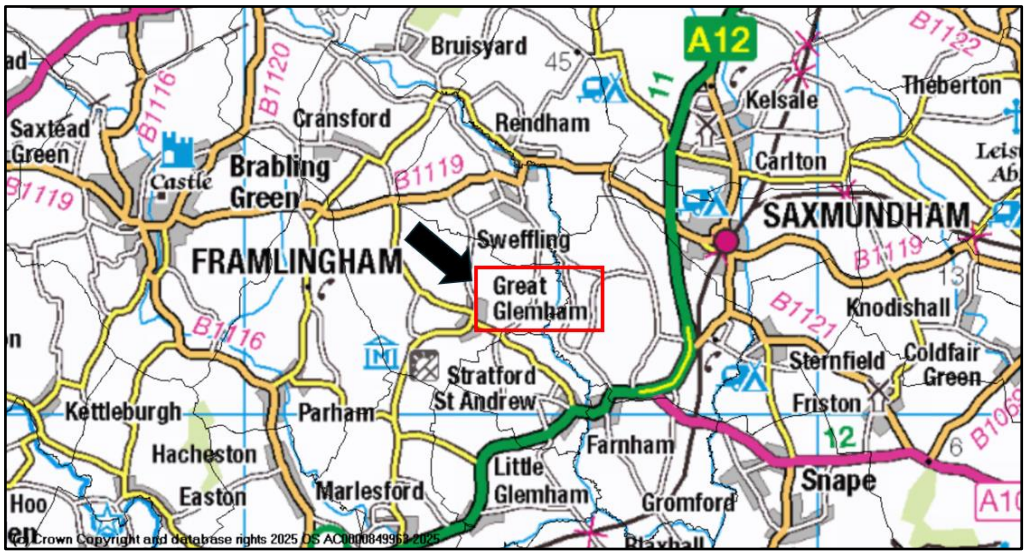
Section 19 Flood and Water Management Act 2010

Great Glemham 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. Great Glemham was a community that was significantly impacted, with approximately eight 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.

Great Glemham is located in an area at significant risk of both fluvial and pluvial flooding and the nature of the surrounding topography and geology contributes to the susceptibility of the community to flooding. Areas of Great Glemham are low-lying, with low gradients in the centre of the village, surrounded by steeper valleys. The local geology and soils in most of the catchment upstream of the village of Great Glemham and the catchment surrounding Parham Airfield are susceptible to high run off, making a high number of properties in the village vulnerable to flooding due to intense rainfall events.

Storm Babet delivered significant rainfall to the catchments, following an extended period of above average rainfall. Impacts within Great Glemham parish were widespread and for the purposes of this report, the affected areas have been categorised into four 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 Great Glemham was severely impacted by flooding due to the intensity and duration of rainfall which overwhelmed the natural flow routes and the capacity of watercourses and drainage infrastructure. This situation was compounded when overland flow paths converged and saw the resultant internal flooding of property.

Short, medium and longer term recommendations have been published and each have a potential role to improve resilience and reduce the risk of flooding to Great Glemham. For short term measures, key highlights include the implementation of a community flood plan and maximising Property Flood Resilience (PFR) measures. For medium to longer term recommendations, there is emphasis on the management of water from rural land though 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 Meteorological Office weather data (Met Office, 1991- 2020). This significant rainfall in a short space of time resulted in saturated land and rivers reaching their capacity. Shortly after this, Storm Babet followed on the 18th to 21st of October 2023. The storm brought between 50 mm and 80 mm of rain to much of central and northern East Anglia, with some Suffolk weather stations recording the wettest October day on record.

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

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

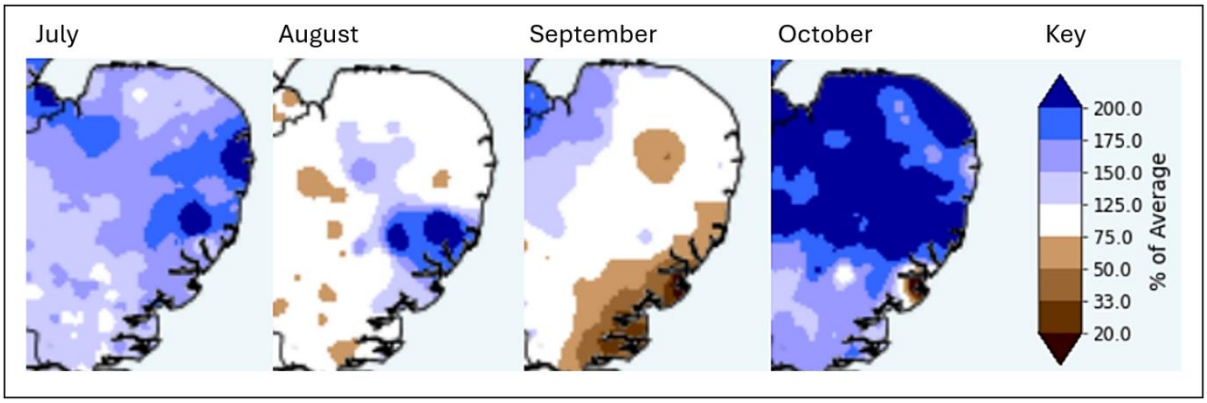

Fig. 1. Average monthly rainfall (July – October 2023) as a percentage of the historic average monthly rainfall

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

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

2. Location of flooding

The village of Great Glemham is located in the district of East Suffolk Council, approximately three and a half miles east of the town of Framlingham and two and a half miles west of Saxmundham (Fig. 2).

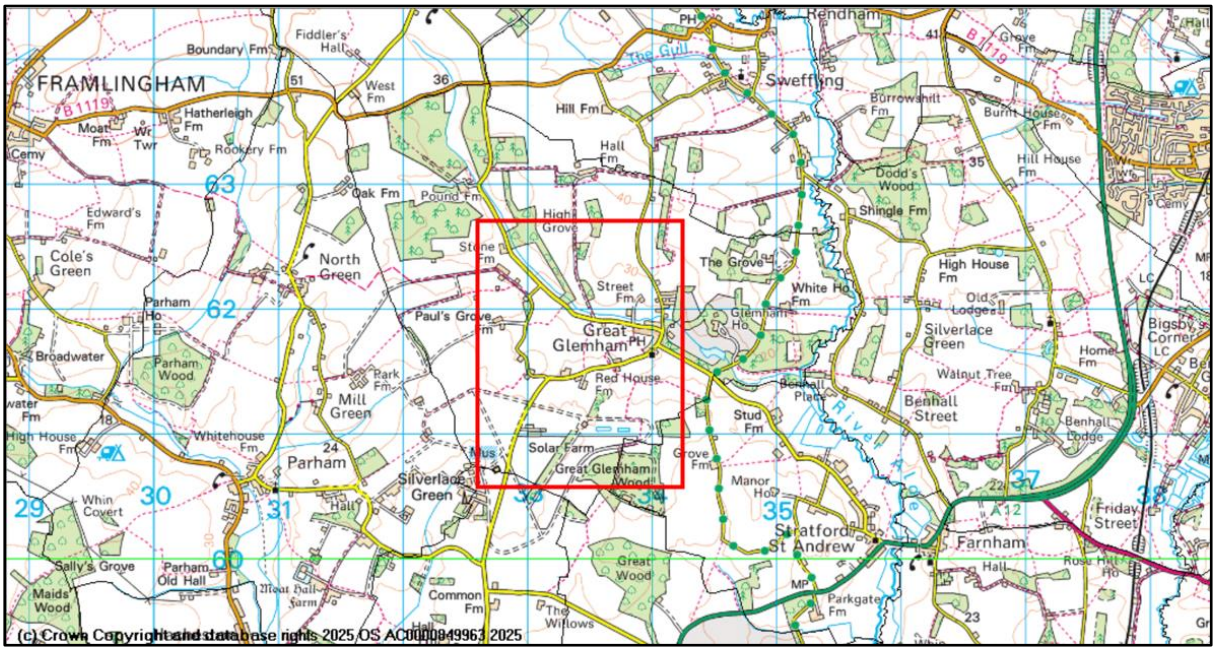

Fig. 2. Investigation area map

Fig. 3 shows the most significant watercourses in and around Great Glemham. It includes a statutory main river and a tributary of the River Alde which converge downstream, approximately three quarters of a mile east of the village of Great Glemham.

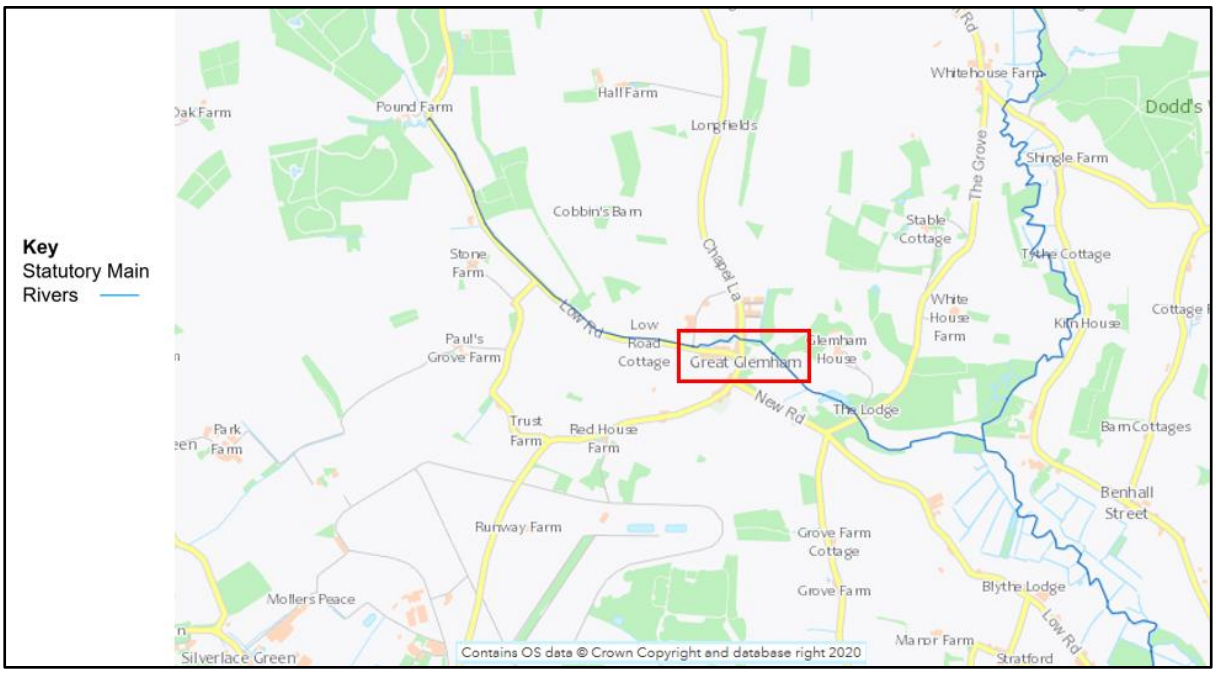

Fig. 3. Location of statutory main rivers and significant ordinary watercourses (Environment Agency)

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

On the 20th October 2023, Storm Babet resulted in significant rainfall across Suffolk on already saturated ground due to above average rainfall in the preceding weeks. Great Glemham was significantly impacted with approximately eight properties reporting internal flooding. Flood water was described as coming from several sources including surface water runoff from surrounding fields (pluvial), the overtopping of local watercourses (fluvial) and overwhelmed drainage systems. Within this report, the term 'flood water' may be used to describe all types of flooding.

For the purposes of this investigation the various areas affected by flooding have been separated into four distinct zones:

1. Low Road (east) and Chapel Lane
2. Low Road (west)
3. Workhouse Lane
4. Parham Airfield

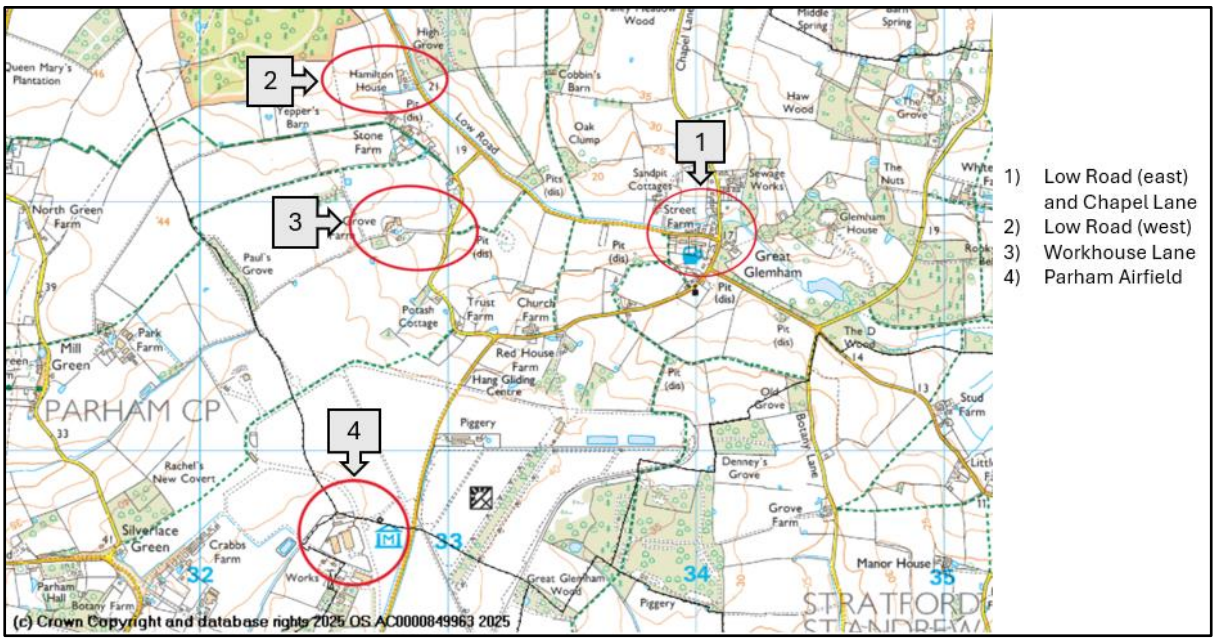

Fig. 4. Distinct flood zones

3. Records of any historical flooding

A review of Suffolk County Council's Highways reporting tool, local and social media reports did not indicate previous incidents of internal flooding of property in Great Glemham.

4. Predicted Flood Risk

Affected property on Low Road (east) and Chapel Lane in Great Glemham village is projected to be at no risk of surface water flooding with the exception of one property on Chapel Lane which is projected to be at low risk. It should be noted that low risk of flooding indicates a flood risk during extreme events, such as Storm Babet. Affected property in the three outlying zones is projected to be at high risk of surface water flooding.

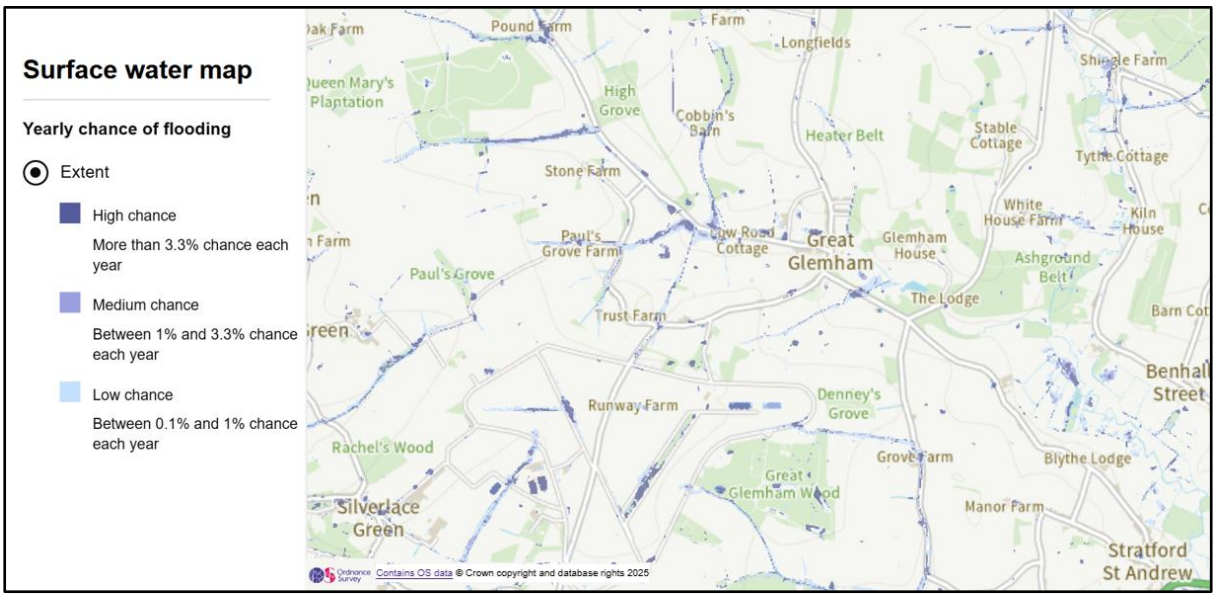

Fig. 5. Predicted flood risk from surface water

Fluvial flood risk on Low Road (east) and Chapel Lane in Great Glemham village is associated with the tributary to the River Alde. Affected property in this area was mostly at low and medium risk, although one was at high risk. Affected property in the outlying zones was not projected to be at fluvial flood risk.

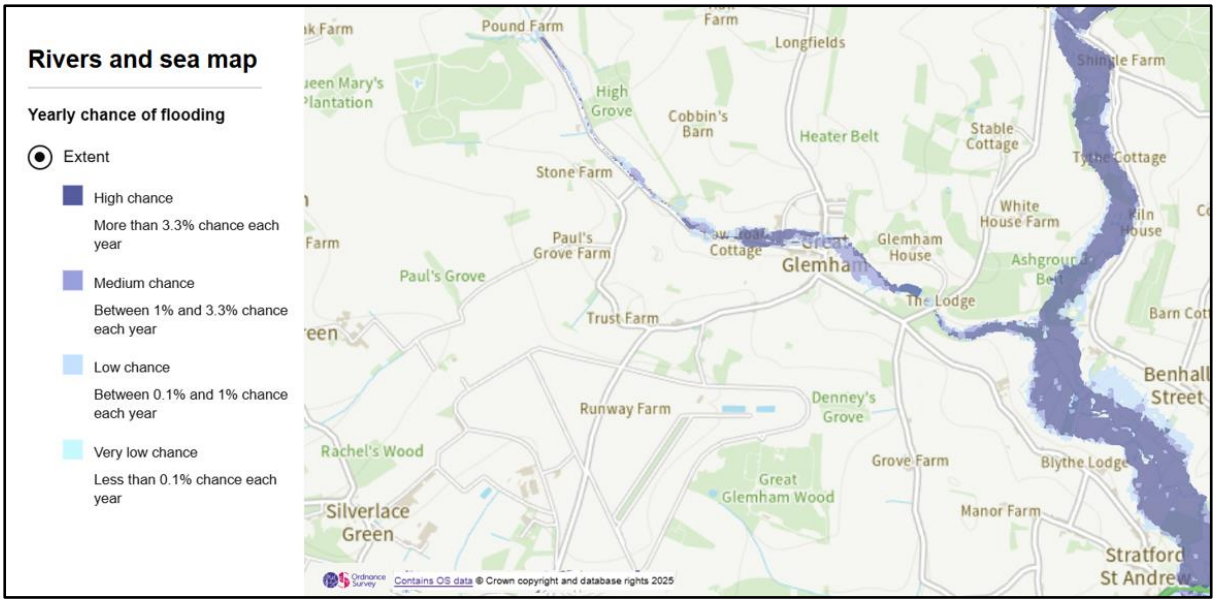

Fig. 6. Predicted flood risk from rivers

5. Catchment characteristics

The village of Great Glemham is situated in the valley of a tributary which joins the River Alde to the east of the village. The two western outlying flooded zones on Low Road and Workhouse Lane both lie in surface water flow paths which contribute to this tributary. The former Parham Airfield lies on an elevated plateau to the southwest of

the village at the top of a different catchment which flows to the southwest. Farmland is used primarily for arable agriculture and grassland pasture.

The low-lying nature of the village means that during high rainfall events considerable flows of water converge towards Great Glemham (see Fig. 7). Overwhelmed infrastructure and watercourses may be observed during these intense rainfall events.

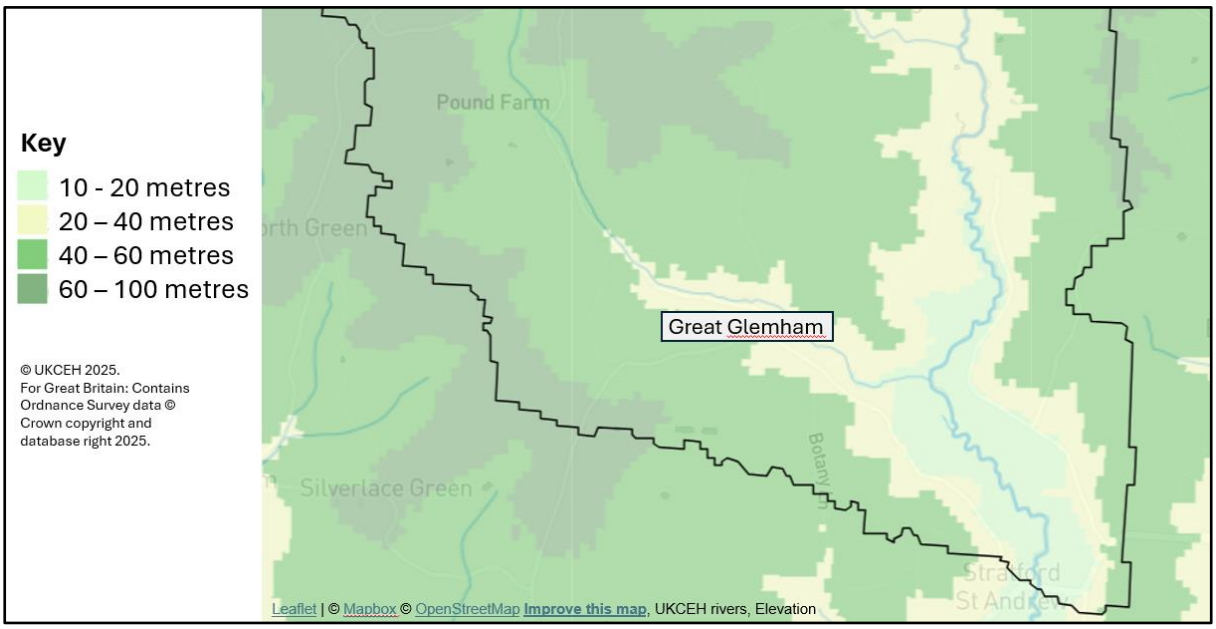

Fig. 7. Elevation map of catchment area showing 35003 Alde at Farnham gauging station catchment boundary (National River Flow Archive)

The soils in the wider catchment surrounding Great Glemham and the catchment around Parham Airfield are loamy and clayey with impeded drainage, meaning that water permeates more slowly and surface water runoff is greater, particularly during intense rainfall (Fig. 8). However, the saturated nature of the soils leading up to the event would also have prevented some infiltration.

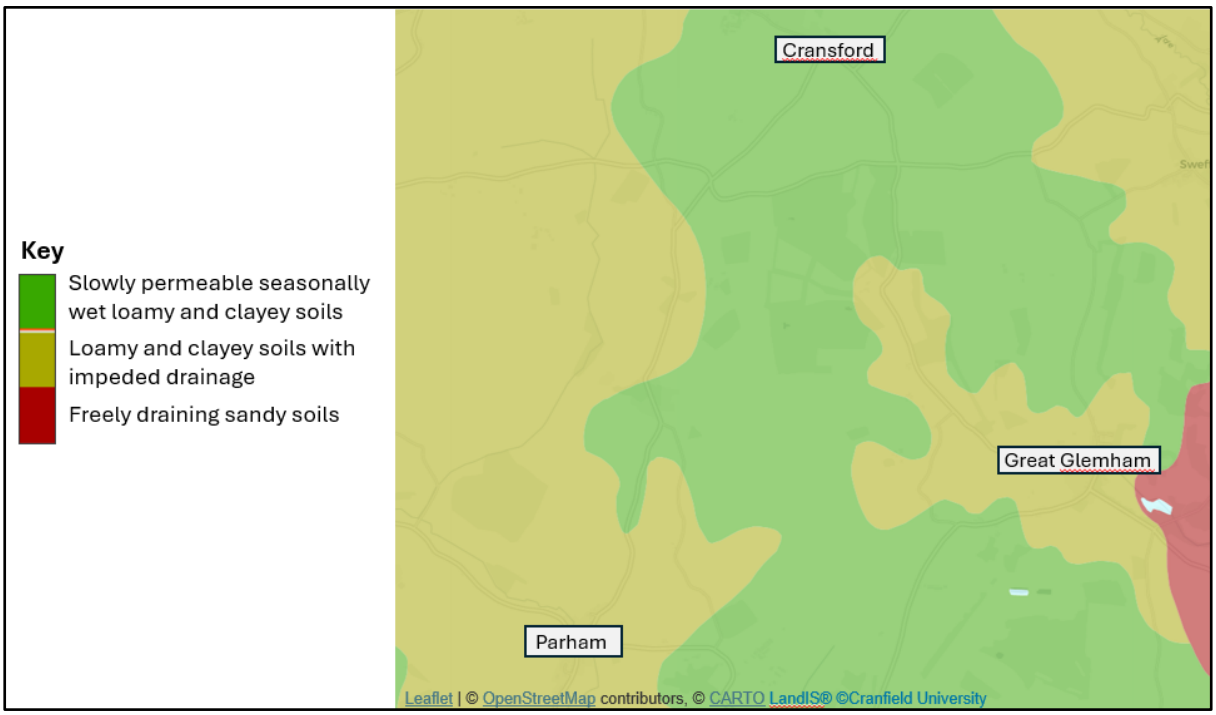

Fig. 8. Soil map of catchment area (LandIS Soilscapes)

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

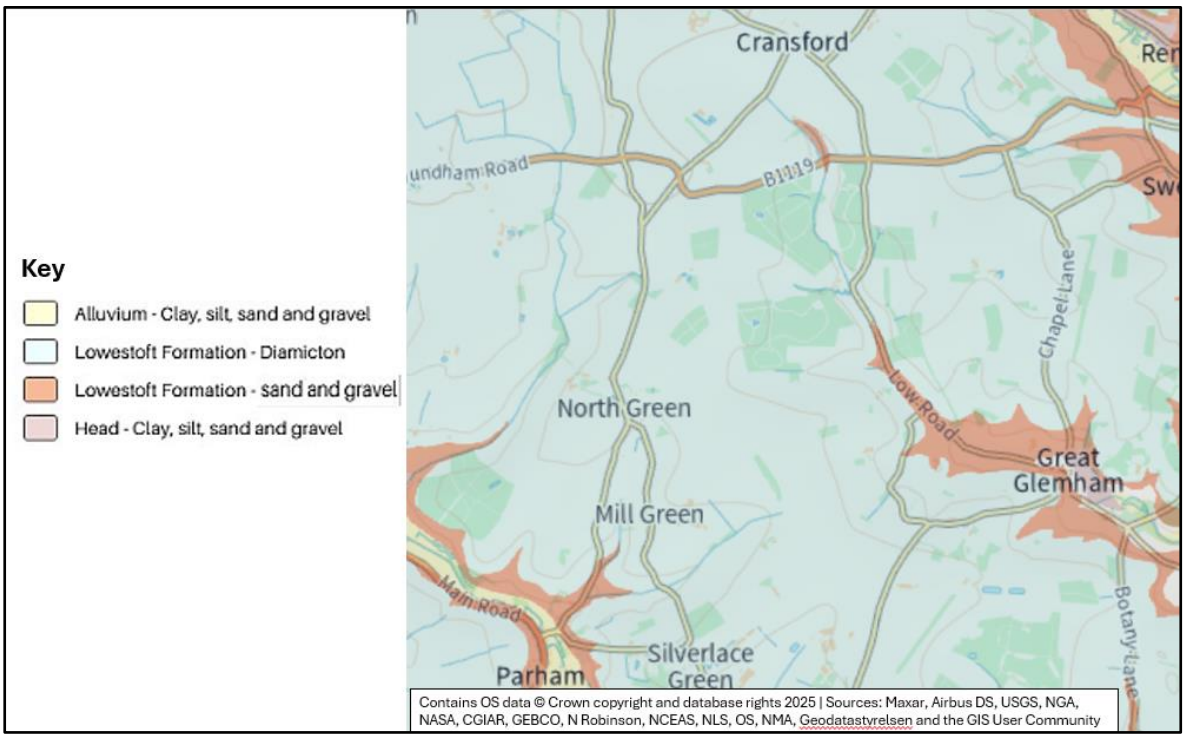

Fig. 9. Superficial geology in catchment area (British Geological Society)

The bedrock in Great Glemham and in the surrounding upstream area of the catchment consists of Crag Group - sand. However, during short term intense rainfall events, soil composition and superficial geology become more influential in affecting the volume of surface water runoff. Combined with the topography within the catchment, these make Great Glemham susceptible to extreme rainfall events. Saturated ground and high rainfall, like that of Storm Babet, will further emphasise the vulnerability of the parish and localised flooding could be experienced.

Flooding Sources, Pathways & Receptors

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

Data from surrounding Environment Agency rain gauges indicates that a significant volume of rain was experienced during Storm Babet. The nearest rainfall gauge to Great Glemham is Benhall, which recorded almost its entire rainfall for 20th October 2023 between 1.15am and 16.15pm at 48.2mm. 16.8mm of this was received between 9:45am and 11:15am.

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.

However, Great Glemham is not within an area covered by the Environment Agency's Flood Warning Service and as such, it is not possible to provide advanced notice of imminent flooding in this area.

The description of the flood events described below will discuss the probable sources of flooding, the observed flow paths through the community and the receptors which have been affected. The term 'floodwater' may be used to describe both fluvial (water from a watercourse) and pluvial (surface water run-off) flooding. This section has been prepared using reports submitted to Suffolk County Council via the online Highways Reporting Tool, community data and site visits.

Detailed descriptions of each investigation area can be found below.

1. Low Road (east) and Chapel Lane

The easternmost area where property was affected by internal flooding was in Great Glemham village, on Low Road and Chapel Lane. At least five properties are known to have flooded internally in this area. Affected property here was projected to be at no risk of surface water flooding with the exception of one property on Chapel Lane which is projected to be at low risk. Fluvial flood risk for impacted property was projected to be mostly at low and medium risk, although one affected property on Low Road was at high risk.

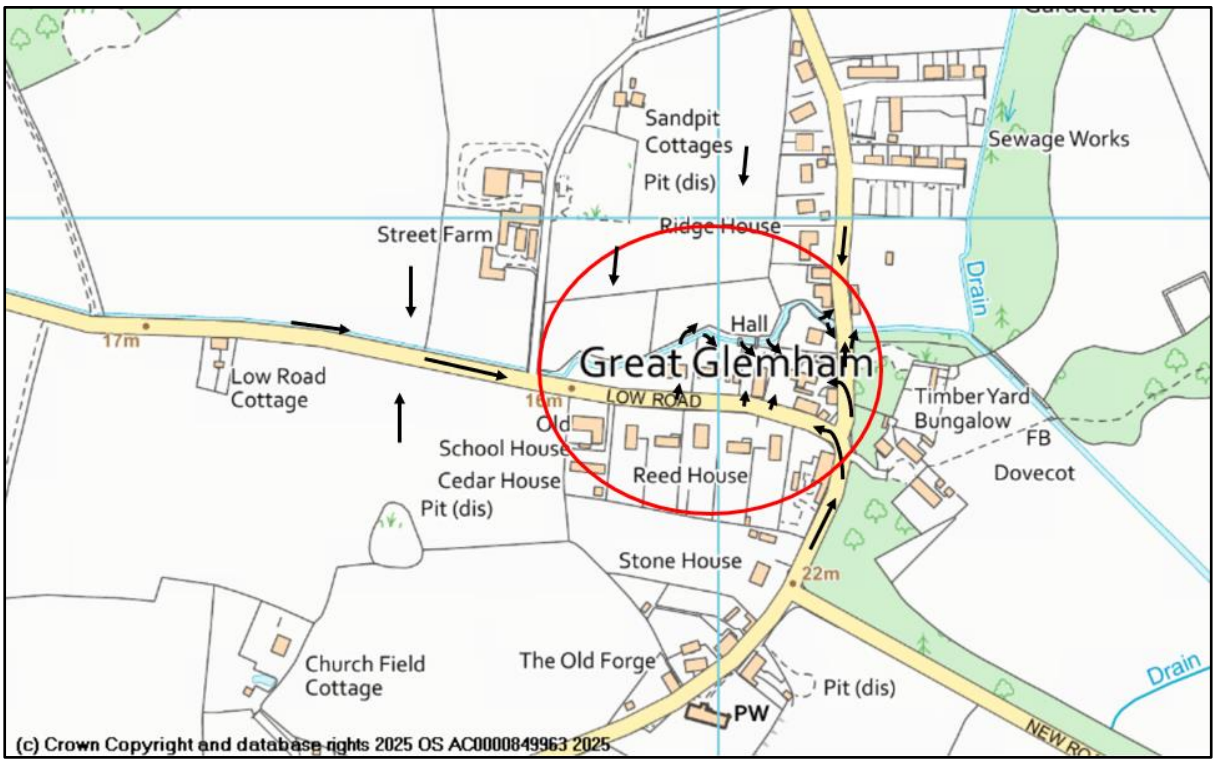

Fig. 10. Approximate floodwater flow paths, Low Road (east) and Chapel Lane

On the west side of Great Glemham village, significant rainfall caused large quantities of surface water to flow across fields towards Low Road and the adjacent watercourse (tributary to the Rive Alde) from both sides. Flood water was also reported to have flowed east down Low Road and collected at a low point on the highway, close to the junction with Chapel Lane. Surface water was also reported to have flowed down Chapel Lane from the south which then flowed into Low Road at the junction, as well as continuing to flow north on Chapel Lane towards the bridge over the tributary. On the north side of the bridge, surface water also flowed south down Chapel Lane towards the bridge. Floodwater flowed down driveways which were at a lower level than the highways in Low Road and Chapel Lane. Highway drainage was reported to be blocked in Low Road in the vicinity of affected property. Flooding of the highway and pavement is reported to occur repeatedly here. (SCC Highways has increased the frequency of the maintenance cycle from biennial to annual since Storm Babet). However, in the extreme rainfall conditions, the capacity of the wider drainage system, even if fully functioning, would have been limited.

The watercourse overflowed at the rear of property on Low Road and Chapel Lane, contributing significantly to floodwater in the vicinity. The road bridge over the watercourse on Chapel Lane acted as an additional pinch point. Some silt deposits were subsequently observed under the bridge, which has a solid base (invert). However, in high flow events, small accumulations of silt are likely to be washed away, particularly where there is a hard invert and no vegetation growth. The bridge was inspected in December 2023 – silt accumulation was observed to be very minor at that time and no silt clearance was considered necessary. (The next inspection is

programmed for September 2025, access permitting). It was reported that the lowest point on Chapel Lane became impassable on 19th October, 2023. Property in Chapel Lane reported internal flooding by midday on 20th October and internal property floodwater levels in Chapel Lane are reported to have reached approximately 1m. In Low Road, internal property floodwater levels were reported to have reached 50cm.

In summary:

- Intense and prolonged rainfall exceeded the capacity of field drains west of Great Glemham village and surface water flowed across fields on the north and south sides of Low Road towards Low Road and the adjacent watercourse.
- Surface water flowed west along Low Road from the junction with Chapel Lane and east along Low Road from the west side of the village. This collected at a low point in the centre of the village.
- Floodwater flowed down lower level driveways relative to the highways.
- Surface water flowed down Chapel Lane from the north and south sides towards the bridge.
- The watercourse overtopped in the village, contributing to flooding on Low Road and Chapel Lane.
- Highway drainage was reported to be blocked in Low Road.
- The road bridge over the watercourse in Chapel Lane was an additional constriction to flow.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) measures.
- Suffolk Highways to investigate highway drainage assets in Low Road in the vicinity of reported blockages.
- Suffolk Highways to continue to monitor silt deposits below the road bridge on Chapel Lane over the watercourse during biennial bridge inspections.
- Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to “slow the flow” and attenuate water in the upper catchment of Great Glemham village on the surface water flow paths and ditches.

2. Low Road (west) and 3. Workhouse Lane

One property on Low Road (west), was reported to have flooded internally, attributed to surface water runoff from fields.

One property on Workhouse Lane was also reported to have flooded internally to a depth of approximately 10cm, attributed to surface water runoff from fields and ditches overtopping.

The above properties in both locations were projected to be at high surface water flood risk and no fluvial flood risk.

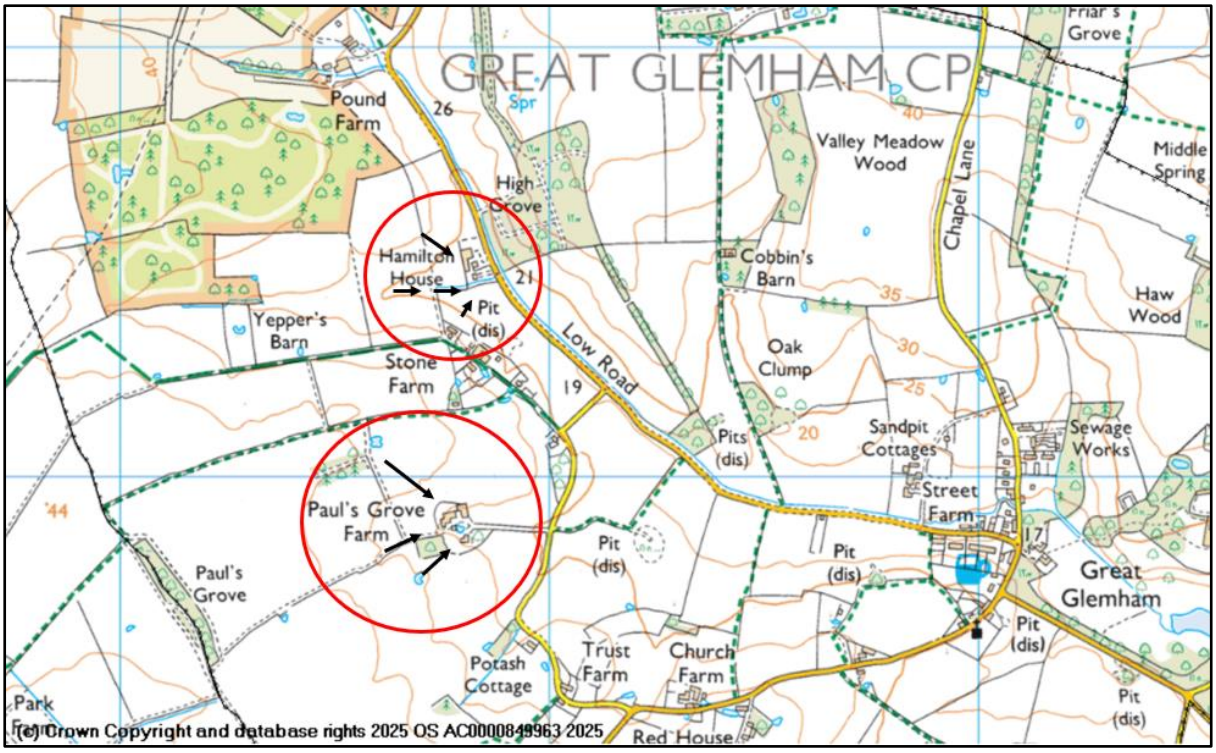

Fig. 11. Approximate floodwater flow paths in Low Road (west) and Workhouse Lane

In summary:

- Intense and prolonged rainfall exceeded field drainage systems and surface water flowed across fields, flooding property.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) measures.
- Landowners to carry out watercourse maintenance to reduce flood risk as necessary in accordance with their riparian responsibilities.

4. Parham Airfield

One property at Parham Airfield was reported to have flooded internally to an approximate depth of 5cm, attributed to surface water runoff from fields. It was projected to be at high surface water flood risk and no fluvial flood risk.

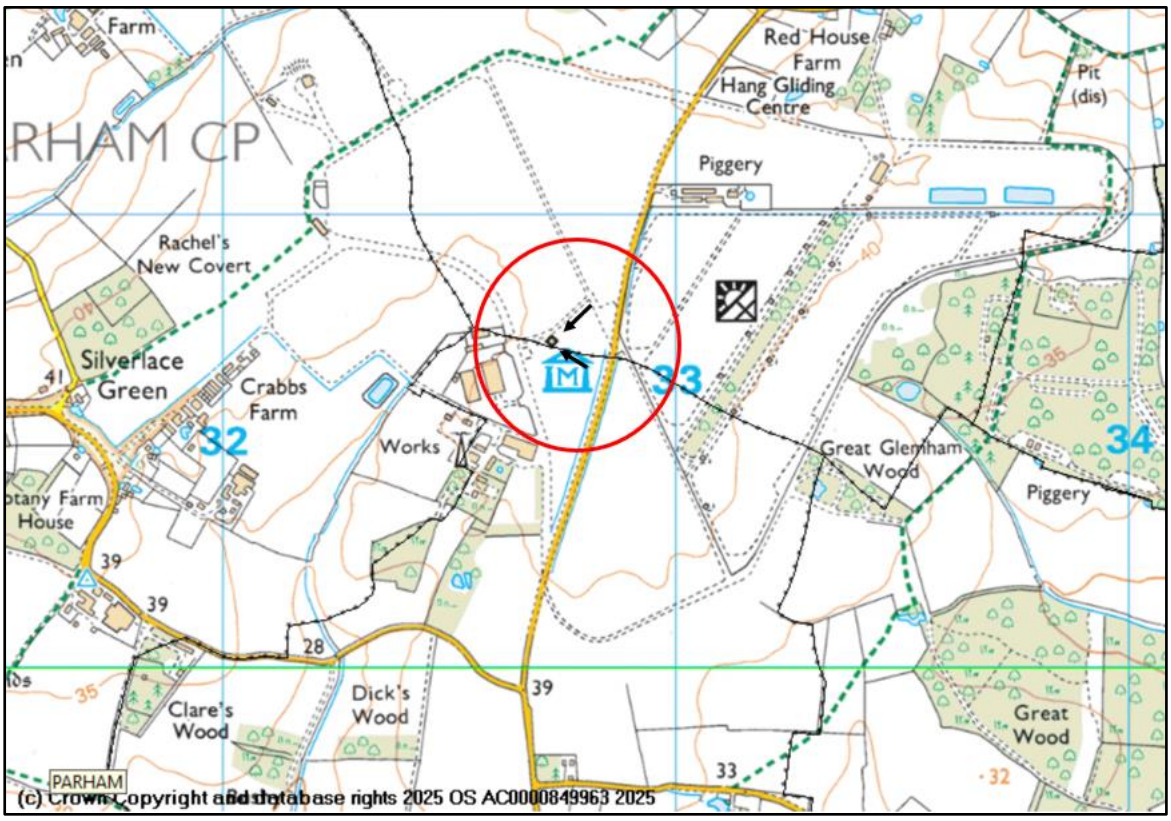

Fig. 12 Approximate floodwater flowpaths, Parham Airfield

In summary:

- Intense and prolonged rainfall caused surface water to flow across fields and flood lower-lying property.

Recommended actions:

- Residents to install Property Flood Resilience (PFR) measures.

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

Risk Management Authority	**Relevant Flood Risk Function(s)**
Suffolk County Council	Lead Local Flood Authority, Highways Authority & Asset Owner
Environment Agency	Lead organisation for providing flood risk management under its permissive powers and warning of flooding from main rivers
East Suffolk Council	Local Planning Authority & Asset Owner
Anglian Water	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	Improving flood resilience to property and some riparian responsibilities if adjacent to watercourses.
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	Responsible Party	Progress
Offer of £5k Property Flood Resilience (PFR) grant funded scheme to eligible properties that flooded during Storms Babet	Suffolk County Council Lead Local Flood Authority (LLFA)	Application window now closed. Installation of PFR measures on approved applications has been extended to December 2025.
Ensure riparian landowner responsibilities are understood with regard to watercourse management	SCC LLFA	SCC published "Flood Smart Living" handbook designed to increase flood resilience for residents, landowners and communities, November 2024
Ensure silt is not obstructing flow under road bridge over	SCC Highways	Inspection carried out December 2023 and no silt

watercourse on Chapel Lane (Structures Asset 001911)		removal considered necessary.
Investigate highway drainage assets in Low Road in the vicinity of reported blockages	SCC Highways	Cleansing and jetting carried out in September 2024. (Further investigation is being planned).
Annual channel maintenance (vegetation cut with hand tools) undertaken along a stretch of main river approx. 800m in length starting upstream of the village and ending downstream of Chapel Lane.	EA	Completed in March 2025. Next cut programmed for early 2026

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 Great Glemham. 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 (February 2026)
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	Great Glemham Parish Council	6 months	**Ongoing:** The framework for the village emergency plan will be discussed at the quarterly meeting in February. A working group of councillors will take it forward for agreement at the next meeting in May.
Residents to consider installation of Property Flood Resilience (PFR) measures	Residents	N/A	DEFRA PFR Grant has now closed for new applications. Installation of PFR measures on approved applications had been extended to December 2025. Further information on PFR measures can be found within SCC published "Flood Smart Living" handbook. There is currently no active PFR schemes being managed by the LLFA in Suffolk.

Riparian landowners to carry out appropriate watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities. See Appendix A.	Riparian landowners	N/A – to be completed as required	Further information on Riparian Ownership can be found within SCC published "Flood Smart Living" handbook.
Utilise the Community Self Help scheme to undertake minor maintenance activities.	Great Glemham Parish Council / Suffolk Highways	6-12 months	Further information can be found at the following https://www.suffolk.gov.uk/roads-and-transport/highway-maintenance/community-self-help-scheme
Investigate highway drainage assets in Low Road in the vicinity of reported blockages	SCC Highways Authority	6 months	Ongoing - Update from Suffolk Highways: Inspections identified defects at Gully 60062845 (root ingress) and Offlets 60062850 and 60062852, where exposed or buried pipework and poor ditch levels restrict discharge. Further excavation, ditch regrading, and reinstatement are planned to restore reliable operation.
Inspect road bridge over watercourse on Chapel Lane (Structures Asset 001911) to ensure silt is not obstructing flow	SCC Highways Authority	6 months	Complete - Update from Suffolk Highways: The bridge was last inspected on 19th Sept 2025 – At the time of this inspection low levels of siltation were noted with only slight disruption to flow – No works to clear silt were considered necessary.
Medium Term Actions (e.g. longer planning timescales and potential need to source funding but potential for greater impact)			
Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to "slow the flow" and attenuate water	Landowners, supported by relevant authority, resource	12 - 24 months	Further information on NFM measures can be found within SCC published "Flood Smart Living" handbook.

in the upper catchment of Great Glemham on the surface water flow paths and ditches. See Appendix A.	dependant (SCC LLFA, EA)		
Long Term actions (significantly longer timescale and budget required with potentially greater positive impact)			
Deliver any capital interventions that are economically, technically and environmentally feasible and acceptable to improve the flood resilience of the village, eg. NFM FR measures.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	Ongoing – No update expected at this time.

Approval

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

Reviewer	Date of Review
Ellie Coleby	09/03/26

Disclaimer

This report has been prepared and published as part of Suffolk County Council's responsibilities under Section 19 of the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore while all reasonable efforts have been made to gather and verify such information may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event. Should there be additional information available to develop the report, please email to floodinvestigations@suffolk.gov.uk.

The opinions, conclusions and recommendations in this Report are based on assumptions made by Suffolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Suffolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Suffolk County Council expressly disclaims responsibility for any error in, or omission from this report arising from or in connection with those opinions, conclusions, and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to Suffolk County Council highlighting flooding to properties at a street level. Property owners and prospective purchasers or occupiers of property are advised to seek and rely on their own surveys and reports regarding any specific risk to any identified area of land.

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APPENDIX A - Indicative locations for NFM and watercourse maintenance