

Shepton Montague Flash Flood

9th May 2023

Note: for viewing on a desk-top with internet access, photos are accessed by holding 'Ctrl' and left-clicking the foot-note

1. Executive summary

1.1 On the 9th May a thunderstorm of unusual intensity and duration dwelt stationary over the village, resulting in an extensive flash flood.

1.2 The volume of water was such that all existing drains were completely overwhelmed, and the roads and fields flooded extensively in several valley-bottoms.

1.3 An unexplained body of water suddenly entered the middle reaches of Cattle Hill and traumatised the occupants of at least two vehicles.

1.4 In Higher Shepton, the worst affected area, the water in the road formed a river some 0.9m deep, occupying the entire 6m width. A resident was caught in the rising water and suffered hypothermia.

1.5 In total at least 17 properties suffered water damage, 7 of which were deemed so severe as to require evacuation and longer-term remediation.

1.6 Six cars were written off: fences, gates and several stone walls were demolished, and a number of poultry were swept away.

1.7 **Horns Lane** is severely damaged and impassable.

1.8 Tons of rubble are blocking the culverts in Higher Shepton.

1.9 A straw-man model suggests that the local rain-intensity must have been at least 40mm/hour, possibly concentrated on hills surrounding the upper reaches of cattle Hill.

2. What happened?

2.1 A prolonged thunderstorm started in the afternoon of Tuesday 9th May, accompanied by hail and extremely heavy rain. This commenced around 15:30 and persisted for around 90 to 120 minutes before reducing in intensity to what might be described as "normal heavy" rainfall. The storm seemed to hold stationary over the parish for some time, rather than passing over as is a more normal event.

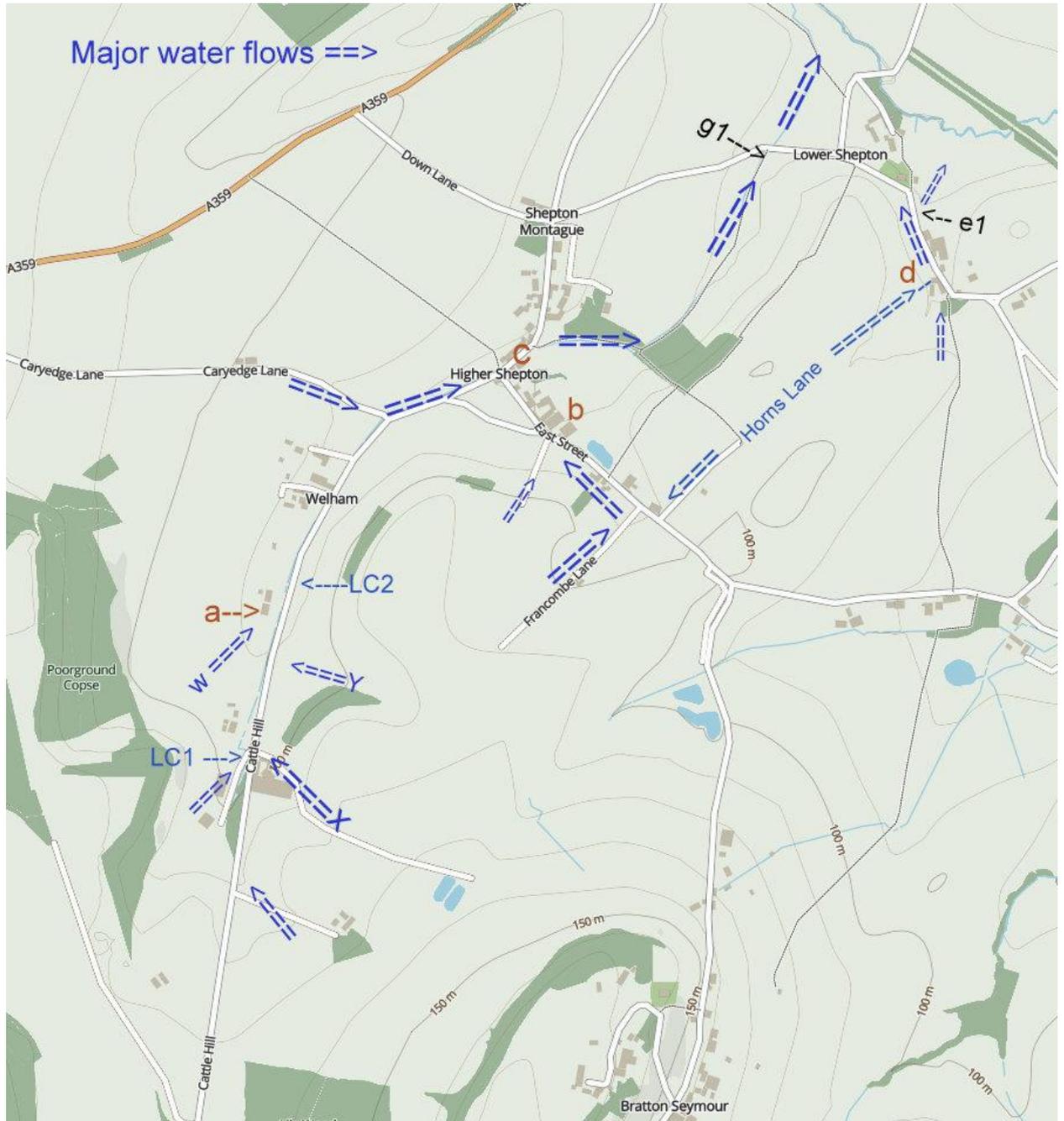
2.2 None of the local Water Resource¹ rain gauges are located close to Shepton Montague, but the nearest (Lovington) recorded **around 50mm for the day**. Similar figures were recorded in North Dorset and Somerton.

2.3 The intense rainfall which fell between approximately 15:30 and 16:45 turned every farm track and low-lying road within the parish into a river: this happened very quickly and without warning. This resulted in some 17 homes flooding, as detailed below.

¹ <https://eip.ceh.ac.uk/hydrology/water-resources/>

There were four principal areas affected (see Water Flows map²):

- **Three houses plus the Welham Farm development on Cattle Hill (a)**
- **One commercial premises and one farm in lower East Street (b)**
- **9 properties, the epicentre in Higher Shepton (c) in the section from the junction with East St up to Shepton House**
- **Three homes in Lower Shepton (d)**



3. Flooding event & water flows in more detail

3.1 Cattle Hill

- Cattle Hill runs down a natural trough in the landscape, and looking at the local topography, around **2 square km** of land-area ultimately drains down to this road.

² <https://photos.app.goo.gl/K6sHnQ1851Ly6pZy8>

- Witness statements confirmed that a considerable volume of run-off water was present as high up as Seart's farm-track (photo³), where a large moraine of stones & rubble has been deposited, damaging a modern concrete drive.
- **At the point marked LC1** on the map, Michelle Hix was driving her SUV past Lily Farm when a "Tsunami" of water suddenly descended down the easterly track (marked X). This surge knocked her vehicle sideways across the road and ripped up the tarmac on the road junction (photo⁴).
- At the same time, at **the point marked LC2** on the hill, Jacqueline Sheekey was driving her son home from Sexey's School in a BMW Mini. The surge hit her car and swept over the bonnet. Her son, in the rear seat, wound the window down and called to a van parked higher up the hill for assistance. He was pulled out of the car through the back window, followed by Ms Sheekey. By this time the water was over the roof of the car. The abandoned car was very badly damaged and subsequently written off.
- On the southern boundary of the cottage "Vernigore" (adjacent to the open fields, 'a' on map) is an open steel fence, followed by 1ft ditch surmounted by a 2ft bank. Beyond that a woven-panel garden fence. The run-off from the fields ('W') broke through all barriers, demolished several sections of fence (photo⁵), and flooded the garden and house. The elderly occupants have had to be re-housed.
- Two adjoining houses north of Vernigore were also flooded, but no further details are available at present.

3.2 Higher Shepton

- In a very short period between 16:00 and 16:30 the flow of water descending from Cattle Hill rose in level and peaked at about **900mm depth at the location marked g on the map**⁶. The road width between the bounding walls is around 6m at this point: two 4m sections of 400mm-thick wall on the south-side collapsed under the pressure. This photo⁷ shows the situation at 16:18 in position f. Additionally, the water had spread several metres into the field north of the road.
- One resident was trapped in the water for 90 minutes between his door and a wooden shutter which he was attempting to put in place: he suffered bruising and hypothermia and an ambulance was called.
- All the houses marked 'X' on the map were flooded, 6 of which were deemed unsuitable for habitation due to the entire ground floor contents being lost. Three families chose not to re-home despite having no boiler or working kitchen.

³ <https://photos.app.goo.gl/QkMNbHH1iCwvKTsM6>

⁴ <https://photos.app.goo.gl/YGby69qjKwV7Zzy77>

⁵ <https://photos.app.goo.gl/UuoUuZYzMwjfbRW28>

⁶ <https://photos.app.goo.gl/kEv4uk7CobwLYJZX6>

⁷ <https://photos.app.goo.gl/3bEMzHABnTVzKwGi6>

- Around position marked 'sp' on the map, several springs spontaneously broke through the road surface. The damage is still evident.



- At position 'sf' a 3.7m stock fence backed with chicken wire blocked with debris and collapsed, together with a total of 15m of stone walling in 3 sections along the stretch marked 'wa' (photo⁸).
- The water overwhelmed the culvert and the surrounding field (photo⁹), sweeping away four hens and leaving a moraine running parallel with the culvert. At this point and further downstream the newly-created river was more than 25m wide.
- The flood then enters the orchard¹⁰ beyond the culvert, turning left and following/joining the small stream which runs NE from East Street.
- The flood then met the hedges bordering the road, and the debris clogged a 15ft farm gate (located at 'g1' on the flows map), which buckled (photo¹¹) under the load, prior to ripping out the steel gatepost and releasing the water.

⁸ <https://photos.app.goo.gl/NSSGa5wfHNPSyCVk8>

⁹ <https://photos.app.goo.gl/8SHs93dhR2NLFh5M7>

¹⁰ <https://photos.app.goo.gl/UbytjNzEgKGhDLD1A>

¹¹ <https://photos.app.goo.gl/FY3gM16ovCYwFzeG6>

3.3 East Street

- Large volumes of water ran down from both the Francombe Lane farm track and from the south-eastern end of Horns Lane: here the tarmac adjoining the road was lifted and damaged (photo¹²).
- Two premises in BA9 8JJ were flooded from East St: Dovecote Gallery and Higher Farm. In the gallery the staff managed to rescue several £10k's of client artwork from the ground floor. If the event had taken place outside working hours, they would have suffered a major financial catastrophe.
- Water continuing down East St joined with the flow from Cattle Hill and contributed to the devastation in the centre of Higher Shepton.

3.4 Lower Shepton

Three properties affected.

- A large body of water descended into the road from the north-western end of Horns Lane, bringing with it several tons of rubble (video¹³). In order to make the road passable, this was cleared by the local farmer, Jack Dowding (photo¹⁴).
- Horns Lane itself was badly damaged and is now impassable.
- Most of the water exited the road via a new entrance/driveway (marked 'e1' on the Water Flows map). The water ultimately discharged into the River Pitt.
- Lower Farm (which is higher than the adjacent Horns Lane) was flooded from run-off from the fields rising to the south behind the property: Lower Farm Cottage along the road had water ingress affecting floor-coverings, as did Long Barn, but in the latter case it was due to clean rain-water penetration, not run-off from adjacent land.

3.5 The Newt?

4. Aftermath

- **Four households** are now living in temporary accommodation for a period of up to a year whilst their homes are dried out and refurbished.
- **Three other families** are living in houses deemed unsuitable for habitation by their insurance companies.
- A total of **six cars were total write-offs**, and 4 hens perished.
- The two women who were trapped on Cattle Hill were severely traumatised, as can be heard in the recording of their witness statements. Ms Sheekey and her son didn't sleep properly for several nights, and she was unable to drive for two days. Michelle Hix said it was the most frightening experience of her life.

¹² <https://photos.app.goo.gl/Aa1BJaKkVdN1bVNd8>

¹³ <https://photos.app.goo.gl/1zkx3DxGkeVYLJN88>

¹⁴ <https://photos.app.goo.gl/CfmM3hVxTTKs7WQF9>

- The culvert running NE from C2 in the field in Higher Shepton is normally around 1.4m deep x approximately 2m wide. Over the length indicated it is now full of several tons of stones (up to 30cm across) to within 30cm of ground level.
- Many piles of rubble remain, together with damaged tarmac as outlined previously.
- Horns Lane is so badly damaged (photo¹⁵) that the necessary access to fields for harvesting will not be possible until repairs are made.

5. Analysis

- A simple model is set out in Table 1, which attempts to calculate the rate at which rain would need to fall in order to generate the volume of water flowing through Higher Shepton.
- The **Volume flow** is reasonably determined by observing the flow parameters seen on video and measuring walls, road width etc.
- The **Maximum rainfall rate** (40mm/hour) is then input to roughly balance the observed flow-rate. Net transmission is a guess, catchment area an estimate.

| Mean velocity | | Road width | Mean depth | Volume flow | |
|---------------|-------|------------|------------|-------------|-------------|
| (mph) | (m/s) | (m) | (m) | m3/sec | m3/min |
| 7 | 3.1 | 6 | 0.9 | 16.9 | <u>1014</u> |

| Total catchment area | | Maximum rainfall rate* | | Gross volume | | Net Transm ission | Net peak flow | |
|----------------------|-----------|------------------------|--------|--------------|--------|-------------------|---------------|-------------|
| (km2) | m2 | mm/hr* | mm/min | m3/hr | m3/min | | m3/sec | m3/min |
| 2 | 2 million | 40 | 0.67 | 80000 | 1333 | 80% | 17.8 | <u>1067</u> |

Table 1 Spreadsheet predicting water flow rate v rain rate (Higher Shepton)

- As of the date of writing this document, the “Tsunami” event at LC1 on Cattle Hill remains a mystery.

6. Scope / disclaimer

This document does not attempt to address any issues relating to the state of maintenance of the drainage system, changes to farming practice, or recent local infrastructure developments.

¹⁵ <https://photos.app.goo.gl/X5GnG9rLZs22zWnB6>

7. Version control

| Rev | | Date | Author |
|------|---------------------------------------|----------|---------|
| 0.3 | Incomplete draft for comment | 03/06/23 | JBS |
| | Draft incorporating feedback and with | | |
| | Exec Summary, Analysis & Scope | | |
| 0.9 | added. Awaiting possible Newt input | 04/06/23 | JBS |
| | Comments from Robert Mitchell | | |
| 0.9a | incorporated | 04/06/23 | JBS/ RM |
| 0.9b | Converted to pdf | 04/06/23 | RM |