level reaching the threshold at Clopton. This flood alert was in force until it was removed on 24th October 2023 at 08:17am.

Currently the Charsfield area is not covered by a flood warning. The community lies within the upper catchment, and there is no upstream telemetry to enable the Environment Agency to issue a flood warning with enough lead time to enable a response.

For the purposes of this investigation the various areas affected by flooding have been separated into five distinct zones (see Figure 4). The zones are as follows:

1. Monewden Road.
2. St. Peters Close.
3. Church Road and Hall Road.
4. The Street.
5. Wickham Market Road

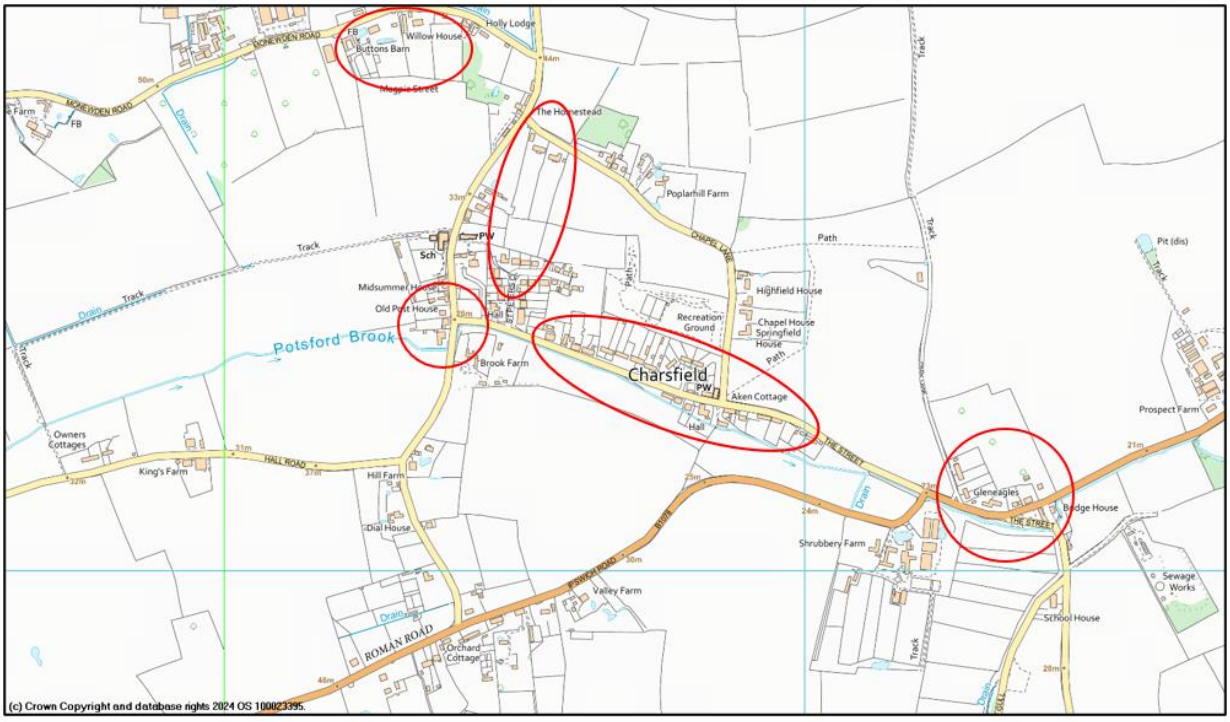


*Figure 4 - Investigation area map with zones*

### 3. Records of any historical flooding

A review of Suffolk County Council's highway reporting tool, local media reports, social media sources and Environment Agency records indicate that Charsfield has been infrequently impacted by flooding to varying extents in the past. A summary of recent historical flooding events in Charsfield include:

Widespread flooding across Suffolk in October 1993. With Charsfield suffering from general runoff from land and road and an overflowing stream/ditch.

At the junction of Chapel Lane and The Street a blocked / overflowing drain and flooded road / pavement was reported to SCC in January 2021. At the junction of Church Road and The Street a blocked highway drain was reported in January 2016

and flooded road / pavement was reported on three occasions in 2022 (April, August & November).

On 9 May 2023 four properties are reported to have flooded. Two main locations in Charsfield were impacted: properties surrounding the junction of Chapel Lane and The Street and separately, properties on St Peters Close.

These locations were also affected by flooding during Storm Babet and may represent some of the areas of Charsfield most susceptible to flooding.

## 4. Predicted flood risk

Parts of Charsfield show significant flood risk from pluvial and fluvial sources.

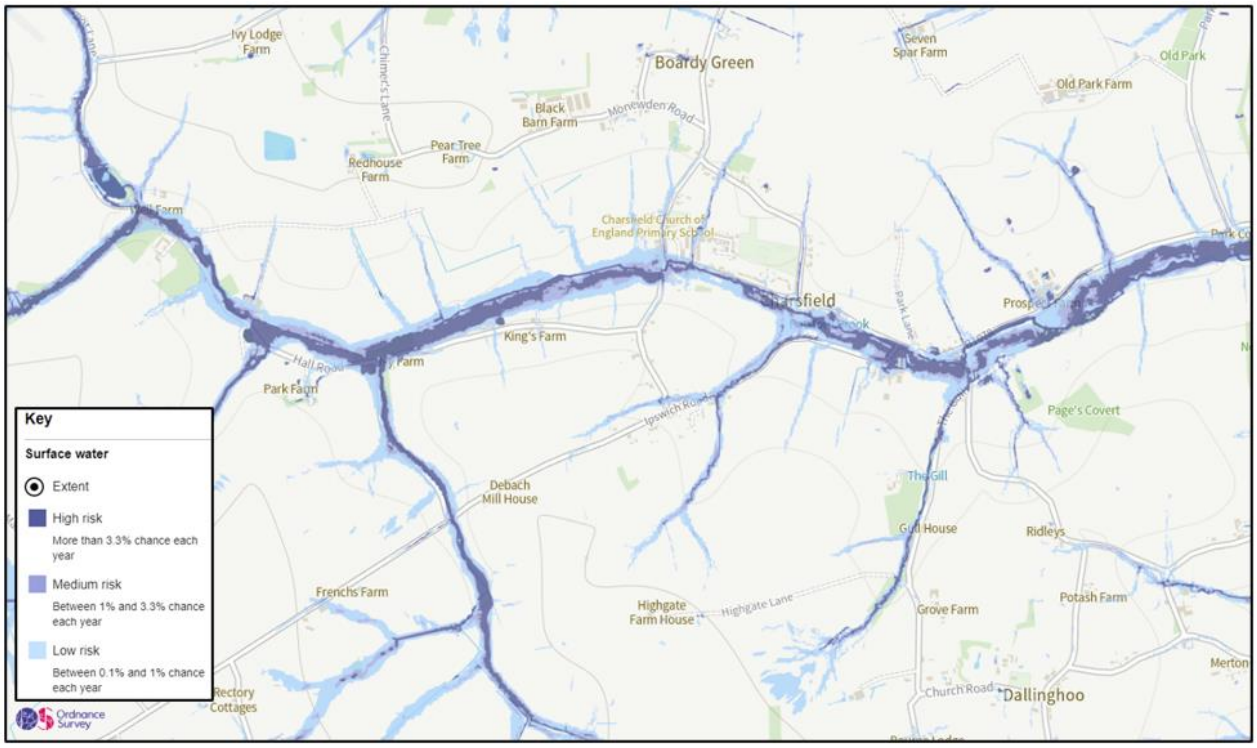


*Figure 5 - Predicted surface water flood risk*

Figure 5 highlights the predicted pluvial (surface water run-off from surrounding land) flood risk within Charsfield, with multiple floodwater flow paths flowing into the village. There is significant risk of surface water flooding in Charsfield, with Chapel Lane, St. Peters Close, Church Road, Hall Road and The Street all identified to be at risk. These areas were affected by flooding during Storm Babet.

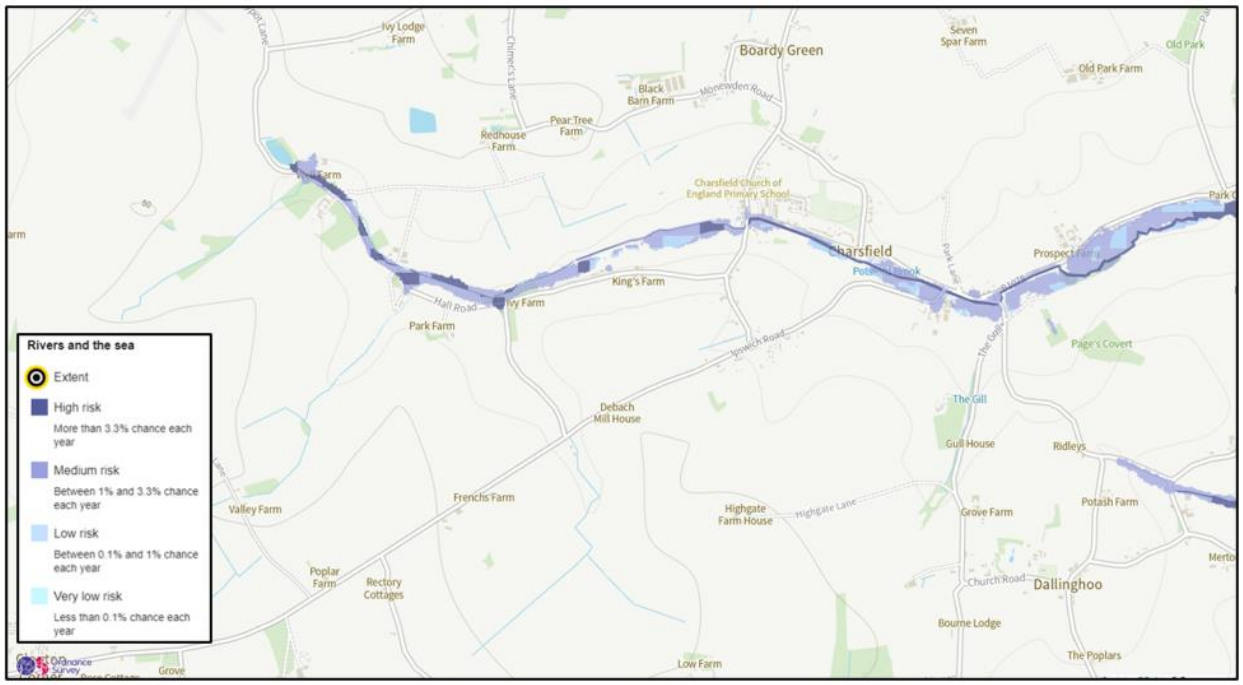


*Figure 6 - Predicted flood risk from rivers and sea*

Figure 6 highlights the predicted fluvial (from ordinary watercourse and main river) flood risk within Charsfield. The main fluvial influence is the Potsford Brook, a tributary of the River Deben. Church Road, The Street and Wickham Market Road are shown as being at risk from fluvial flooding. These areas were affected by flooding during Storm Babet.

## 5. Catchment characteristics

The area surrounding Charsfield is characterised by arable farming with isolated pockets of woodland. Charsfield sits in a valley with the land rising to the north, south and west of the village (see Figure 7). There are multiple overland pluvial flow paths flowing into Charsfield from the higher ground north (Church Road, Chapel Lane, St Peters Close), south (Ipswich Road/B1078) and west of the village, before converging in the village where the gradient is noticeably shallower (The Street). The valley where Charsfield is situated therefore acts as a storage area during intense rainfall events, retaining excess flood water as it slowly discharges into the Potsford Brook and down the River Deben catchment. Overwhelmed drainage infrastructure and watercourses may be observed during these events.

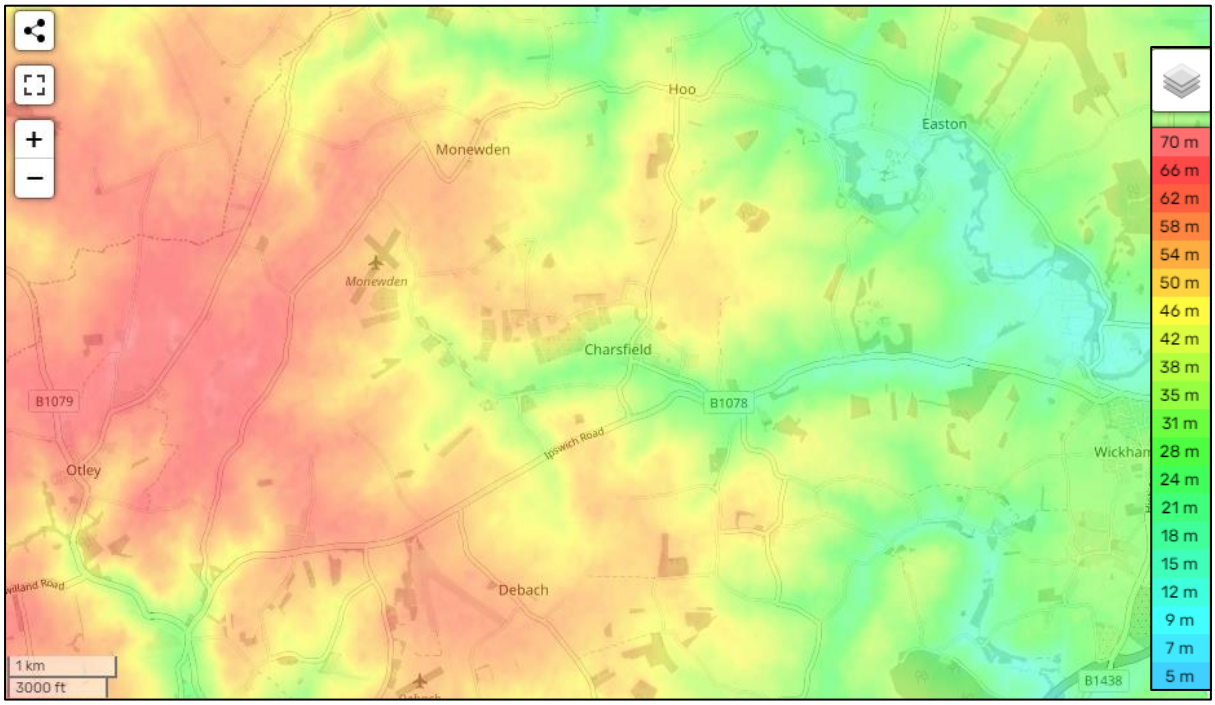


*Figure 7 - Charsfield and surrounding topography*

Figure 8 shows the higher elevations surrounding Charsfield. Surface water falling onto the wider catchment drains towards the Potsford Brook valley in which Charsfield sits and flows east towards the main river Deben and Wickham Market.

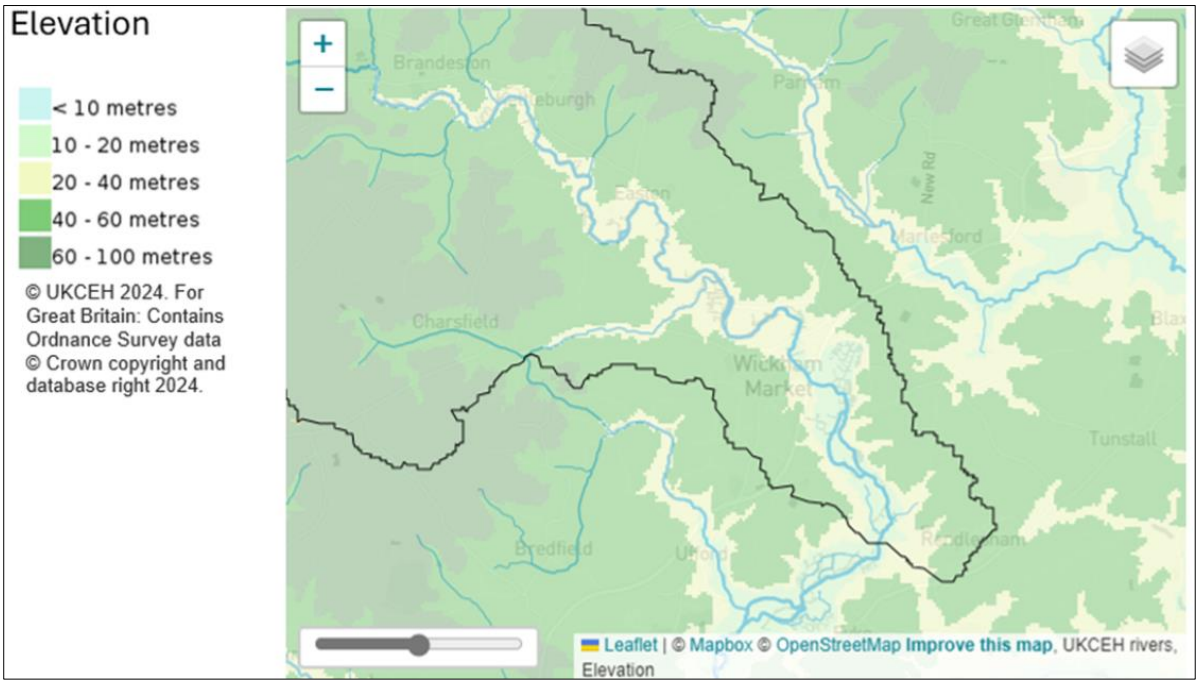


*Figure 8 - Charsfield elevation and catchment boundary*

The Street and Wickham Market Road are among the lowest lying locations in Charsfield. These were identified as being some of the worst affected areas during Storm Babet.

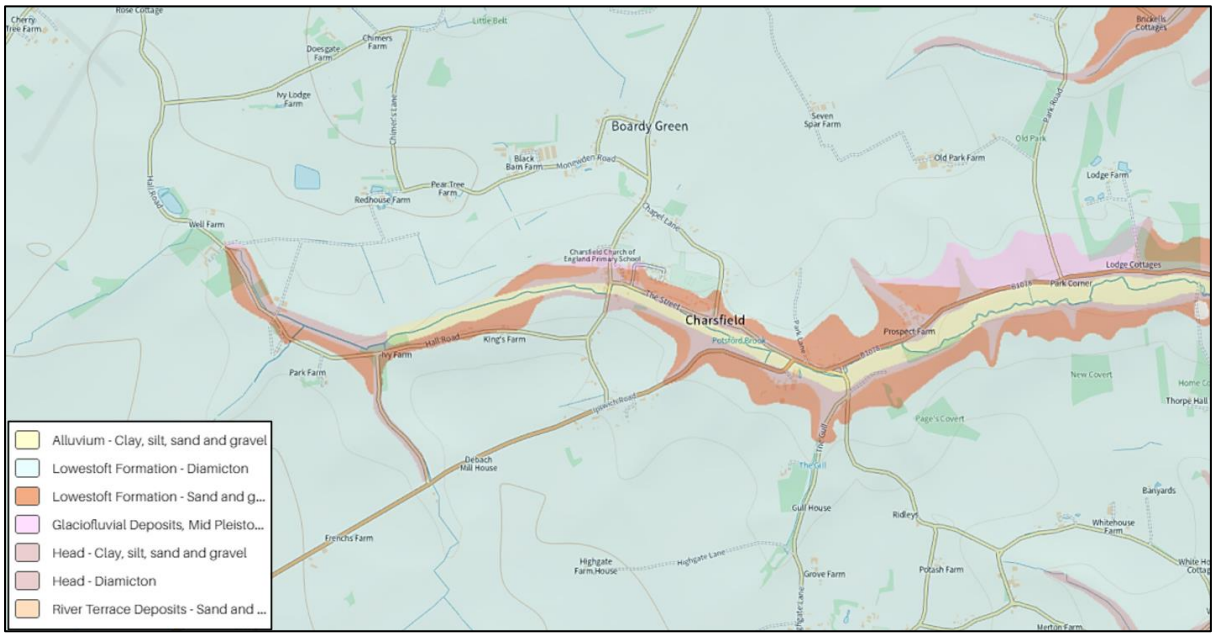


*Figure 9 - Charsfield Village and details of the superficial geology of the area (British Geological Survey, 2024)*

The predominant superficial geology surrounding Charsfield 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 soil generally has a low permeability meaning water will tend to flow off it before it can infiltrate, which reflects the reports collected during Storm Babet.

The soils surrounding Charsfield are diverse with the majority of the north and west of the catchment being made up of soils with clayey make up and an impeded drainage, however through central Charsfield there is a large portion of alluvium and sandy soil which would allow for good infiltration in typical conditions. It should be acknowledged that during Storm Babet, it is possible that saturated conditions in the ground leading up to the event could have prevented some of this infiltration.

With reference to soils in the wider catchment, immediately around Charsfield, they are described as loamy and clayey soils with slightly impeded drainage (see Figure 10). At the higher levels surrounding the town, the soil is described as slowly permeable, seasonally wet, loamy and clayey soils with impeded drainage / reduced infiltration (LandIS, Cranfield University, 2024). Lower rates of infiltration to ground means that more surface water will stay on the surface and not be absorbed, potentially contributing to flood water.

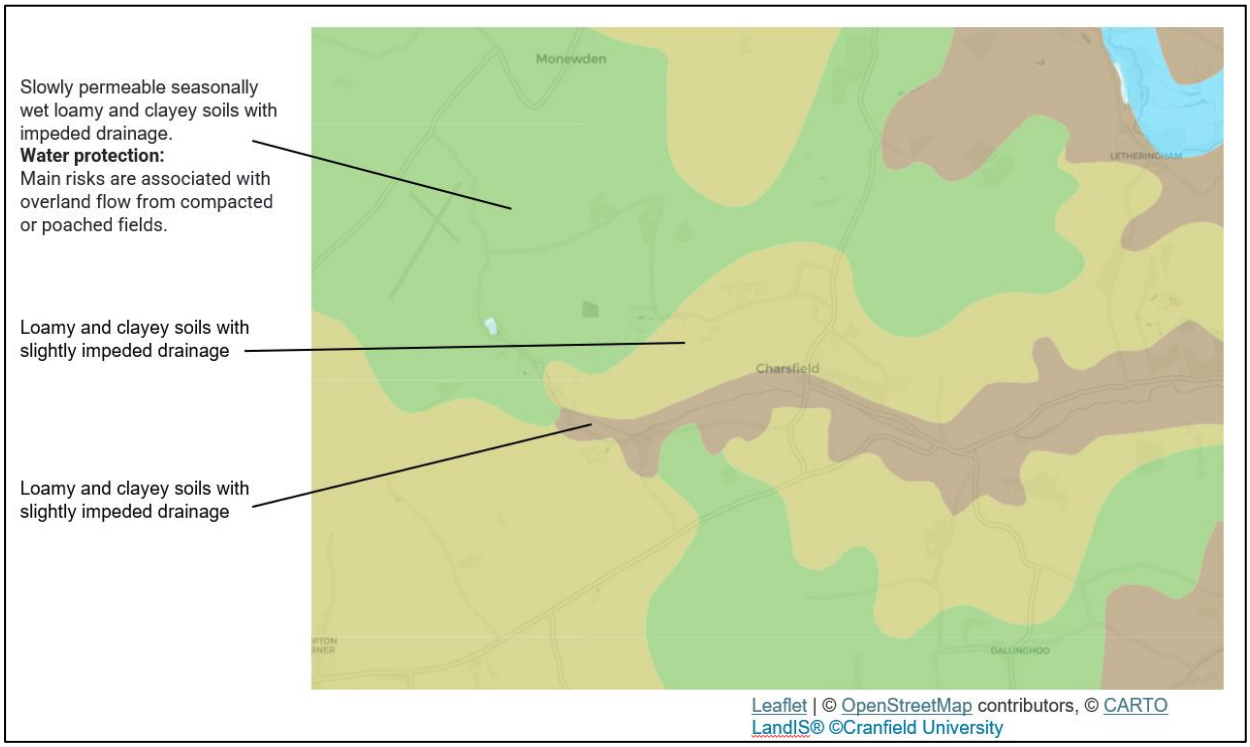


*Figure 10 - Charsfield and surrounding soils*

The topography, geology and soils within the catchment make Charsfield susceptible to extreme rainfall events, with high run off and limited permeability in much of the catchment. Saturated ground and high rainfall, like that experienced during Storm Babet, will further increase the vulnerability of the village to localised flooding.

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

The low-lying nature of Charsfield, with its several flow paths and low permeability of surrounding soils make it susceptible to flooding events in extreme rainfall. 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 river Deben catchment between 18th and 21st October. In Charsfield, the Met Office recorded 46mm on 19 October and 33.2mm on 20 October. The heaviest rainfall was reported in the morning, between 7:00am and 11:00am. At Benhall Green rainfall gauge near Saxmundham (approx. 11 miles east of Charsfield) there was 44mm of rain recorded in a 12-hour period. At Earl Soham rainfall gauge (approx. 6 miles north of Charsfield), 68mm was recorded in 21 hrs. More than half of this rainfall (35mm) was received in 3 hours from 8:30 am to 11:30 am. Various anecdotal reports indicate a spike and sharp increase in the water level of Potsford Brook between 12:00 and 1:00pm. The intensity of the rainfall and rapid rise in water levels meant little, if any, forewarning was provided in Charsfield.

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. Monewden Road

Monewden Road experienced flooding from surface water run-off from the adjacent fields to the north, combining with surface water flowing down the highway on Davey Lane (see Figure 11). Parts of Davey Lane are shown as being at High Risk from surface water flooding on the national predicted flood risk mapping. There is a lack of highway drainage assets along the length of Monewden Road and the gullies that are present were overwhelmed by the intensity of the rainfall on the morning of 20 October. Several of the properties along Monewden Road are situated lower than the road with downward sloping driveways which could facilitate flowpaths for the flood water. The internal flooding was reported to have occurred before midday which corresponds with the intense morning rainfall shown in the rainfall gauge data across the county. The flood water in this area is reported to have receded by early evening.

In summary:

- High rainfall resulted in large amounts of surface water run-off coming from fields to the north on to Monewden Road.
- Surface water also flowed down Davey Lane onto Monewden Road impacting properties from the front.
- The limited number of drainage assets on the highway were temporarily overwhelmed.

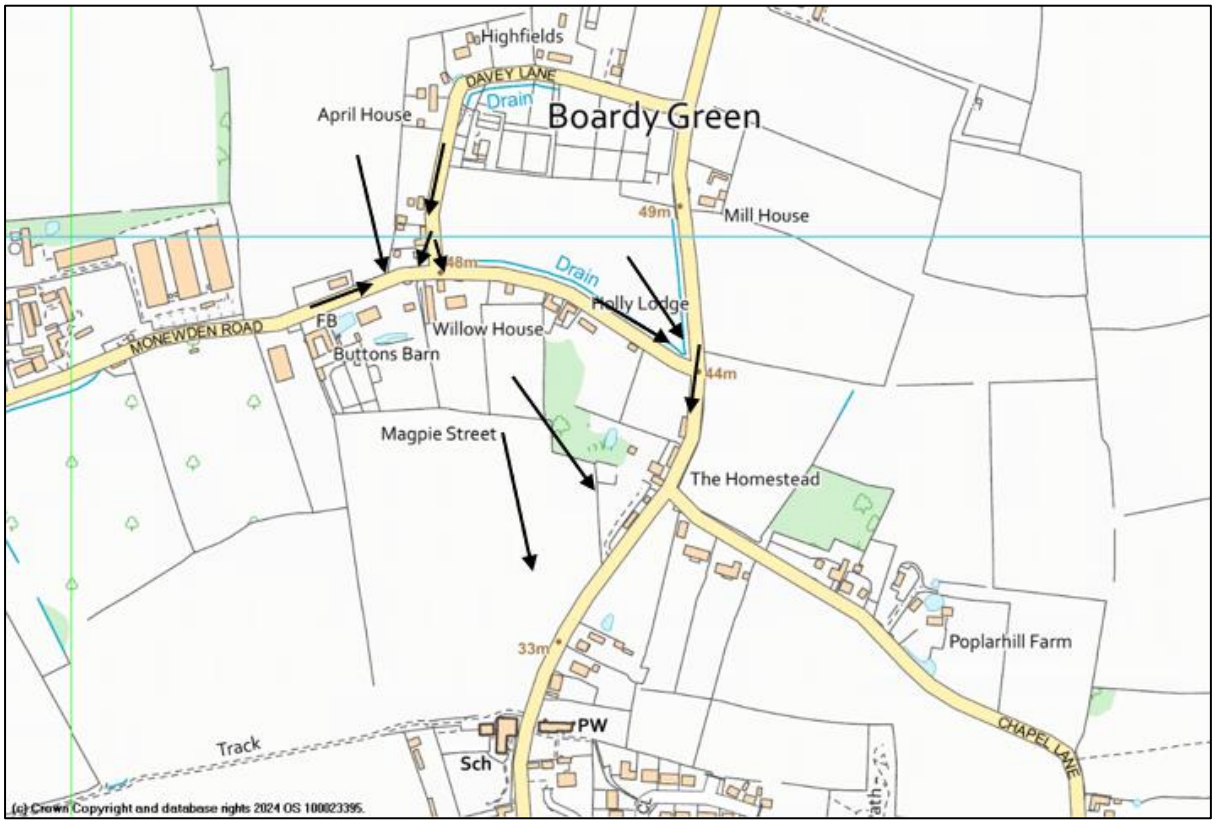


*Figure 11 - Approximate flood water flow routes on Monewden Road*

LLFA recommended action(s):

- Landowner to undertake any required maintenance of the ditch on the north side of Monewden Road to reduce flood risk as per riparian landowner responsibilities.
- Ensure the completion of the existing highway drainage asset cyclic maintenance on Monewden Road.
- Investigate if the capacity and condition of the existing highway drainage assets on Monewden Road are sufficient.
- Maximise the take up of the £5k PFR Grant currently available to residents.

## 2. St. Peters Close

At the western end of Chapel Lane, internal flooding was experienced from the front of the properties from 8am onwards on 20 October. Properties were impacted by surface water run-off from the fields to the north. The intense rainfall resulted in large amounts of surface water flowing onto Chapel Lane. A field boundary ditch runs along the eastern side of the field and feeds into another ditch running parallel to the road. The field access intersects the ditch and enabled water to flow across the surface onto

Chapel Lane. Existing highway drainage assets at this location were unable to adequately drain the floodwater from the road. Some properties along this western end of Chapel Lane are situated lower than the road with downward sloping driveways creating a gradient for the floodwater to flow toward the houses. Similar flooding in this area had also taken place on 9 May 2023. On that occasion an intense localised rainfall event in Charsfield produced sporadic flooding across the village. The same source (overland surface water run-off) and pathway (across the ditch and on to the road) on Chapel Lane were observed.

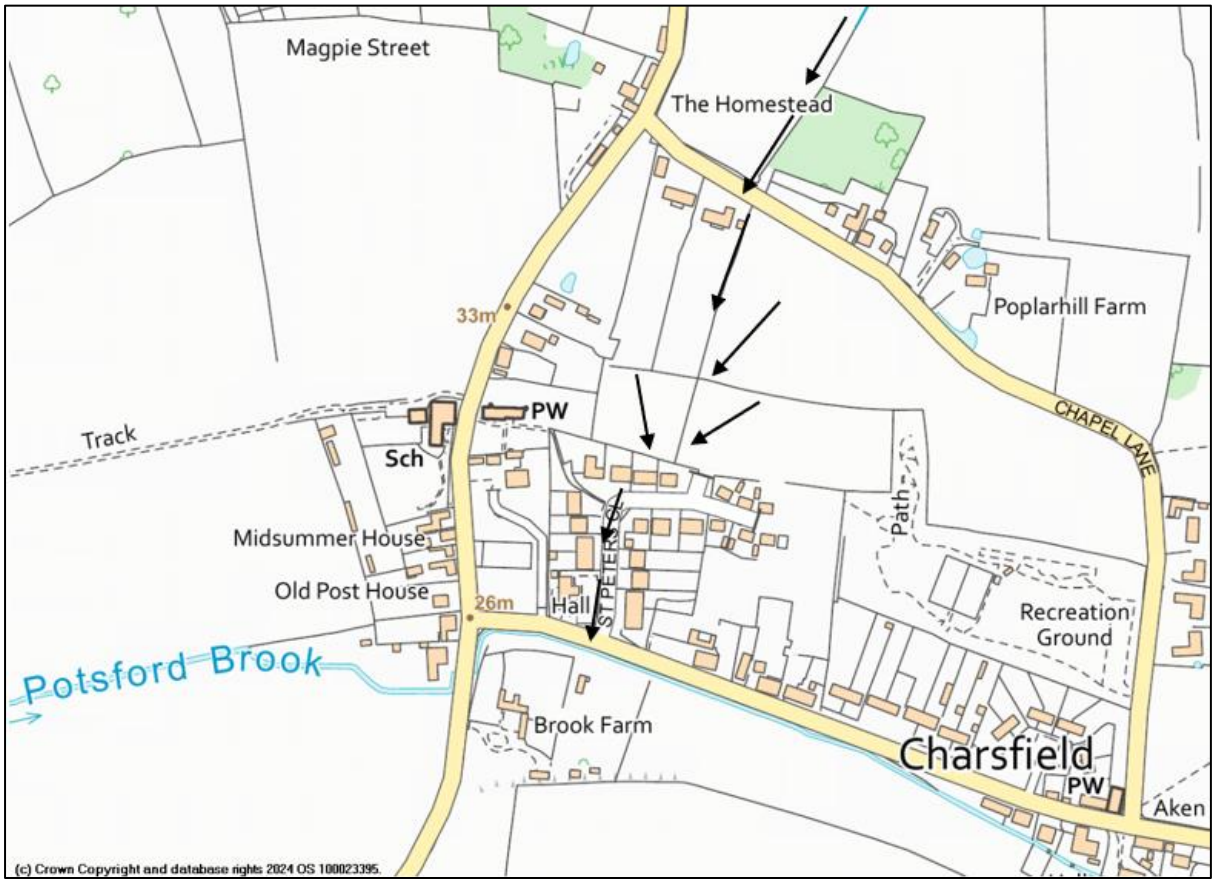


*Figure 12 - Approximate flood water flow routes towards and through St. Peters Close*

Residents reported that the floodwater flow path continued south of the western section of Chapel Lane across the fields towards St Peters Close (see Figure 12). Properties at the top of St Peters Close were impacted directly to the rear by the surface water coming down the ditch. The ditch feeds into a pipe which was unable to cope with the volume of water. The capacity of the ditch and pipe behind the houses were very quickly overwhelmed and overtopped, coming through and around the gardens and then flowing down the length of St Peters Close like a torrent. The flooding seen on St Peters Close during Storm Babet mirrored the previous flood event experienced earlier in the year on 9 May 2023. On that occasion an intense rainfall event produced localised flooding and was concluded to be from surface water run-off from the fields to the north.

Floodwater was accumulating at the bottom of St Peters Close from 7:00am onwards, making it one of the earliest sites of flooding in the village (Image 5). Internal flooding on St Peters Close was reported from 8:00am onwards with no sign of lessening until late afternoon. The observed floodwater flow path seen on Chapel Lane and St Peters Close is consistent with the predicted surface water flood risk which is defined as Medium to High in this location (see Figure 13).

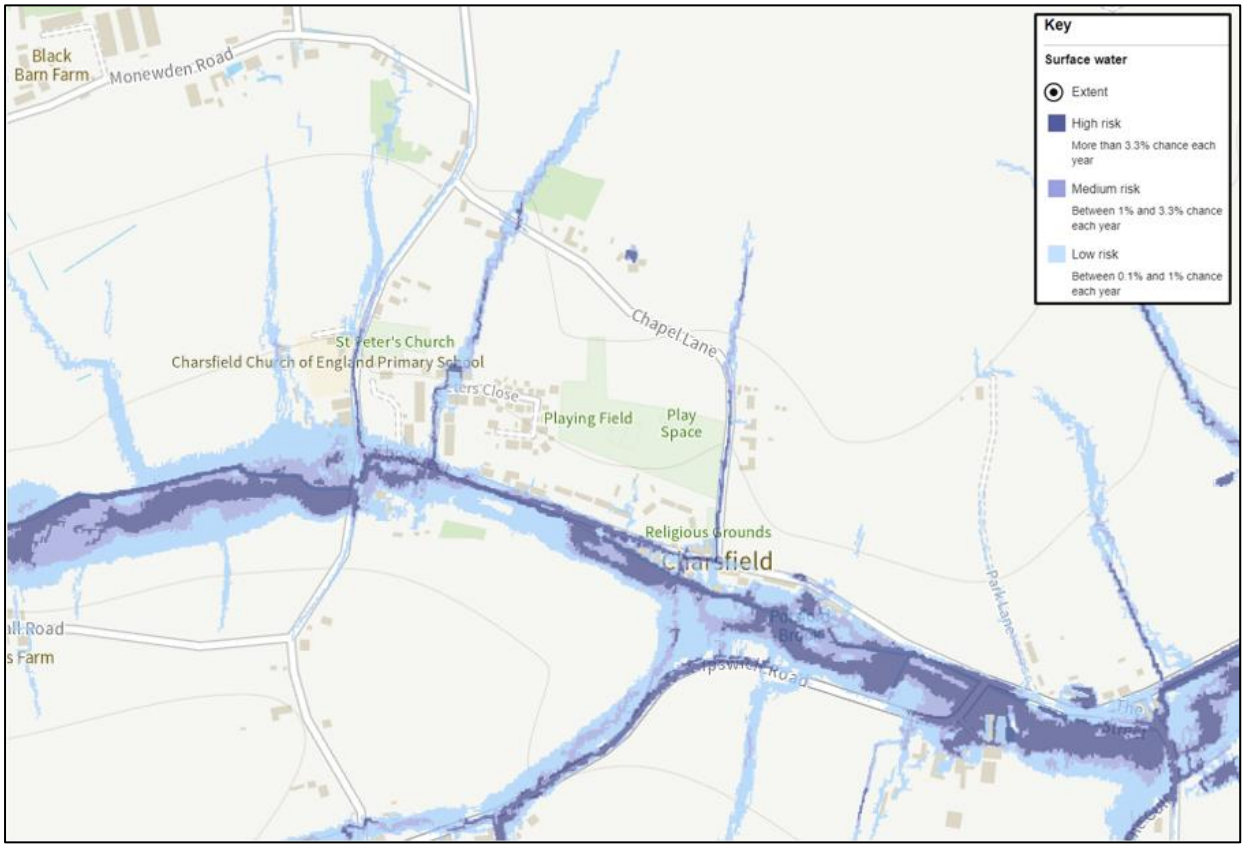


*Figure 13 - Predicted surface water flood risk for Charsfield*

In summary:

- High rainfall resulted in large amounts of surface water run-off coming from fields to the north of Chapel Lane and St Peters Close.
- Existing field ditches and the piped watercourse were overwhelmed when the floodwater exceeded their capacity.
- Floodwater followed the predicted flowpath along the downhill gradient and impacted properties from the front (Chapel Lane) and rear (St Peters Close).
- Drainage assets on the highway were overwhelmed as the floodwater accumulated at the bottom of St Peters Close and on The Street.

LLFA recommended action(s):

- Investigate potential Natural Flood Management (NFM) projects and funding opportunities which aim to attenuate water and 'slow the flow' in the upper catchment north of Charsfield, including the ditch north of St Peters Close.
- Investigate the options to extend the ditch or introduce tree planting or a hedgerow buffer zone along the north side of Chapel Lane.
- Ensure the completion of the existing highway drainage asset cyclic maintenance on St Peters Close and the western end of Chapel Lane.
- Investigate if the capacity and condition of the drainage assets at the western end of Chapel Lane and on St Peters Close are sufficient.
- Landowner to investigate if the capacity of the piped watercourse above St Peters Close can be increased.
- Maximise the take up of the £5k PFR Grant currently available to residents.

### 3. Church Road and Hall Road

Multiple properties were impacted by internal flooding on Church Road. The source of the flooding in this area was a combination of water overtopping from Potsford Brook, run-off from the fields west of Church Road and surface water flowing along Church Road from the north and south towards the junction with The Street (Image 1).

Initially surface water run-off flowed down from the fields to the north during the intensive heavy rainfall in the morning. The floodwater travelled behind and around the primary school merging with surface water flowing down the highway and continued to flow through the ditch network behind properties on Church Road, following the valley gradient towards Potsford Brook. Simultaneously there were large amounts of surface water coming off the fields to the south. Drainage of these fields has recently been improved, increasing the rate of flow coming into Potsford Brook (See Figure 14). This section of the Brook and adjacent fields were totally inundated with floodwater (Image 2).

With the amount of water flowing into the Brook from fields north, south and the catchment further west, its capacity was completely overwhelmed and floodwater spilled onto Church Road. Properties were internally flooded from 10am onwards. Residents reported flood debris, including straw from the fields, building up and snagging at the road bridge under Church Road. The capacity under the bridge simply could not cope with the volume of water, which backed up, flooding the highway and nearby gardens (Image 4). Suffolk Highways are aware of a number of pre-existing issues at this location which may have reduced capacity at the road bridge.

At this point Church Road was acting as a secondary river channel, carrying floodwater downstream, which overflowed into The Street. The Street is amongst the lowest points in Charsfield and acted as the central basin into which the floodwater was accumulating. The roadside drainage assets were completely overwhelmed. Outfalls for highway drainage were quickly submerged as they fell below the peak water level in the Brook and were unable to discharge fully into the Brook causing the water to back up further.

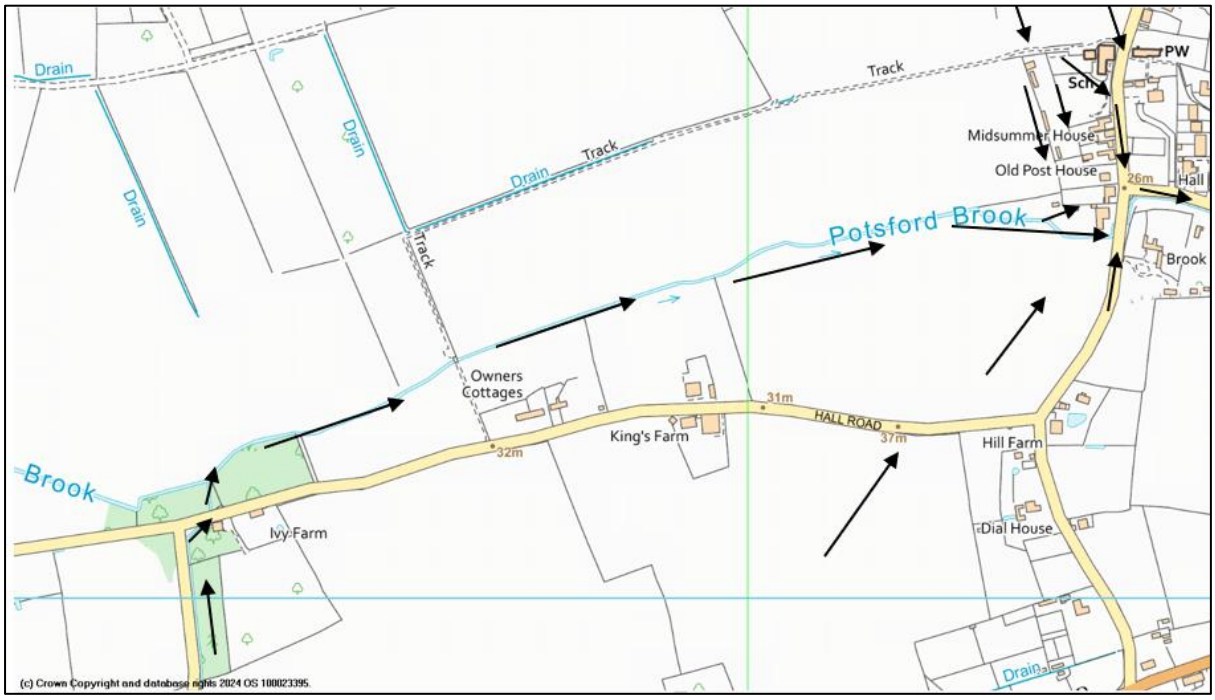


*Figure 14 - Approximate flood water flow routes on Church Road and Hall Road*

On Hall Road, internal flooding occurred when surface water off the fields to the south merged with floodwater on the road at some of the lowest points on the road. The small streams and drainage ditches overflowed with the large volumes of water coming down the slope of the fields. The internal flooding occurred in the morning of 20 October, around 10am and by the next afternoon the floodwater was reported to have dispersed.

In summary:

- High rainfall resulted in large amounts of surface water run-off coming from fields to the west of Church Road and along the highway from north and south.
- Potsford Brook was completely overwhelmed, the fields upstream of the road bridge were inundated with floodwater.
- Floodwater overtopped from the Brook at the road bridge as the capacity underneath was exceeded. Accumulated debris and pre-existing damaged Highways drainage infrastructure may have contributed to the problem.
- Drainage assets on the highways were overwhelmed.

LLFA recommended action(s):

- Investigate potential NFM projects and funding opportunities which aim to attenuate water and ‘slow the flow’ in the catchments to the west of Charsfield and on the flowpaths feeding into Potsford Brook upstream of Church Road.

- Any observed blockages at the road bridge on Church Road to be reported to Suffolk Highways.
- Ensure the completion of existing highway drainage asset maintenance on Church Road and Hall Road.
- Investigate the known Highways drainage issues at the road bridge on Church Road.
- Maximise the take up of the £5k PFR Grant currently available to residents.

## 4. The Street

Extensive flooding to residential and commercial buildings was reported on The Street. Properties reported internal flooding from 9am onwards with internal depths ranging from between 15 - 50cm. The flooding on The Street was caused by a combination of fluvial flooding from Potsford Brook overtopping its banks and pluvial flooding, with water flowing off fields and highways from the north and west.

The Street runs alongside Potsford Brook and as such, it is located along one of the lowest spots of the village. This meant that the majority of the flood water made its way onto The Street before flowing downstream of the village. Flood water originating from the fields to the west rapidly flowed down into the Potsford Brook watercourse, exceeding the capacity of the channel due to the sheer abundance of rainfall and surface water run off before overtopping the channel bank. The floodwater flowed across Church Road before merging with surface water flows coming down St Peters Close. Early on the morning of 20 October, from around 7am, The Street was described by residents as becoming ‘like a river’ (See image 9).

As mentioned above, pluvial flooding was a significant factor in the flooding experienced on The Street. Surface water flowed down onto The Street from Church Road, St Peters Close and Chapel Lane, all of which brought additional flood water. This sequence of events closely matches the flow paths and extents shown in the predicted surface water flood mapping (Figure 13).

There is a significant flow path identified along Chapel Lane, as outlined in Figure 13, with flood flows merging at the junction with The Street. There are a series of ‘grips’ to allow water to flow off the road and into the adjacent watercourse. These have become silted up and are last recorded to have been formally inspected in 2019. Whilst there is a minor watercourse running parallel to Chapel Lane, floodwater mainly flowed down the highway, which is relatively steep, collecting in large volumes at the southern end of Chapel Lane where it meets The Street (Image 3). At this point the watercourse is piped for a short section before out falling into Potsford Brook. However, as the pipe is relatively small (approx. 300mm in diameter) and most of the floodwater was within the highway rather than the upstream watercourse, this indicates the pipe could not accommodate the flow. The piped section has less capacity than the original open channel and has likely reduced the volume of water that could be safely conveyed from the bottom of Chapel Lane into Potsford Brook during a storm event.

Further along The Street, some residents suffered additional flooding to the rear of their properties as the water level in the Brook continued to rise and eventually overtop into gardens and houses from behind. There was a time lag between the initial onset of surface water to the front and water levels in Brook exceeding capacity. Fluvial floodwater rapidly filled the rear gardens. The properties were caught in the middle, surrounded by flood water from both sides. Consequently, as the drainage assets on the highway were overwhelmed, the flood water on the road could not discharge into the river, creating a large expanse of water around the properties.

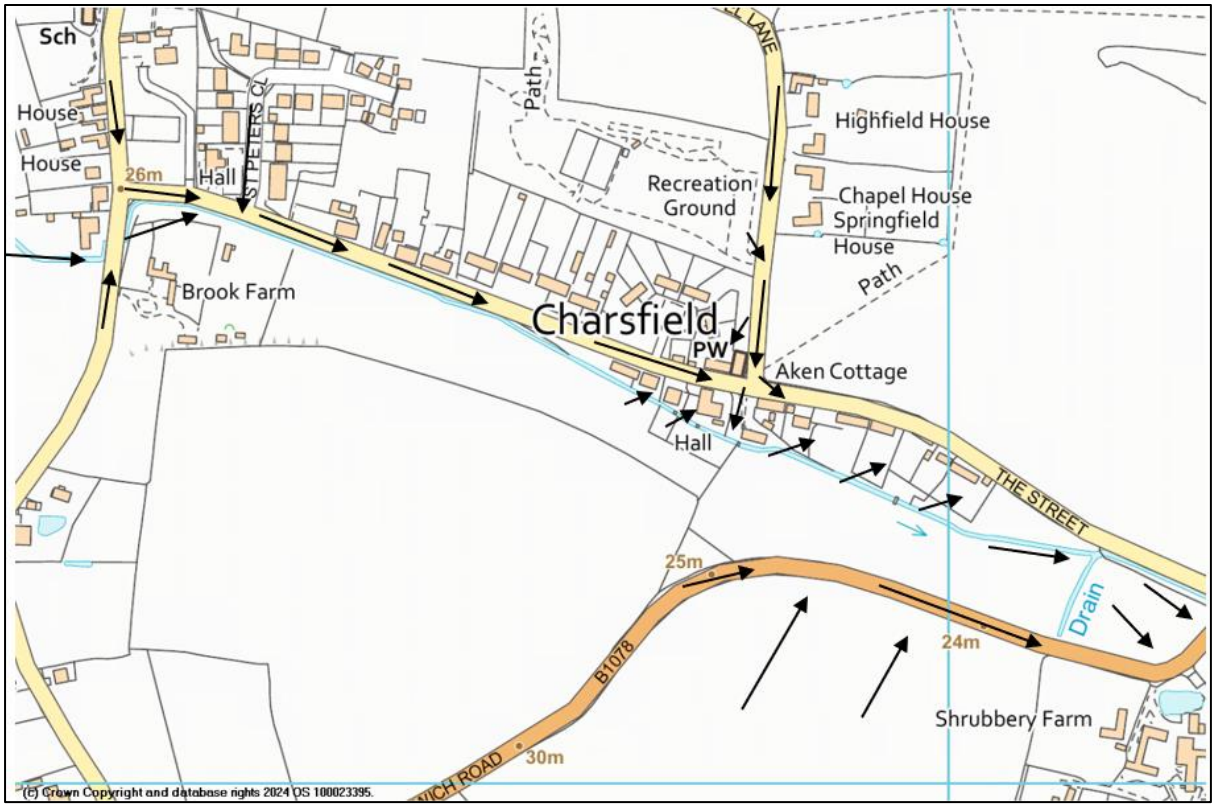


*Figure 15 - Approximate flood water flow routes on The Street*

Similar internal flooding had occurred previously at this location in May 2023. During that event, the floodwaters flowed down Chapel Lane and accumulated on The Street to a depth where it breached property thresholds. The majority of the properties located near the junction of Chapel Lane and The Street experienced water ingress into the ground floors.

Suffolk Highways are aware of pre-existing drainage issues at the junction of Chapel Lane and The Street. Highways records show instances of water surcharging from inspection chambers and water frequently pooling on the road surface. Further investigation is needed to fully understand the causes and likely solution to the problems.

In summary:

- High rainfall resulted in large amounts of surface water run-off coming from fields to the west pouring into Potsford Brook.
- Potsford Brook was completely overwhelmed, coming out of bank at Church Road, with floodwater flowing down The Street across the width of the road.
- Surface water flows coming down St Peters Close and Chapel Lane added to the extensive floodwater accumulating along The Street.
- Floodwater overtopped from the Brook, impacting properties and gardens from the rear. A number of houses were surrounded by floodwater.
- Drainage assets on the highway were overwhelmed.

LLFA recommended action(s):

- Investigate potential NFM projects and funding opportunities which aim to attenuate water and 'slow the flow' in the catchments to the west and north of Charsfield, targeting the flowpaths that feed into Potsford Brook.
- Any observed blockages within the main river section of Potsford Brook to be reported to the EA.
- Ensure the completion of existing highway drainage asset maintenance on Chapel Lane and The Street.
- Re-cut the grips on Chapel Lane
- Investigate the known Highways drainage issues at the junction of Chapel Lane and The Street.
- Maximise the take up of the £5k PFR Grant currently available to residents.

## 5. Wickham Market Road

On the east side of Charsfield, a number of properties on the Wickham Market road were impacted by internal flooding. Large amounts of floodwater were reported to be flowing along the road surface from the junction of the B1078 and The Street (Image 8). The floodwater on the B1078 originated as run-off from the fields to the south. There was also fluvial flooding from the Potsford Brook as the water levels rose out of bank, water in the channel backed up at the road bridge as it was partially blocked and silted up on the upstream side. It then merged with the expanse of floodwater on the road with additional flows coming from the fields to the north down Park Lane.

The properties were flooded to the front from the road. The flooding in this area is reported to have occurred between 11am and 1pm, slightly later than other parts of the village presumably indicating the time taken for the peak flow to travel through the village from the west.

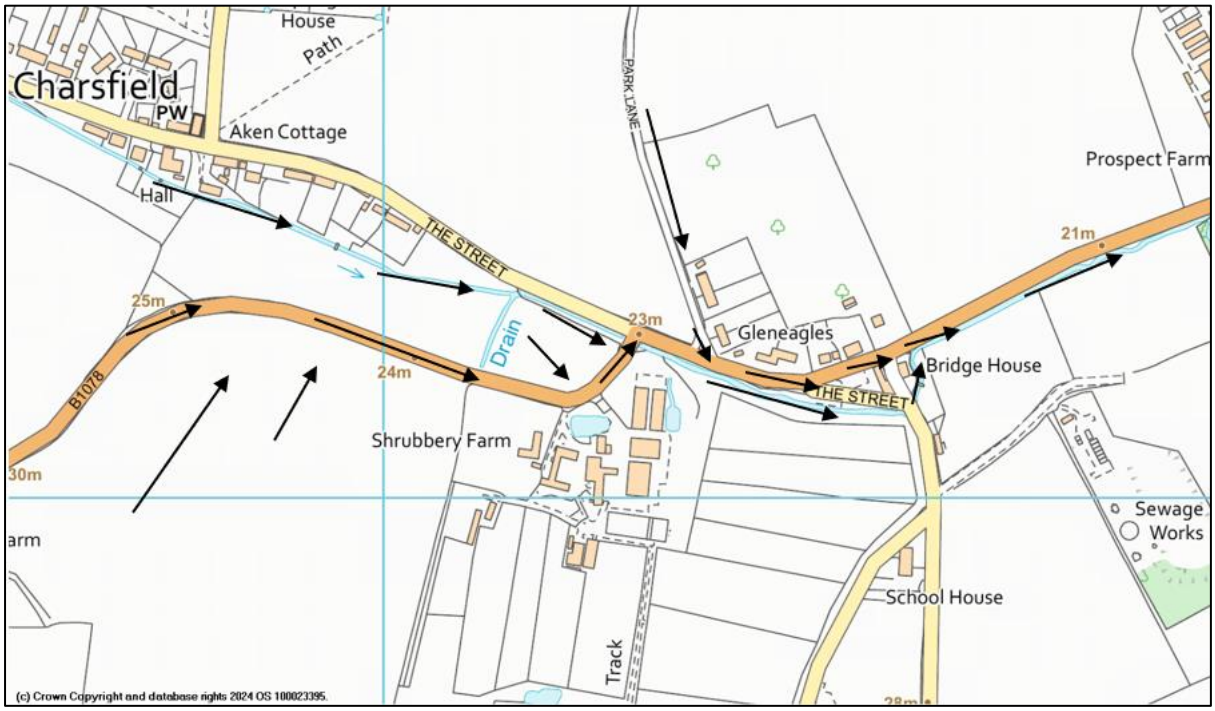


*Figure 16 - Approximate flood water flow routes on Wickham Market Road*

In summary:

- High rainfall resulted in large amounts of pluvial flows coming from the fields south of the B1078, Park Lane and along The Street.
- The Potsford Brook backed up and overtopped around the B1078 road bridge. A build-up of silt and debris on the upstream side of the bridge may have contributed to a loss of capacity in the channel.
- The fluvial flows merged with the large volumes of floodwater across the highway.
- Drainage assets on the highway were overwhelmed.
- Flood water flowed along the road impacting properties from the front.

LLFA recommended action(s):

- Investigate potential NFM projects and funding opportunities which aim to attenuate water and 'slow the flow' in the fields south of the B1078, and north of Park Lane.
- Any observed blockages within the main river section of Potsford Brook to be reported to the EA.
- Any observed blockages at the B1078 road bridge to be reported to Suffolk Highways.
- Ensure the completion of highway drainage asset maintenance on along the B1078 and The Street.
- Maximise the take up of the £5k PFR Grant currently available to residents.

## 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 - Church Road junction looking toward The Street*

*Image 2 - Looking upstream of Church Road bridge*

*Image 3 - View from Chapel Lane toward The Street*

*Image 4 - Flooding on Church Road bridge*

*Image 5 - Looking south on St Peters Close toward The Street*

*Image 6 - View over Longmeadow showing Potsford Brook and possible former river channel*

*Image 7 - Flooding on Hall Road*

*Image 8 - View from The Street looking towards Wickham Market Road*

*Image 9 - Flooding on The Street*

# 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 Charsfield 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 group may be active within the community.

| **Risk Management Authority** | **Relevant Flood Risk Function(s)** |
|---|---|
| Suffolk County Council (SCC) | Lead Local Flood Authority (LLFA), Highways Authority & Asset Owner |
| Environment Agency (EA) | Lead organisation for providing flood risk management under its permissive powers and issuing warnings of flooding from main river |
| East Suffolk District Council (ESDC) | Local Planning Authority & 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 |
| Parish Council | Manage flood risk at a community level, prepare and produce emergency 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 | Responsible Party | Progress |
|---|---|---|
| Reactive clearance works of the debris at the upstream end of the B1078 road bridge. Clearance was undertaken on 01/05/24 | Suffolk County Council Highways Authority | Complete |
| Investigation into the benefit of in-channel river maintenance through Charsfield. | The Environment Agency | Environment Agency have visited site to assess requirement for maintenance. A bid for funding will be submitted for future intermittent maintenance on main river in Charsfield. |
| The EA have initiated a long-term programme to better map the flooding extents of the river Deben & tributaries. | The Environment Agency | Hydraulic modelling to start in 2025 and will take two years |
| On 23 January 2024 EA representatives from Hydrometry and Telemetry and Flood Resilience teams at the request of the Charsfield Flood Group, visited three sites along the Potsford Brook identified by the Flood Group, to assess whether EA instrumentation could be installed to measure water level. The three sites identified by the Flood Group were:<br>1. TM2538656393<br>2. TM2584756246<br>3. TM2619556132 and TM2621056125 | The Environment Agency | The site visit notes and conclusions were shared with the flood group on 22/2/24.<br>The conclusions were:<br>A) These three sites do not meet Environment Agency requirements to install any water level monitoring instrumentation, although there |

| | | |
|---|---|---|
| | | are potentially options for the community to gain the permissions required and to install some instrumentation.<br>B) The community could further explore options upstream of Charsfield for water level/flow monitoring. Given the contribution of surface water, pluvial and overland flows, a reliance on in-channel gauged telemetry alone upstream of Charsfield is unlikely to provide a complete situational awareness.<br>C) The purpose of the data needs to be clarified as to whether it is to provide background information or to trigger a parish emergency flood plan. |
| 1. Gathered information and prepared for Section 19 investigation.<br>2. Liaised with Deben Catchment landowners | Charsfield Parish Council | |

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| gathering information about insurance claims. | | |

## 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 Charsfield. They have been derived from evidence collected during the investigation and included having been considered relevant and realistic to implement. The implementation of actions falls to the relevant responsible party. Progress on the action will be monitored by Suffolk County Council and updates published, but it should be acknowledged that the Council does not have 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 | Charsfield Parish Council | 6 - 12 months | The EA can support the Parish Council and JEPU in their reviews and updates to the Emergency Plan |
| Maximise the take up of the £5k PFR Grant currently available to residents before the April 2025 deadline | SCC LLFA/ Residents | 6 months | |
| Understand the annual event probability of the Storm Babet rainfall & river flow across the region and specifically Charsfield | EA | 6 months | Ongoing |
| Report any observed blockages in the ordinary watercourse or main river section of Potsford Brook to be removed by the relevant authority or riparian landowner. | Landowners / EA | N/A | Ongoing |
| Ensure riparian landowner responsibilities are understood with regard to watercourse management | EA /SCC LLFA / Residents | 6 months | Ongoing |
| Report any observed blockages below the road | SCC Highways Authority | N/A | Ongoing |

| | | | |
|---|---|---|---|
| bridges at Church Road and the B1078 via the online Highways Reporting Tool | | | |
| Ensure the completion of highway drainage asset cyclic maintenance in Charsfield. Key areas include Chapel Lane, Church Road, St Peters Close & The Street. | SCC Highways Authority | Annually | Ongoing |
| Clear out and re-cut the grips on Chapel Lane | SCC Highways Authority | 6 - 12 months | |
| **Medium Term Actions** (e.g. longer planning timescales and potential need to source funding but potential for greater impact) | | | |
| Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths north, south and west of Charsfield. E.g. leaky dams, restoration of watercourses | SCC LLFA, EA, landowners | 12 - 24 months | |
| Investigate the potential options to provide reduced field run-off at western end of Chapel Lane | SCC LLFA with Landowners | 12 - 24 months | |
| Investigate highway drainage infrastructure to ensure capacity and condition are sufficient in worst affected areas. Key areas include Chapel Lane, Church Road, St Peters Close & The Street. | SCC Highways Authority | 12 - 24 months | |
| Landowner to investigate if the capacity of the piped watercourse above St Peters Close can be increased. | Landowner, SCC LLFA | 12 - 24 months | |
| 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+ | |

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|---|---|---|---|
| Improved understanding and modelling of fluvial and pluvial flooding within the village to inform bids for any future potential capital works. | SCC/EA | 2027 | Work to start on updating the River Deben (Main River) hydraulic modelling in 2025. |
| Investigate the options available for an upstream river level gauge for Charsfield, managed by the community. Similar communities may already have schemes in place to learn from | Charsfield Parish Council, CFAG | N/A | |
| Investigate potential viability and seek funding for projects which aim to attenuate water in the upper catchments e.g., upstream attenuation, storage ponds, wetland areas. | SCC LLFA, EA, Landowners | 12 - 24 months | |
| **Long Term actions** (significantly longer timescale and budget required with potentially greater positive impact) | | | |
| Improvements to highway drainage network to manage surface water flows if investigation works suggest it is 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. | SCC LLFA, EA and landowners | TBC | |
| Deliver any capital interventions that are economically, technically and environmentally feasible and acceptable to improve the flood resilience of the village. | SCC LLFA, EA and landowners | 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.

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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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