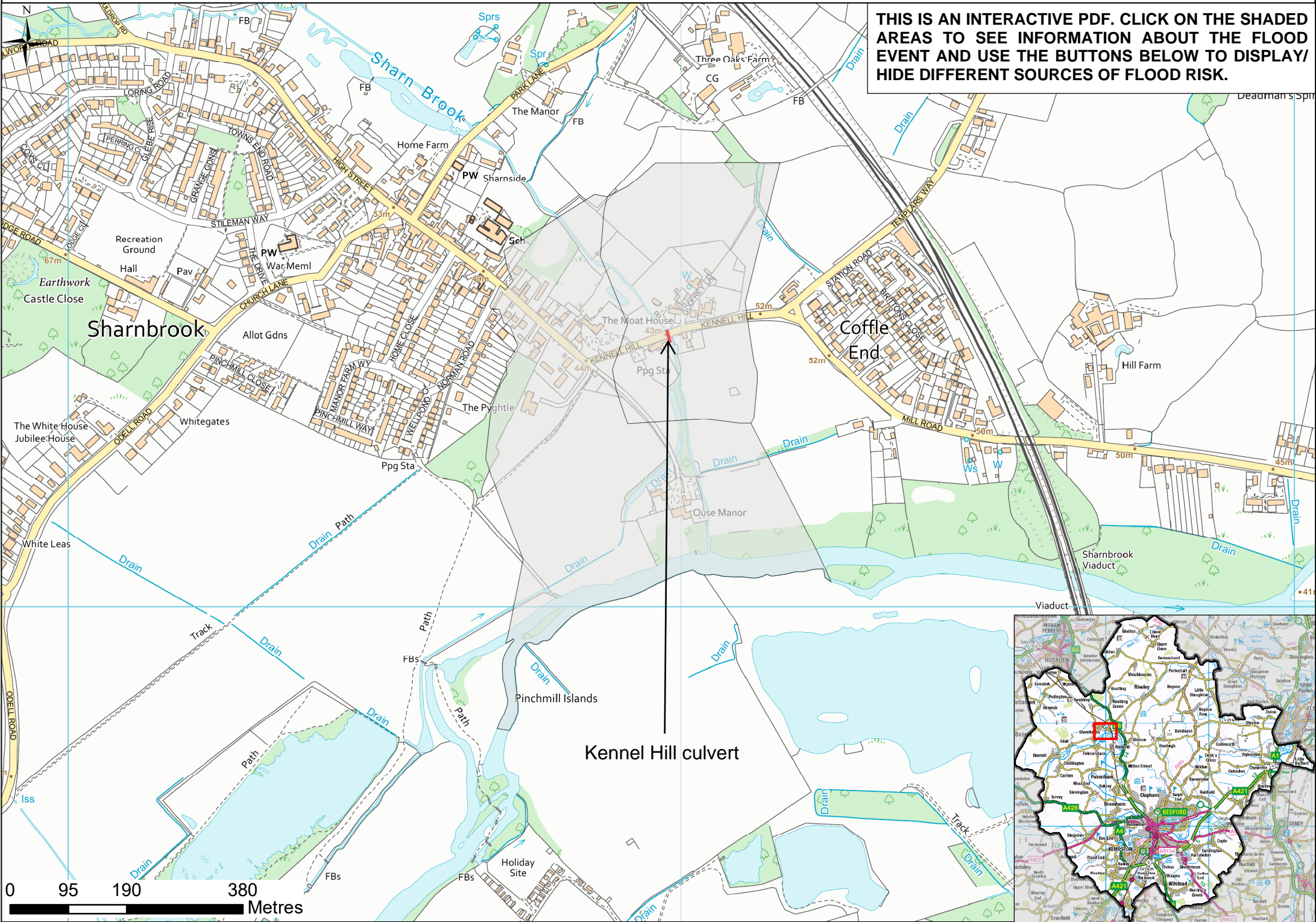


# Section 19 Flood Investigation Report: Sharnbrook

The village of Sharnbrook suffered flooding in December 2020. Under the Flood and Water Management Act 2010, Bedford Borough Council as the Lead Local Flood Authority (LLFA) has the duty to investigate the flood event. The scope of this flood investigation is to identify the source, cause and impact of flooding from available information; identify actions completed by relevant Risk Management Authorities (RMAs) in response to the flood event; and consider actions to better understand and manage the risk of flooding in the affected area.



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**Legend**

Postcode Boundary

EA Flood Warning Areas

Flood Warning Areas

**Flood Map for Planning**

Flood Zone 3

Flood Zone 2

Areas benefitting from flood defences

**Risk of Flooding from Surface Water**

High risk of flooding (3.3% AEP)

Medium risk of flooding (1% AEP)

Low risk of flooding (0.1% AEP)

**CLICK ON THESE BUTTONS**

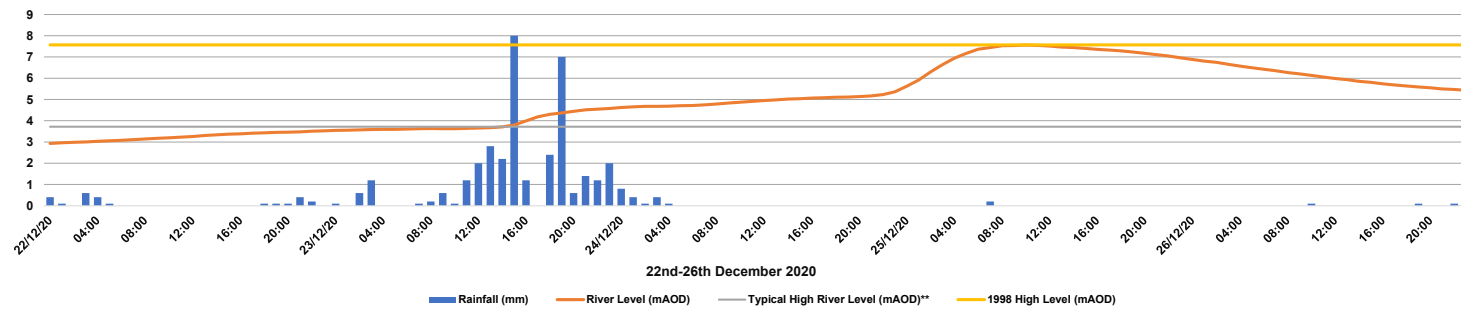
FLOOD MAP FOR PLANNING

RISK OF FLOODING FROM SURFACE WATER

FLOOD WARNING AREAS

BACKGROUND MAP

## Rainfall and River Data \*



\*Rainfall and River data was obtained from the Environment Agency (May 2021)

\*\*River levels below this level 90% of the time.

## Rainfall and River Gauges

Nearest Rain Gauge	Thurleigh
Distance to Gauge	5.14 km
Nearest River Gauge	Sharnbrook
Distance to Gauge	1.4 km

## Rainfall and River Data Interpretation

The graph identifies that the main rainfall event at the nearest rainfall gauge to Sharnbrook occurred between 08:00 on December 23rd and 04:00 on December 24th. The total rainfall volume is recorded as 34.7mm with a peak rainfall intensity of 8mm/hour. This single event saw more than half of the 55mm of rainfall which is expected for the whole month of December on average.

The graph shows that the river levels in the Great Ouse were elevated above the ‘typical high river level’ from 15:00 on December 23rd and stayed above this level until beyond December 26th. The ‘typical high river level’ at the nearest gauge station is identified as 38.2m Above Ordnance Datum (AOD). River levels above this are only expected to be recorded 5% of the time. For context, the 1998 peak flood level is included, which was recorded as 39.5m AOD, and the graph shows that the December 2020 river levels reached the 1998 level at 07:00 on December 25th.



**SOURCE OF FLOODING:** Watercourse / Main River

## FLOOD EVENT & CAUSE

The Sharn Brook (an Ordinary Watercourse) flows through Sharnbrook to the east of High Street. It crosses beneath Kennell Hill and discharges into the River Great Ouse approximately 375m further south.

One residential property located adjacent to the Sharn Brook to the south of Kennel Hill reported internal flooding on December 23<sup>rd</sup>. The resident reported flood depths of up to 30mm in the basement as well as cracks in the basement building fabric, however it is not clear whether this is the direct result of flooding. Another residential property located adjacent to the northern bank of the River Great Ouse reported internal flooding on December 25<sup>th</sup>. Both properties are located in Environment Agency Flood Zone 3<sup>1</sup>, which means that the chance of river flooding is greater than 1% in any given year. Only the property located near the River Great Ouse is located in the Environment Agency Flood Warning area.

A blocked gully on Kennel Hill was reported to Bedford Highways on December 29<sup>th</sup>, which may have exacerbated the flooding experienced.

December 2020 was a very wet month with an average rainfall of 108mm across East Anglia, which is 95% higher than the December average<sup>2</sup>. The three months leading up to December also saw higher than average rainfall such that by December 23<sup>rd</sup> the ground was already saturated. This, combined with the rainfall recorded during the dates in question, meant that surface water was less able to infiltrate into the ground and more likely to run off into the Sharn Brook and River Great Ouse. In conclusion, it is thought that this prolonged period of heavy rainfall and saturated ground conditions contributed to the River Great Ouse overtopping its banks. The high river levels in the Great Ouse would have prevented the Sharn Brook from discharging freely, pushing water upstream and contributing to the Sharn Brook overtopping its banks. Any maintenance issues with the Sharn Brook would have further exacerbated the flooding.

## FLOOD WARNINGS & IMMEDIATE RESPONSE

- **22/12/2020 08:57:** Environment Agency Flood Alert Middle River Great Ouse in Milton Keynes, Bedford Borough and Central Bedfordshire issued.
- **23/12/2020:** Lead Local Flood Authority (LLFA) officers monitored/assessed locations based on the conditions and forecast predicted.
- **23/12/2020 17:14:** Fire service provided flooding advice to residents.
- **24/12/2020 evening:** Police volunteers mass leaflet drop to warn residents of likely flooding.
- **24/12/2020 21:11:** Environment Agency Flood Warning River Great Ouse at Felmersham, Sharnbrook, Bletsoe, Pavenham, and Milton Ernest issued.
- **25/12/2020 07:53:** Fire service responded to request for sandbags.
- **25/12/2020:** LLFA visited to provide assistance on the ground.
- **25/12/2020 14:30:** Flooding experienced in the wider area declared a major incident by Bedford Borough Council.
- **28/12/2020:** LLFA, Bedford Flood Response Team, and volunteers from the Council visited properties to carry out impact assessment to help with recovery and clean up.

## ACTIONS

Timescale	Action	Responsible Party
Complete	Inspect highway drainage and clear any blockages. A blocked gully was cleared on Kennel Hill in March 2021.	Bedford Highways
Inspections short term (1-6 months) Remedial works (as required)	Inspect Main River assets (sluices, weirs, gates, locks and river banks) and identify the requirement for remedial works. Over 5,000 checks are already complete across East Anglia (95% of relevant assets), with 22 assets identified as being in need of remedial works in the wider area <sup>3</sup> .	Environment Agency
Medium term (6-12 months)	Investigate the potential benefits and local appetite for a community flood group. The flood group should enable access to flood kits, flood action plans, and information about flood warnings/alerts and Property Flood Resilience (PFR).	Lead Local Flood Authority
Medium term (6-12 months)	Liaise with landowners to set a suitable inspection and maintenance regime for the Sharn Brook.	Lead Local Flood Authority / Riparian Owners
Medium term (6-12 months)	Investigate whether the Flood Warning system can be extended to include the Flood Zone 3 areas surrounding the Sharn Brook.	Environment Agency

**ORIGINATED:** Nora Balboni CEng C.WEM MCIWEM, Senior Engineer, 21/07/2021

**CHECKED/VERIFIED:** Matt Tandy C.WEM MCIWEM MInstLM, Principal Engineer, 23/07/2021



<sup>1</sup> Environment Agency Flood Map for Planning, <https://flood-map-for-planning.service.gov.uk/>, [accessed June 2021].

<sup>2</sup> Environment Agency, December 2020 Flooding Great Ouse Catchment Summary.

<sup>3</sup> Environment Agency, May 2021. Harrold Winter Flooding Briefing.