

## Section 19 Investigation Report

As the Lead Local Flood Authority for Somerset, we have a duty to investigate flood incidents as outlined within Section 19 of the Flood & Water Management Act 2010.

<b>Date of Incident</b>	28 <sup>th</sup> June 2021	<b>Date of Report</b> <b>Version</b> – 5.4 21.09.2022 <b>Status</b> all corrections added
<b>Site / Catchment Location:</b>	Chard, Combe St Nicholas / Wadeford, Wambrook, Nimmer, Tatworth & Forton, Chaffcombe	

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**SOMERSET**  
County Council

## Introduction

The function of a Section 19 report is to gather information on the happenings during a particular flood event. They are known as a Section 19 report because they are required under Section 19 of the Flood and Water Management Act 2010. The legislation says:

### *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.

In addition, a Section 19 report will often detail any ongoing work with regards to flooding in the area, and will signpost additional work that should be considered, usually in the form of investigations to be done.

It is not the function of a Section 19 to provide concrete solutions for flooding. This requires far more detailed technical work, liaison with landowners, and decision making about schemes in concert with the public and other stakeholders, although the Section 19 report can help in demonstrating the need for this work and securing future funding. Also, it is impossible to prevent absolutely *all* flooding in *all* circumstances – rainfall events vary widely in intensity, and whatever drainage systems or flood mitigation schemes are put in place, there is always the possibility, however remote, that an extreme rainfall event will overwhelm them. We can, however, plan for the vast majority of rainfall events, and in the course of doing so, make extreme events less impactful. Even a small difference in the final height or path of flood water can be the difference for some between their homes flooding and not, so even small schemes can have value in an extreme rainfall event.

The usual way to describe the severity of rainfall events is to talk in terms of '1 in X years'. If we take the example of a 1 in 100 year event, this is an event of a size that will be equalled or exceeded *on*

*average* once every 100 years. This means that over a period of 1,000 years you would expect the one in 100 year event would be equalled or exceeded ten times. But the distribution of events is not even over the 100 years - several of those ten times might happen within a few years of each other, and then none for a long time afterwards. This report deals with a rainfall event of 1 in 300 year intensity, so the flooding in terms of extent and depth was much worse than that resulting from a 1 in 100 year event, which is shown on Environment Agency flood maps.

The appendices to this report show selected photographs sent in by residents showing flooding in progress, and maps showing more detail of the area. We are grateful to residents for the information they have provided which has enabled the compilation of this report.

### Area Information

Chard is a town of approximately 13,000 people in south Somerset. It sits on the eastern edge of the Blackdown Hills, and as such has steep slopes to the west and north/west. It sits on a watershed, a ridge of land which separates water flowing to different rivers, with most the drainage in the town heading towards the River Isle, but some drains are connected to the River Axe.

There are a number of surrounding villages, many sitting along the route of the River Isle and other watercourses. Several of these, especially Wadeford, were badly affected by the weather event

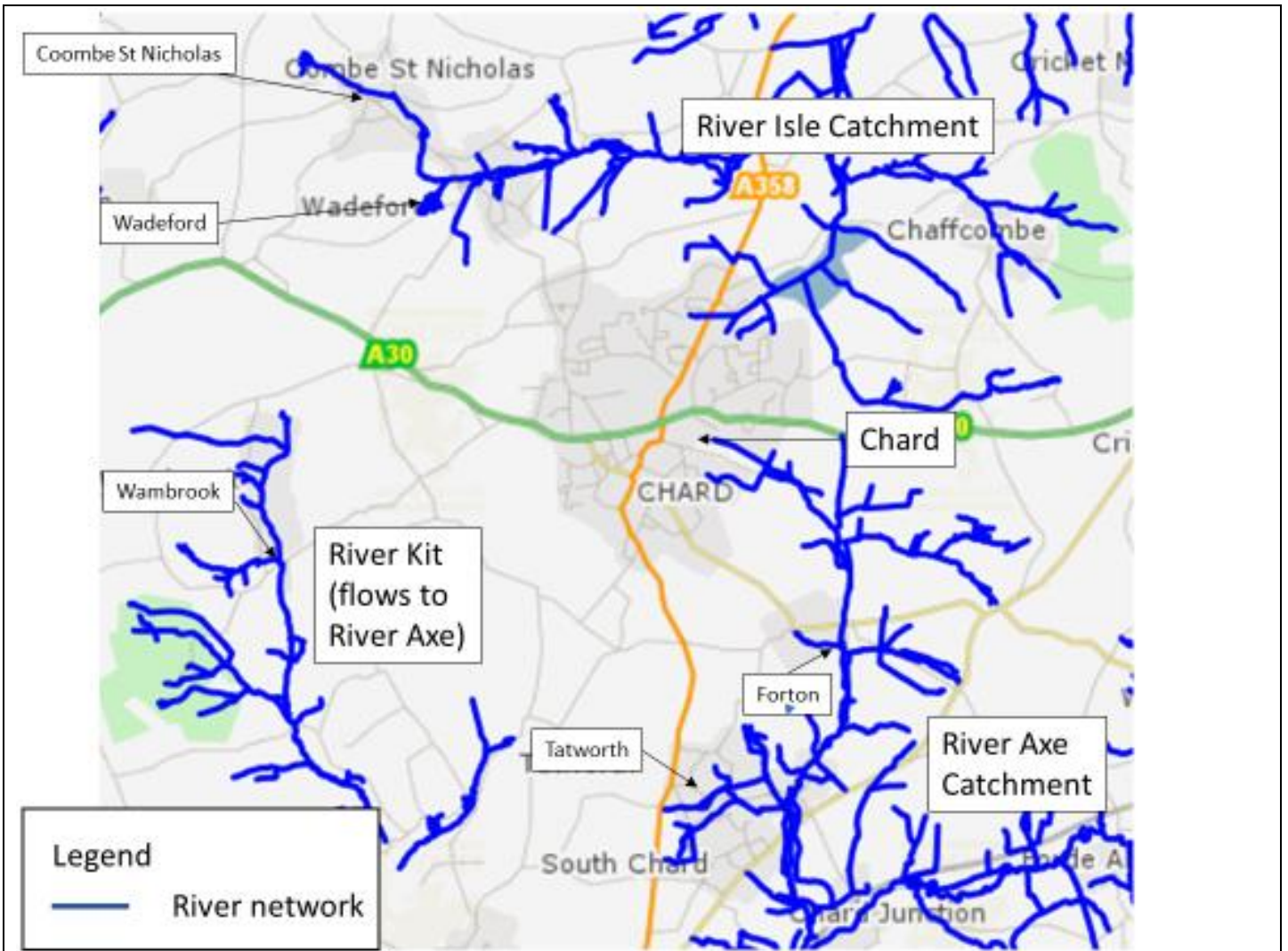
This report covers the heavy rainfall incident on 28<sup>th</sup> June 2021, and the subsequent flooding in Chard and surrounding villages and hamlets.



**Figure 1 - Site Plan of Chard Town showing neighbourhoods**

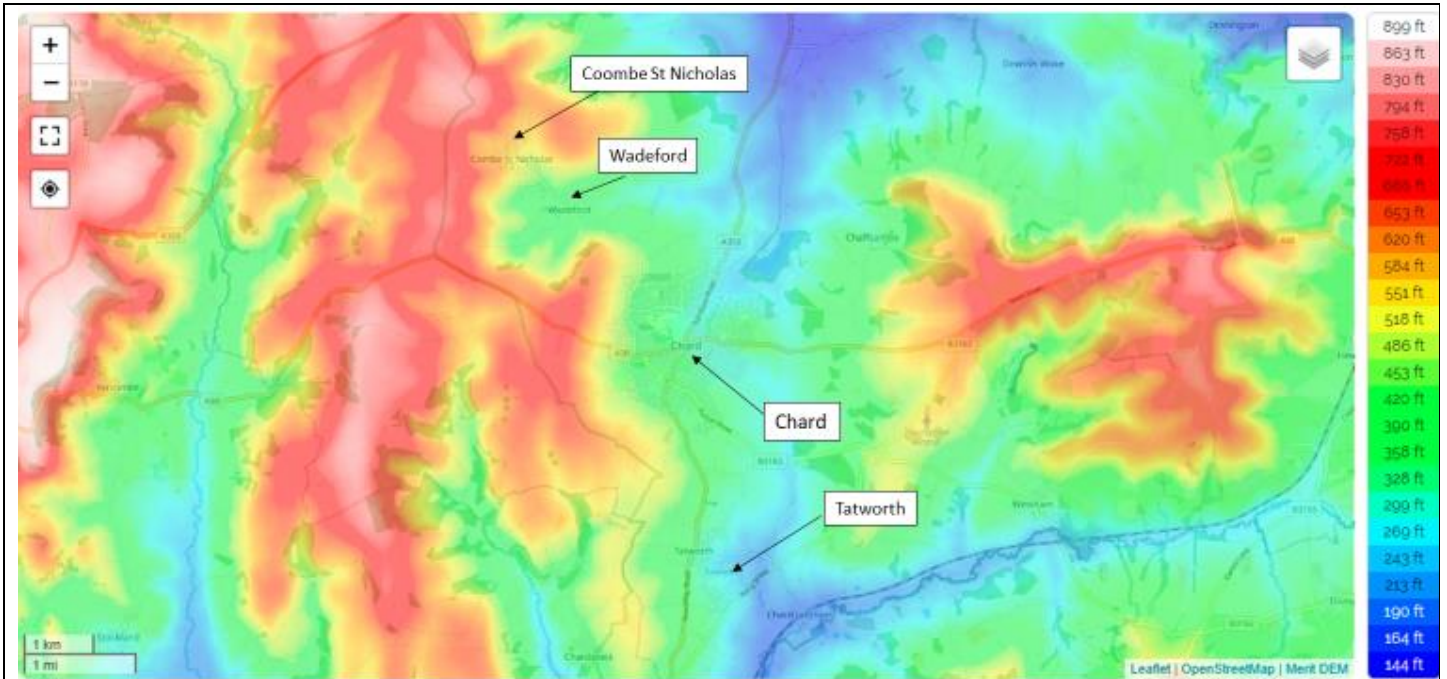
Maps of the villages around Chard and their important features can be seen via the following link:

[Link – Maps of villages](#)



**Figure 2: Detailed river network**

This map shows the river network around Chard and surrounding villages. The villages labelled are some of those affected by the flooding. There is a short stretch of main river, heading northwards from Chard Reservoir, towards Ilminster. Main rivers are those under the responsibility of the Environment Agency in terms of maintenance and improvement. The other rivers and streams shown are ordinary watercourses. These are usually the responsibility of the riparian owners – those who own property which is next to the watercourse or has the watercourse run through it – unless there are legal documents which state otherwise.



Chard, South Somerset, Somerset, South West England, England, TA20 1OE, United Kingdom (50.87367 -2.95974 )

**Figure 3: Topography.**

This shows the form and, most importantly, height of the land surrounding Chard. Pink and red land is the highest, with blue at the lowest points. From this we can see that there are substantial hills to the west and east of Chard (the Blackdown Hills), and very steep slopes down into the low points around Chard reservoir and Tatworth.<sup>1</sup>

<sup>1</sup> [Chard topographic map, elevation, relief \(topographic-map.com\)](http://topographic-map.com)





Impact and  
Extent of  
Flooding -  
Summary

Flooding was widespread across Chard and surrounding villages on 28<sup>th</sup> June 2021. Chard itself was extensively flooded, especially across the centre of the town, the Furnham Road area, Glynswood, and roads on the western side of the town. The flood waters were deep enough to prevent traffic moving around the town, especially in the High Street and around Furnham Road, and many houses and businesses were flooded internally. Elsewhere Forton, Tatworth, Wambrook and Higher Wambrook, Wadeford, Combe St Nicholas, and Scrapton Lane were all affected by property flooding. Whitestaunton also suffered road damage, as did Scrapton lane.

The effect on many has been devastating. Homes and businesses have seen property damaged and belongings destroyed. Businesses have been prevented from trading and are now finding insurance hard to secure. Some people found themselves in life threatening situations or in fear of personal harm. Many were recovering when another flood incident occurred the following October (this will be covered in a separate report).

The overarching problem was the sheer volume of rainfall. This was well beyond what any residents of the area had seen in their lifetimes. This combined with the topography of Chard to funnel large volumes of water across Chard and down through many villages and hamlets at great speed and depth. This report will examine how the infrastructure coped with this exceptional volume of rainfall, and question whether anything can be done to reduce the effects of extremely high rainfall events in future.

Impact and  
Extent of  
Flooding

Over the 28<sup>th</sup> June 2021, flooding was extremely widespread in Chard and the surrounding area. In an incident of this nature, it is difficult to collate exact numbers of properties affected, and whether flooding was internal, or external. From reports, we know that at least 100 properties were affected.

The main cause of flooding in Chard was the high volume of rain, and the resultant overland flow of rainwater. This entered Chard from several locations, coming in from high ground to the west and north in particular, and working its way east to accumulate in the topographical low points at the north-east and south-east of town. When overland flows from the fields above Crimchard reach the edge of the town they are swelled by runoff from the urbanised parts of Crimchard. These flows continue downhill into the town, with the urban contribution becoming more significant lower down the catchment. This water then continues through streets and gardens, with much of it heading toward the area around Holyrood Community School at the bottom of this catchment.

A variety of agencies were present on the night of the event, fulfilling their statutory duties. The Fire Brigade were attending life threatening emergencies, the Police were out closing roads and assisting with emergencies, South Somerset District Council and The Civil Contingencies Unit had duty officers out who opened a flood relief centre and organised the distribution of sandbags. Members of Town and Parish councils were out helping residents to protect their homes and get to safety. They were also unblocking drains around Church Street, Old Town, Holyrood Street and Millfield. Highways had no statutory duties as regards to emergency response, but teams were out trying to clear drains wherever possible. Over the following days they visited various sites where debris has been washed into the road, to clear up and identify road areas which needed repair. The Environment Agency fulfilled their statutory duty on the night by issuing flood warnings on main rivers.

Furnham Road, Furnham Road Industrial Estate, and parts of Glynswood were badly flooded. Furnham road was particularly badly flooded outside B&Q. Furnham road suffered particularly deep flooding, believed to be over a metre in depth.

Flooding around the High Street was shallower, but fast flowing on the highways. There were reports of houses flooding in the High Street but which ones has not been firmly ascertained.

Flooding around Crimchard Road was shallow, but flowed with sufficient speed and force to carry rocks and debris down the road. Water came down past Park Cottages and Catchgate Lane, from the direction of Wadeford and Foxdon Hill.

The main access route across Chard – consisting of the High Street and Furnham Road, was closed by Police as being too dangerous to try and traverse by car. The flooding along this route caused issues for the emergency services, as the route could not be crossed by normal emergency vehicles.

At Glynswood there was some fluvial flooding. A stream which runs across the open area bordering the leisure centre and Holyrood Academy, enters a culvert at the eastern end of Glynswood. This culvert, which has a trash screen, was reported to have been blinded due to the volume of debris coming through and may have contributed to flooding downstream.

Many road drains also became blocked during the event, as debris was swept in from the surrounding area and from damage to roads and property. The high volumes of water also overwhelmed the drainage system – they are not designed to cope with an event of this unusual intensity

Areas where detail is known:

At **Snowdon Heights**, some properties have been flooded externally, or placed under threat of flooding, by considerable surface water flows coming down the hill to the west of Chard. Flows progress down Cotley Lane, some go down the High Street, and some cross the field and impacts houses on Snowdon heights. Local topography will make this difficult to tackle effectively. It was reported that gullies were blocked prior to the event particularly on Cotley Lane. Again, these drains would have been overwhelmed by the sheer volume of water had they been clear and free running.

At **St Marys Close**, surface water ran across fields and into houses and gardens. It mostly came through a hole in the hedge adjacent to 29A St Marys Close in which water runs off from the adjacent fields and directly onto the highway. It was reported that the bungalows in the central block of the Close were most badly affected, but specific numbers and addresses were not provided. The properties shown as flooded on the map are a 'best guess' taking the topography into account. Previous flooding led to a recommendation to install a flood alleviation feature approximately across the back of numbers 21 to 28 St Marys Close. During

a site visit, it was found that a breach in a bund at St Marys Close allows flows to enter the road. During the site visit, a local resident reported that the breach had been cut to mitigate the risk of flood waters overtopping the bund and spilling into the properties behind.

**Laurel gardens** - the bridlepath has been identified as a flow path for surface water emanating from farmland. There are four relatively new highways gullies in situ, but they appear to have been overwhelmed during the incident by the sheer volume of water. These gullies have been seen by residents to function appropriately during normal and severe events.

The area around **Furnham Road Industrial Estate, Beeching Close Industrial Estate** and Chard reservoir saw extensive flooding. The businesses in Furnham Road Industrial Estate were flooded internally. It is uncertain whether certain units in Beeching Close were flooded internally or externally. Local topography drains water down Furnham Road, and also across Glynswood and down Furnham Road, into this area, meaning that water entering this area has originated from rural hills to the west and north. There is also considerable overland flow from Coker Way, a residential area adjacent to Furnham Road Industrial estate. This area is hydrologically complex due to the presence of the reservoir, the remains of the old Chard canal and the decommissioned railway, a piped exit from an old sewage works, no longer in use, and a high groundwater table, as well as private drainage from the industrial estate.

**Cuttesford Door** is an area where surface water flows off the surrounding hills to cause flooding. Issues with highways drains were reported here.

**Crimchard** had large amounts of stones swept onto the highway by the force of the water. Surface water sweeps into Crimchard mainly from the Catchgate Lane area, having come down from Wadeford and Foxdon Hill.

**Silver Street**, in Chard town centre, experienced fairly deep flooding, blocking/entering the access to a block of flats and the neighbouring Red House. This area is a low point in the local topography, and the entrance to the flats is lower than the road. Water ran into this area from all sides, both down the high street and from the south west.

In **Glynswood** there is a length of open channel across the school grounds, which then continues through a trash screen and then into a culvert. It was reported that

the trash screen became blinded with debris during the storm incident and may have caused water to back up, flooding part of the open space adjacent to Academy and leisure centre. The condition of this culvert is not known, and it apparently runs into the sewerage system. Surface water drained into this area from Elizabeth Way. Responsibilities here are complex and not firmly known and the potential divided responsibility may make solving the flooding problems here tricky.

Another property in Glynswood reported flooding to a height of about 2 feet against their back door, and surcharging from the foul sewage manhole cover in their back garden.

On **Bews Lane**, near the Redstart School, there was a flow of water along the road and across the school site. It was reported that there is a drain, culvert, or similar structure just off Bews Lane which may have been blocked and/or overwhelmed by the amount of water.

At **Millfield** a property was flooded internally as a result of water flowing in a North bound direction around the bend just prior to the Chard Police Station.

[Link – photographs from Chard](#)

People living in Mill Lane, Bryer Close, Furnham Close, Alun Rees Way, Furnham Road, St Mary's Close, Bewley Court, Wadeford Hill, High Street, Gillingham Court, Coker Way, Glynswood, Oak End Way, Lower Touches, Crib Close, and Furzehill were all affected.



**Figure 5: Flooded properties in Chard**

[Link: Photos from Wadeford](#)

[Link: Flooded properties in the villages and outlying areas.](#)

Several properties in **Nimmer** flooded, mostly around the tributaries of the River Isle which runs through the village. Again, the main flooding mechanism in Nimmer, as reported by the Parish Council, was the overland flow of surface water from nearby fields to topographical lowpoints. Residents near the river explicitly stated that they were flooded from overland flow, not from the river rising. Blocked drains and the blocking of a culvert have been implicated as contributing to the problem, as water could not flow away effectively. It was stated that the culvert was installed by 'the council' (it is not clear which one) in 2009, and that residents are constantly having to clear it out. However, the engineer for the installation stated that a culvert had been installed in the late 1990's under MAFF Grant Aid. It should

be checked whether there are one or two culverts and whose responsibility they are. Gullies in the area were reported as not draining, and may have been blocked, or overwhelmed by the amount of water. There is also a stream in the area which has become overgrown and needs clearing.

The Lane to **Nimmer Mill** was flooded. There is a SCC flood alleviation scheme there which many have been bypassed or overwhelmed. Highways have agreed to place a 'sleeping policeman' type of installation to try and divert water away, but this is not yet in place.

Several houses were flooded in **Wadeford**, and **Combe St Nicholas**. The houses flooded in Wadeford were all near where the River Isle runs through the village. The main mechanism of flooding in Combe St Nicholas, according to Parish Council reports, was surface water running downhill off nearby fields, and down Wadeford Hill / Combe Hill. They also reported that a small watercourse in the centre of the village rose in level, and that some properties were affected by both flooding mechanisms. The properties in Wadeford were affected by runoff across farmland on surrounding hills. The village is at a topographical lowpoint.

In **Wadeford** the road flooded outside Goblin Hollow. The culvert was reported as being partially blocked. They also reported that gullies outside are either damaged or have been buried within the access road. During the flood there was a sudden rise in water level in Wadeford, and this has led to allegations within the village that it was linked to the breaching of containment of a series of ponds of fairly recent construction.

**Wadeford** around Court Mill Lane has a system of mill streams, leats, and sluice gates. Houses around Court Mill Lane were badly flooded, with water reaching above window sill height. These mill structures extend downstream into Pudleigh. The sluice owner at Pudleigh reported a collapsed culvert.

The Haymaker pub in **Wadeford** was also reported as being flooded– it was reported that surface water came straight from the field opposite, onto the road and down the eastern side of the pub, into the car park. From here it flowed through the gardens of the houses to the north. Surface water also flowed straight into the pub via the side entrance. There is a small drain there which crossed under the road which was working but it exceeded capacity.



Properties that were flooded in **Forton** are situated next to the Forton Brook. Reports identified the flooding as coming largely from surface water runoff from across neighbouring fields. There was some flooding from the brook, and culverts were raised as an issue, though it is unknown if these were blocked or acting as a pinch point in waterbodies over capacity. The flood also acted to scour the bridge and deposit the debris from this in the watercourse. A resident observed a general rise in water levels in the Brook over the past few years.

Several houses in **Tatworth** were flooded in the region of Fore Street, near the Loveridge Lane junction. Residents observed that water entered around the back of the houses, after running overland across the field to the West and North. A Parish Councillor reported seeing manhole covers which had been lifted by the force of the water, and that the profile of the road had been changed by the force of the water. Councillors went to the watercourse the day after and saw a lot of rubbish along the banks. Some of this was cleared by SSDC Land Drainage team.

In **Wambrook** three properties were flooded, but residents did not give information on likely flood mechanisms. They are, however, all next to the Brook, so a fluvial source is likely to be at least a part of the source of flooding.

There have been no reports thus far of houses flooding in **Whitestaunton**, but there have been reports of extensive road damage. This has apparently resulted from the force of the overland pluvial flow down White Ash Lane and Mill Lane.

In **Lower Coombes**, Parish Councillors reported that 20 houses in the village were flooded and one had a toilet back up.

A rapid rise in level was reported in the Forton Brook which runs behind the majority of the affected properties, and it was observed that this is where most of the water which affected properties came from. Parish Councillors, who were out on the night, reported that the water seemed to be running off fields, towards the brook, which was also rising, leading to some people getting hit from both sides.

The Parish Council have also stated that Highways gullies required clearing. On Waterlake Road there is a culvert which became blocked during the event. It was reported that pressure build up caused the culvert to partially collapse and create a 3 foot hole in the road, and that water had been running across people's property rather than down the usual path of the stream ever since. Concerns have also been

raised about farming practices in the area and the growing of crops which allow/encourage large amounts of runoff.

In **Scrapton lane** two houses were affected and the road surface badly torn up. Videos submitted by residents show a huge volume of water rushing down Scrapton Lane with tremendous force. This apparently came off surrounding fields. It was reported that there is a possible blocked culvert here, and that drain gullies required clearing. There is also an open drain/watercourse of unknown ownership which is not marked on the maps.

[Link: Photos of road damage](#)

In **Chaffcombe** it was reported that the main problem is that they are at the bottom of a very wide hill, and that the flash flood water rolled down the hill from two directions and joined at the junction of the village where it completely overwhelmed the drainage system. The drainage in the village is reported to be many years old.

In **Cricket St Thomas, Winsham** parish Council reported that some houses had been flooded, but not specifically which ones.

<p>Catchment Area</p>	<p>Chard sits at the edge of the Blackdown Hills. The natural path of surface water is down from the hills to the west of Chard, into central Chard, and then down to the low point at Chard Reservoir via Furnham Road and Beeching Close. The reservoir overflows into the River Isle to the east of the town. Surface water from the areas of Combe St Nicholas, Wadeford and Nimmer run down into the River Isle. South East Chard, Wambrook, Higher Wambrook, and Coombses/Tatworth/South Chard areas sit in a different catchment – that of the River Axe – and surface water from there will run into the brooks and away to the Axe.</p> <p>The only ‘main’ river is a stretch of the Isle, down through Knowle St Giles into Chard Reservoir. A main river is classed as a river for which the Environment Agency is responsible in terms of flood risk. A flood warning was issued for this stretch, but it has not been implicated in any property flooding. The rest of the waterbodies in this report will be ordinary watercourses. These are under the responsibility of riparian owners (those who own the land the river flows through) unless there is a legal document or agreement stating otherwise. There are no flood warnings for ordinary watercourses, or indeed for surface water movement.</p> <p>The area is not covered by an Internal Drainage Board (IDB). An IDB is a public body that manage water levels in an area, known as an internal drainage district, where there is a special need for drainage. IDBs undertake works to reduce flood risk to people and property, and manage water levels for agricultural and environmental needs within their district.</p>
<p>Historical Information</p>	<p>District Council records are time limited. Historic flooding episodes are listed in the appendix: Wadeford and Combe St Nicholas in particular have a history of flooding.</p> <p><a href="#">Historic</a></p>

Highways  
Drainage  
Assets

The drainage assets of concern here are the gulleys in the road and their connecting drainage pipes, plus any culverts and connections to the sewerage system, soakaways or surface water bodies. The local authority keeps records of drainage under their care, mostly belonging to the Highways Department. Private drainage is not generally recorded. The drainage network around the affected areas is extensive, as figure 36 shows. However, significant problems with draining the accumulated rainfall during the incident have been noted by many parties.

For the most part, this is due to the severity of the rainfall – during a flooding incident, it is very difficult to tell if a gully is blocked, or if it just being overwhelmed by the sheer volume of water. Some gullies reported as blocked by residents could have been due to this overwhelming effect. In a site visit after the event, scouring was visible along flow paths, providing evidence that sediment loading and deposition was taking place. Further investigation of the drainage system would be required to ascertain the exact problem in each location. The examination and, where needed, clearing of gullies needs to be improved.

Current design standards for highways drainage require drains to cope with a 1 in 5 year event plus 20% allowance for climate change, and that a 1 in 100 year event not exceed the bounds of the highway. This event was a 1 in 300 year rainfall event. Drainage meeting this standard would not have coped with the intensity of rainfall during the flood event, and would have overflowed or failed to drain all the water away even without any obstruction.

When a new housing estate is built, planning policy states that the outflow from any surface water collection system should not be greater than the volumes of water which flowed from that site as a green field.

However, these standards only apply to modern sites. Previously, housing and highways drainage were built on principles of coping with average rainfall, and were designed for the rainfall levels and groundwater levels of the time. With the action of climate change over the years, many of these installations are no longer adequate for even average rainfall, let alone the 1 in 300 year event that occurred on 28<sup>th</sup> June.

Blocked drainage gullies were an issue on the night. In part, this is fairly inevitable during a storm situation, as much of the debris blocking the gullies has been washed into place by the storm itself. However, there were also places (Holyrood

Highways  
Drainage  
Assets

Street (Eastern End), Old Town, Church Street and Forton Road in Chard, Lower Coombes, amongst others) where it was observed that drains were not draining during the incident. This could be because they were blocked, or it could be that they were simply overwhelmed by the volumes of water and not able to get all of it away. There are also reports that gullies have been cleaned out, but that the drainage pipes between them were blocked.

Blocked surface water drains typically contribute more to flood risk during small events than large ones. This is because during small events the flow capacity of the drainage system might represent a significant part of the flows reaching the town. However, in larger events the capacity of the drainage system is likely to be a lot smaller than the flows reaching the town. This means that the drainage system would be expected to make a smaller difference during a large flood event, even if the drainage system was maintained in perfect condition.

There are places where there appear to be gaps in the council record of the gully network, for instance, around the [Furnham Road](#) industrial estate, around the Holyrood [Academy Campus](#) in Chard, large areas in the very centre of [Chard](#), and the centre of the village of [Forton](#). This may be because there are private gullies in place (as there are in Furnham Road Industrial Estate), or this could be an issue with the completeness of council records.

All the flow routes in the North East Catchment are likely to contribute to flood risk on Furnham Road, especially at the northern end. LiDAR evidence indicates that the northern end of Furnham Road is one of the lowest points in Chard and that there is a slight dip in this location. It is therefore likely that this area acts as a conduit, and as a basin for most of the overland flows which pass through the catchment and are not collected by below ground drainage systems. Somerset County Council commissioned a CCTV survey for a private surface water drain in Furnham. The drain was short, and the inlets to it served small, well-defined areas of hard standing. However, this survey found high flows in the drain on a day when it was not raining. This may be evidence of groundwater ingress to the drainage system. The survey observations are supported by geological information. Borehole evidence shows that, in parts of Chard, sands gravels and sandstone (which are typically permeable) are underlain by clay (which is typically impermeable). This could lead to perched groundwater, where water drains into the ground rapidly but is prevented from escaping. While no evidence has been found

of groundwater being a direct cause of flooding, it is likely that groundwater reduces the capacity of surface water drains, which contributes to flooding from other sources.

Certain culverts have also been highlighted as potentially contributing to flooding, as they were reported as become blocked or damaged during the flood event, or to have created a bottleneck for flowing water. There are a lot of culverts under and around Chard, many of which are not entirely mapped, and their precise locations and condition are unknown. This includes culverted watercourses running from Mitchell Gardens to Millfield, another to the south of Millfield, from Glynswood to Furnham Road area, and another approaches Furnham Road from the south. There is a wide and varied network, some have been lost due to building works, and owners may not be aware of their responsibilities.

Modelling undertaken as part of this investigation indicates that flows are unable to enter the Glynswood Culvert during large storms (primarily due to the capacity of the inlet), causing water to back up in the upstream watercourse and eventually overflow on to Glynswood. When this occurs, the model shows overland flows extending through residential areas towards the A358, contributing to highway and property flooding. This is supported by reports from residents. However, the same modelling, also indicates that overland flows from the south and north also contribute significantly to flooding in this area.

One way in which different sources of flooding interact in Chard is at the head of culverts. Water that spills from the head of a culvert is often unable to get back into the culvert system which means it joins with overland flow routes from elsewhere. The modelling undertaken for this investigation indicates that this happens at the head of the Glynswood culvert (as described above) and where open channel sections of the Furnham Road Culvert discharge back into pipes. At the head of the Glynswood Culvert this is also supported by descriptions of historic floods from local residents.

The risk of flooding from multiple, interacting sources is particularly high at the northern end of Furnham Road. In this location, it is understood that three culverted watercourses meet each other. Additionally, the model shows overland flows from the southern end of Furnham road meeting overland flows from the

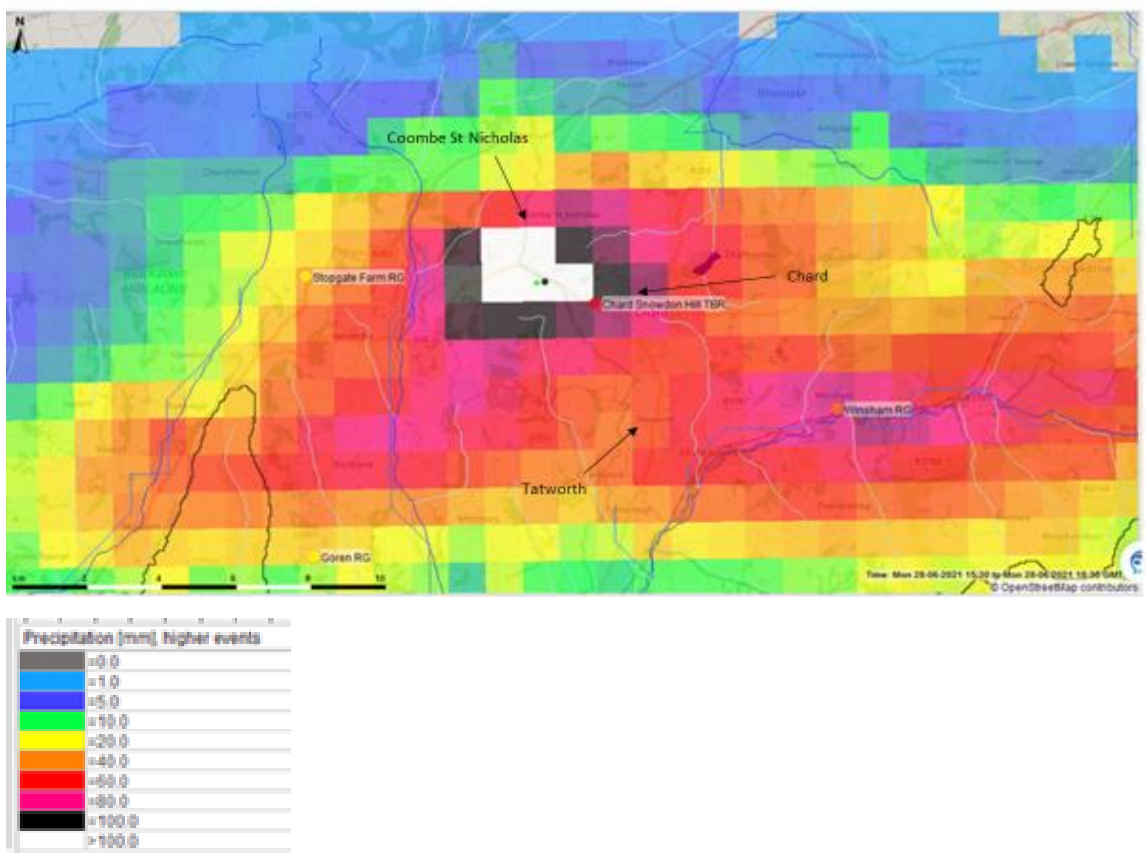
	<p>land to the north west. There are also indications of high groundwater in this location, which could be contributing to flood risk.</p>
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<p><b>Water Company Drainage</b></p>	<p>Surface and groundwater can also drain into the combined sewer system. Some older properties have their surface water drainage (usually from roofs and downpipes) connected into the sewage system. Surface water can potentially enter the system via holes in manhole covers, and there were reports during the event of people lifting sewage system manhole covers to try and get accumulated water to drain away. These factors would have acted on the night of the incident to fill and potentially overwhelm the sewage system.</p>
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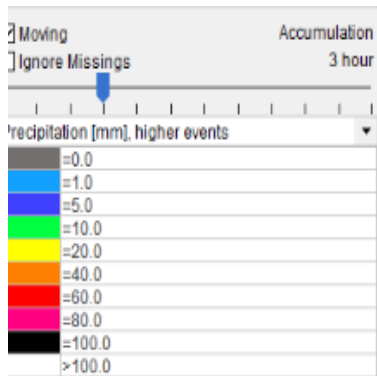
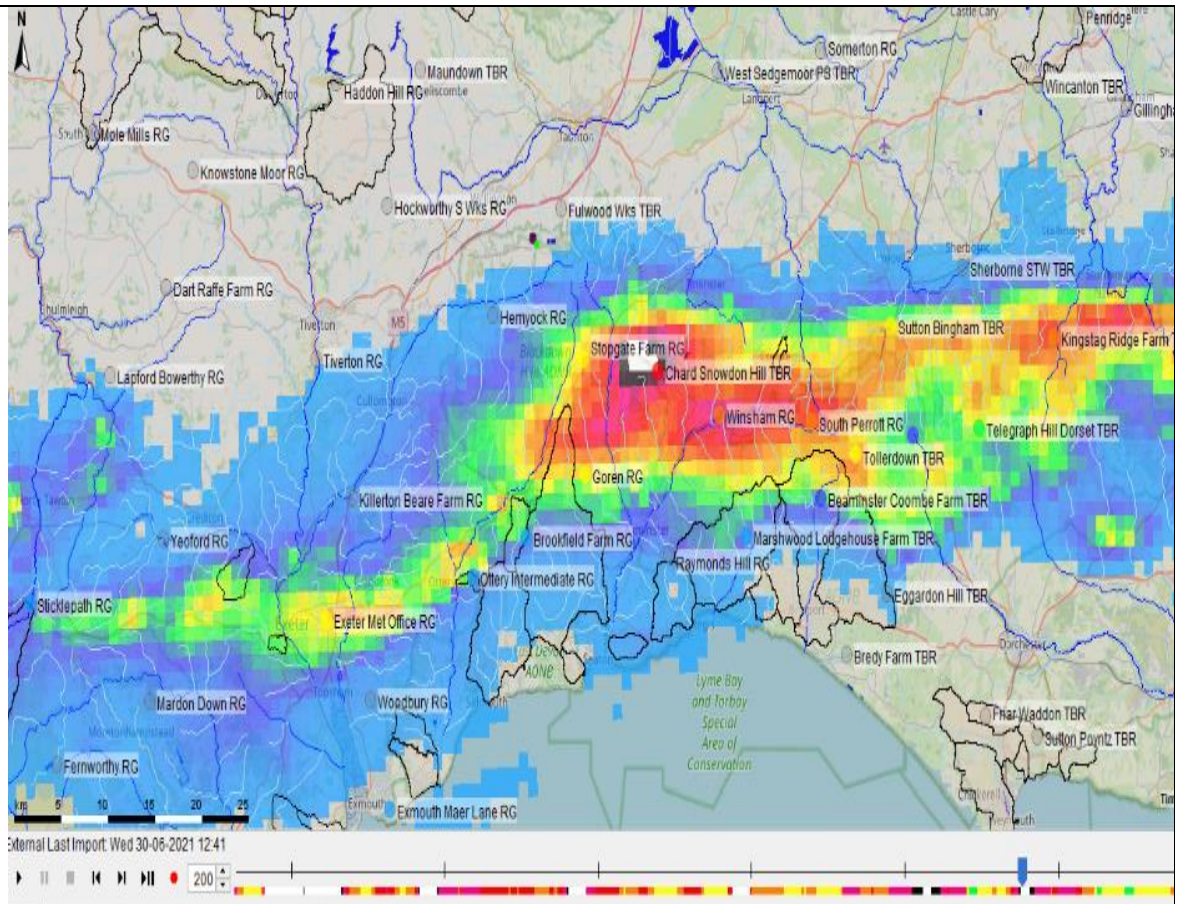


Rainfall  
Information

The rainfall in the study area during the June event was extremely severe. This was the sort of quantity and intensity of rain that has a 0.3% chance of happening in any one year, based on past rainfall figures. Officers on the ground in Chard during the event commented that the rainfall was so intense that visibility was down to about 5 yards, and that it was 'like working in fog'. Emergency services working in Chard were unable to cross the central area around High Street and Furnham Road, and had to set up control points on either side of Chard to enable them to get to everyone affected.



**Figure 6: Rainfall radar showing cumulative rainfall over Chard, Monday 28<sup>th</sup> June 2021, 15:30 to 18:30. The white area indicates rainfall of over 100mm in the 3 hour period.**



**Figure 7: Rainfall radar showing cumulative rainfall over a wider area, Monday 28<sup>th</sup> June 2021, 15:30 to 18:30.**

Figure 7 shows the location of the rain gauge at Chard Snowdon Hill. This recorded 32mm of rain in the 24 hours immediately before the event. The maximum rain recorded at Chard was 95mm in 2.5hr, between 5pm and 7:30pm BST on 28<sup>th</sup> Jun 2021.

A private rain gauge recorded 50mm in 2 hrs at Chardstock.

Below is an excerpt from EA Monthly water situation report for Wessex:

“The first half of June was dry, followed by two main periods of rainfall over 16 – 21 June and 24 – 28 June, when 43% and 51% of the month’s rain fell respectively. The majority of south catchments received ‘above normal’ rainfall. Cumulative rainfall since the start of the water year (October 2020) remains high at 117% LTA.”

Rainfall for the catchment including Chard was at 144% of long term average rainfall for June, and had been consistently at above normal levels for the last 12 months. The nearest river flow gauging station, on the River Isle at Ashford Mill, had flows at 170% of long-term average for June. Although this was not directly implicated in the June flooding event, it gives some idea of the volumes of rainfall around at the time.

It is difficult to overstate just how extreme an event this was. The flood maps we are used to looking at from the Environment Agency show an intensity of rainfall with a 1% chance of happening in any one year. This event has a 0.3% chance of happening in any one year. As against the 1 in 100 year maps, the areas that flooded during this incident were more extensive, and flooded to a greater depth. The sheer size of this event makes it difficult to propose solutions that would completely cope and totally prevent flooding when an event of this magnitude happens again. It is possible to mitigate, it is possible to have an impact, it is possible to make future flooding ‘less bad’, but on the rare occasion that that this volume of water falls from the sky again, there will inevitably still be flooding.

<p>Surface Water</p>	<p>Most of the flooding seen around Chard and surrounding villages during the event was due to heavy rainfall gathering and moving across the land – this is usually referred to a pluvial or surface water flooding.</p> <p>The basic mechanism appeared to be the movement of overland flow downhill, and as the centre of Chard and most of the surrounding villages are in valleys, heavy flooding was experienced in <a href="#">these</a> topographically low areas. Chard suffered particularly as it is in a wide valley with considerable hills either side, forming a large ‘bowl’ effect. There are also low areas within Chard, particularly around Furnham Road and Millfield. These attracted considerable amounts of surface water runoff.</p> <p>Flows in transit also caused significant flooding and damage to roads and property, blocking drains in the process.</p> <p><a href="#">Link: EA Surface water flood risk mapping.</a></p> <p>The area affected was more extensive than shown in the EA surface water flooding map shown – this map illustrates the extent of flooding with a 1% chance of happening in any one year, as opposed to the 0.3% chance of the 28<sup>th</sup> June event.</p>
<p>Fluvial</p>	<p>The study area has a network of smaller streams and drainage ditches, as opposed to main rivers. Many of these watercourses are under riparian ownership. In several areas these watercourses were directly implicated by residents in flooding: In Lower Coombses some properties near the river were caught between rising surface water on the lane at the front, and a rising brook behind their houses. In Wadeford, Nimmer and Lower Coombses, public comments were made that watercourses had not been properly kept clear, reducing capacity to convey water. Anecdotal evidence suggests that many riparian owners are unaware of their rights and obligations with regards to their watercourses.</p>
<p>Coastal</p>	<p>There is no risk of coastal flooding in this area.</p>

<p><b>Groundwater</b></p>	<p>Most of Chard is on bedrock of sandstone (the Upper Greensand Formation), apart from Furnham Road and the associated industrial estates, which are on mudstone. Borehole logs indicate a layer of clay beneath the greensand. There are also shallow deposits of mixed clay, sand, and gravel. Upper Greensand is porous and will absorb water, however mudstone will not. The shallow sands and gravels will variably absorb water depending on the percentage of clay it contains.</p> <p>The effect of this layering is that rainwater will absorb into the ground in most of Chard, down to about 120 feet. This generates a layer of fairly shallow groundwater, which generally responds quite quickly to rainfall with a rise in groundwater level. In the Furnham Road area, the presence of mudstone nearer the surface means that rain is poorly absorbed, only really into the overlying thin layer of sands and gravels, and as such rainwater cannot locally 'get away' as easily. It is much more likely, once the sands and gravels are saturated, to combine with surface water to form significant overland flows, of the kind seen entering the Furnham Road industrial estate.</p>
<p><b>Soil Moisture Deficit</b></p>	<p>Soil moisture deficit is the difference between the amount of water actually held in the soil, and how much water the soil can hold. A low soil moisture deficit means that the ground is almost saturated and cannot readily absorb more water. For the Chard catchment in this time period was in the region of 11 to 40mm. This is between 26 and 50mm below the long term average, so even though there had been considerable spring rainfall, when the flooding incident occurred, the soil was still fairly dry. As such, some of the rainfall from the event would have been absorbed into the soil.</p>
<p><b>Risk Management Authority Responsibilities</b></p>	<p>The Flood and Water Management Act places a duty on all flood risk management authorities to co-operate with each other, to ensure flood management activities are well co-ordinated, and work in partnership to reduce the severity and impact of flooding.</p> <p><a href="#">See Appendix</a></p>

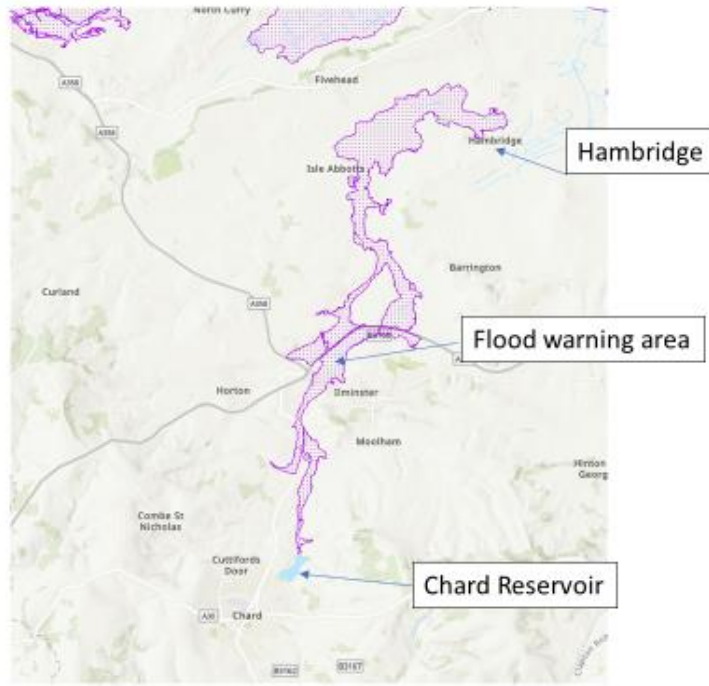
<p>Risk Management Authority, Incident Response Agency, and Stakeholder Actions During And Immediately After The Event</p>	<p>Somerset County Council (in their roles as LLFA and Highways Authority)</p> <p>Highways Authority:</p> <p>Had no direct responsibilities on the night. They exercised their statutory duty by:</p> <ul style="list-style-type: none"> <li>• 3x Highways Superintendents inspecting and where necessary actioning defects and/or formalising road closures.</li> <li>• 4x safety gangs assigned to this area to respond Highways Superintendents requests.</li> <li>• Scrapton Lane, Combe St Nicholas, roads in Whitestaunton, and Court Mill Lane, Wadeford, were closed as impassable.</li> <li>• Major clear up required in Whitestaunton. Resource was assigned to this task rapidly.</li> <li>• 1x SCC (Milestone) sweeper operational in Chard area. Considerable debris to be removed from the carriageway across the area. Temporary use of the Chipping landing on the nearby A30 (Windwhistle – north of Chard) approved to deposit arisings.</li> <li>• General clearing of mud and debris from roads.</li> </ul> <p>They also sent street cleaners through Chard the following day to clear up road debris</p> <p>In the following days they assessed and prioritised work to rebuild the damaged roadways, and began a programme of works to rapidly bring the damaged roads back into use.</p> <p>LLFA: commissioned section 19 and began to gather information from residents and other RMAs about their activities, and when, where and how flooding occurred.</p>
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Risk Management Authority, Incident Response Agency, and Stakeholder Actions During And Immediately After The Event

**Environment Agency**

Fulfilled their statutory duty by issuing flood warnings for main rivers as follows:

DATE	AREA	CODE	WARNING / ALERT AREA NAME	TYPE
28/06/2021	Wessex - North	112WAFTSSR	South Somerset Rivers, Upper Reaches	Flood Alert
28/06/2021	Wessex - North	112WAFTSES	South East Somerset Rivers, Upper Reaches	Flood Alert
28/06/2021	Wessex - North	112FWFISL10A	River Isle from Chard Reservoir to Hambridge	Flood Warning



**Figure 8: Flood warnings**

None of the flooding in or around Chard has been traced to a main river, although non-main river watercourses have been implicated.

**Wessex Water**

Took 12 calls on the night. Mostly due to external flooding but one was due to the internal flooding of a property. The calls were mostly for blocked and backed up sewerage systems. They fulfilled their statutory duty by having two crews out working to deal with sewage incidents. Crews came back to affected properties the next day to follow up and complete works as needed. Wessex Water reported that their main issues were in Furzhill and Glynswood where pluvial flooding was inundating the sewers.

<p><b>Risk Management Authority, Incident Response Agency, and Stakeholder Actions During And Immediately After The Event</b></p>	<p><b>Somerset Rivers Authority (SRA)</b></p> <p>Community engagement officers do not have statutory duties, but they assisted partners by supporting the LLFA in managing public correspondence and providing info and support to parishes around property resilience.</p>
	<p><b>Devon and Somerset Fire and Rescue Service</b></p> <p>Fulfilled their statutory duty by taking charge of the emergency and responding to calls for help from the public.</p> <p>Twenty two calls were reported by 7:30pm and they were deploying high capacity pumps to pump out houses at this point in time.</p> <p>Took 90 calls overnight. They had to prioritise calls where life was at risk due to the numbers needing help.</p> <p>Set up two forward command points, because Chard itself could not be crossed safely – one at Honiton and one and Chard Fire Station. Each dealt with incidents on the half of Chard accessible to them. Multi-agency representation was present at both command points, so these effectively operated as ‘gold control’. In general, very good communications were reported between the Fire Service and the District Council.</p> <p>Returned to normal control/methods at 1:30am on the 29<sup>th</sup>.</p>
	<p><b>Civil Contingencies Unit:</b> <b>(Partnership between SSDC and SCC)</b></p> <p>Report from Duty Civil Contingencies Officer:</p> <p>The Duty Officer was aware of incoming rainfall. They received a phone call from the Police at 7:30pm on the 28<sup>th</sup>. Their first duty was to ensure there were places of safety for the public, to which end they opened The Guildhall as a refuge. In the end no-one needed to use it as a refuge, but it was a useful base for distributing sandbags and generally co-ordinating their efforts. A multi-agency meeting was held at 9:45pm on the 28<sup>th</sup>.</p> <p>Contingencies Officers reported that rain happened very quickly and overwhelmed the highways piped drainage system. Officers also reported that residents were calling all sorts of agencies to try and get help and find out what</p>



<p>Risk Management Authority, Incident Response Agency, and Stakeholder Actions During And Immediately After The Event</p>	<p>was happening, which reduced the ability to co-ordinate centrally. Sandbags were available, and the Town Council were advertising their availability on Facebook.</p> <p>Officers identified a wider and more strategic issue with Chard being on the edge of the county and all the civil contingencies equipment being held more centrally. The CCU have since been talking to other agencies and community members about community resilience arrangements, supporting Parish Councils with the development of community resilience plans, and developing grant applications for resilience equipment.</p> <p>Officers fulfilled their statutory duty by assisting partners and the public during the incident.</p>
	<p><b>South Somerset District Council:</b></p> <p>Opened the Guildhall as a place of respite for affected residents, and as a general co-ordination and recovery centre. The duty officer also went to a co-ordination centre set up by the Sainsburys at the crossroads.</p> <p>Two locality officers were out on the night and took gel sandbags over to the Guildhall for wider distribution. Officers fulfilled their statutory duty by assisting partners and the public during the incident.</p>
	<p><b>Avon and Somerset Police</b></p> <p>Reported in incident to the Duty Civil Contingencies Officer at 7:30pm.</p> <p>Reported that there was flooding in the High Street and Furnham Road. That there was water in the houses in the High Street and they were helping people to move upstairs. They were closing the main route through town.</p> <p>There was a further operational multi-agency call phone call around 7:30pm, at which point the incident was downgraded from 'major' to 'significant'.</p> <p>Officers fulfilled their statutory duty by assisting partners and the public during the incident.</p>

<p><b>Risk Management Authority, Incident Response Agency, and Stakeholder Actions During And Immediately After The Event</b></p>	<p><b>Tatworth and Forton Parish Council</b></p> <p>At Tatworth:</p> <p>Councillors delivered sandbags to the village, sourced from the Town Hall. Helped residents (some very elderly) upstairs to safety.</p> <p>Councillors assisted in getting debris from the flood cleared from people’s property.</p> <p>At Lower Coombses:</p> <p>Councillors were out on site at Coombses helping people upstairs to safety.</p> <p>Councillors reported that 20 houses in the village were flooded and one had a toilet back up.</p> <p>Councillors who were out on the night reported that the water seemed to be running off fields, towards the brook, which was also rising, leading to some people being affected by both flooding mechanisms.</p> <p>Parish councils do not have statutory duties.</p>
	<p><b>South West Water</b></p> <p>Information about their activities on the night have been requested but not received.</p>
	<p><b>Chard Town Council</b></p> <p>Councillors were available on the night, helping local residents. They were out clearing drains that were blocked, these were in Church Street, Old Town, Holyrood Street and Millfield.</p> <p>On 24<sup>th</sup> January they hosted a multi agency drop in event at the Guildhall in Chard.</p>

<p><b>Flooding Mechanism</b></p>	<p>Examination of flow paths of rainwater and information from local residents and site visits has established several probable causes for flooding, acting together in different parts of the area.</p> <p>The essential issue is that Chard sits in a bowl in the hills (see <a href="#">topographic map</a>), and rainfall runs off the surrounding farmland and into the streets of Chard.</p> <p>To the West of Chard there is a large area of farmland on the edge of the Blackdown Hills with a considerable slope to it. Examination of flow paths has shown that rainfall runs off these slopes at some speed and enters the town via roadways and paths to the west such as Touchstone Lane and Crimchard.</p> <p>To the north of Chard, the topography acts to funnel runoff water down Furnham Road. This comes with sufficient speed to bring rocks and debris, causing further issues with keeping drains etc clear. This also spills over into roads such as Furzehill, causing additional flooding.</p> <p>The main issue across Chard is surface water running across the town, picking up speed, more water, and debris as it goes.</p> <p>In Glynswood surface water runs down into a brook which runs through the open space near Holyrood Academy. This brook enters a culvert to run under properties at the eastern end of Glynswood and enter the drainage system. This culvert is a potential bottleneck for flows, especially if it becomes blinded.</p> <p>Furnham Road industrial estate presents a complex and multi-layered issue. There are issues with surface water runoff and drains not clearing. Photos and video taken during the flood show significant amounts of water entering the estate overland from the adjacent housing estate, around Coker Way.</p> <p>Issues in the Millfield industrial estate are also believed to be due to inadequate capacity in an intermittently culverted watercourse.</p> <p>During the site walkover, a series of bunds were identified along the west end of Crimchard, (at the bottom of the agricultural land and above the first row of houses). The owner of the farmland identified these as being part of a historic surface water management system. However, breaches of these bunds were identified during the walkover, which appear to have been made by the owners or builders of the houses to accommodate development on their land. These breaches might have changed flow paths locally and could have increased flood</p>
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risk to properties. Many properties in the Crimchard Catchment also have low door thresholds relative to the highway.

The design specifications of the drainage systems in Chard and surrounding villages are currently poorly understood. Many are very old and not up to modern standards for coping with above average rainfall. Many gullies were reported as being blocked; however they would not have coped with an event of this intensity, and many could just have been overwhelmed by the volume of water.

Foul drainage system: Some drains which are apparently surface water drains actually connect into the sewerage system – either due to mis-connections, or because in properties of a certain age, this was the standard method. This type of connection was, in certain areas of the UK, used up until the 1970's. On the 28<sup>th</sup> June, people were lifting drain covers in the foul system to try and get water to flow away. However, as this water moved through the system under gravity, it resulted in manhole surcharging and more flooding at the Furnham Road end of town. Wessex Water reported that on the night the main issues were in Furnham and Glynswood, where pluvial flooding was inundating the sewers, and then causing the sewers to surcharge. Together, this points to a sewage system being overwhelmed with rainwater, causing it to surcharge.

Flooding mechanisms in surrounding villages were not dissimilar. High volumes of water flowed down sloped roads in Combe St Nicholas, Wadeford, Scrapton, Wambrook and Higher Wambrook. Lower lying areas such as Nimmer, Tatworth and Lower Coombses received a lot of this water, which collected at low points, and were also threatened by rising water levels in brooks running through the villages.

Modelling of flood flows in Chard has provided a map of the likely water movement during the event, which corresponds with reported experience on the ground. The map below (figure 9) is representative of a 1 in 375 year rainfall event, and so is somewhat more severe than the 1 in 300 event experienced. However, the flow directions seem to hold true, even if the extents of flooding shown are a little greater than what actually occurred.



***Figure 9: Model mapping of 1 in 375 year rainfall event and resultant fluvial and surface water flooding.***

Recommendations

The intensity of this event makes adaptation and mitigation challenging. It is difficult to mitigate against this type of severe weather event purely with civil engineering – it was extensive, with significant intense rainfall and with different flood mechanisms for each of the communities. Just building higher defences and bigger drains will not be enough, a more creative and sustainable programme of measures is needed.

In Chard itself, local topography and historic road/ town layout is a contributing factor to the flood mechanisms, as is drainage capacity.

Catchment topography in the villages is highly significant, as well as old watercourse systems which have limited capacity and cannot be readily altered.

Riparian responsibilities need to be understood at the community level and appropriate emergency planning and property level flood protection measures need to be in place. There is much opportunity in the upper catchment to slow flows and intercept and redirect pluvial flows. This can make flooding 'less bad', and reduce road and property damage and hazard to life by slowing the speed at which the water arrives from surrounding high areas. But communities need to recognise that there will always be flood risk in certain areas of Chard and the surrounding communities. However we construct drainage and flood defences of any kind, they will always have their limits.

As we now know that the centre of Chard is not readily crossable during a flood event, civil contingency operations should prepare for having control centres on either side of Chard. This should include having two safety centres for the public, two places from which to distribute sandbags and other temporary property level flood protection devices, and two control points for emergency services.

The net of who to include in the multi-agency calls and civil contingency co-ordination needs to be cast wider. Parish Councils in particular were very active during the event, but were not on the multi-agency call and were out of the loop. Water companies were also not included.

There needs to be a better conduit for public contact during events. The public were reported as contacting a variety of agencies, creating confusion and inefficiencies. Civil contingency bodies should consider having, and publicising, a

single point of contact for non-life threatening situations which can then be referred to the appropriate bodies for action.

SCC Highways are currently auditing their gully and drain cleaning management regime to see what improvements can be made.

Work is currently ongoing to identify flood mitigation measures which can be installed around Chard and surrounding areas – items such as flood storage basins. This work is to be continued. It should be expanded to look at natural flood management measures such as ‘slow the flow’ and reconnecting rivers and flood planes in more appropriate and less damaging locations.

Work on the area around Furnham Road should continue, to develop appropriate drainage and flood mitigation schemes.

The source of the sudden rise in water level in Wadeford should be investigated. If this was down to a containment breach or similar, as is alleged locally, the landowner should be advised on appropriate reinstatement or alternative measures.

A protocol should be developed for the mill and sluice gate owners on the River Isle near Wadeford and Pudleigh so that they act in a co-ordinated way to minimise flood risk during flood events.

There have been concerns in Lower Coombses about the crops being grown in the area creating high levels of runoff. Engagement should take place with the community, FWAG and local farmers on this issue.

The following culverts, gullies and other assets need to:

- Have their owner identified or confirmed.
- Be checked for damage or blockage.
- Be repaired and/or cleared as necessary.
  - Flood alleviation feature at the back of St Marys Close, Chard.
  - Culvert and trash screen in the open area in Glynswood.
  - Drain or culvert on Bews Lane.
  - Culvert in Dellshore Close.
  - Culvert(s) in Nimmer, reported as being installed by the council in 2009, and/or under MAFF funding in the late 1990’s.
  - Culvert and gullies near Goblin Hollow, Wadeford.

- Culvert around the junction of Wadeford Hill and Court Mill Lane, Wadeford.
- Drainage pipes around the Haymaker Pub, Wadeford.
- Culvert on Waterlake Road, Lower Coombses.
- Culvert(s) and watercourse on Scrapton Lane.
- Drainage system in Chaffcombe.

The installation of a 'sleeping policeman' at Nimmer Mill by Highways should be expedited.

Changes in local planning policy should be considered. Currently the standard requirement for drainage in a housing development is to cope with a 1 in 5 year event for highways drains, and to cope with greenfield runoff rates for surface water drainage. Consideration should be given to adopting a higher standard, and/or specifying a policy of betterment.

There are areas on the Highways gully map that are sparsely populated. These areas should be surveyed, and the locations of any private drainage arrangements should be recorded for information purposes.

A full modelling study for the villages around Chard, similar to that being undertaken for Chard, should be considered.

There should be events and materials to educate riparian owners around Chard as to their rights and responsibilities.



<p>Planned Developments</p>	<p>The planned development at Blackdown heights has naturally raised concerns about the destination of surface water from this development. The full plan is available via South Somerset District Council’s Planning Portal. The natural flow path of water from this site is towards the east.</p> <p>Full planning permission has been granted and development has begun. The full details are available under planning permission number 19/00074/FUL, but moving from outline to full planning permission being granted was conditional on a number of things, including:</p> <ul style="list-style-type: none"> <li>• Surface water shall not discharge onto the highway.</li> <li>• Surface water details to serve the development shall be submitted and approved by the Local Planning Authority.</li> </ul> <p>The developers have proposed to meet these conditions by installing a surface water attenuation area (sustainable urban drainage basin) and ecological habitat enhancement at the east end of the site.</p> <p>According to the developers: “The Flood Risk Assessment and Drainage Strategy confirm that the site is not within an identified floodplain or an area at risk of flooding. Surface water will be controlled and managed to existing local watercourses and existing drains to the east and west. A sustainable urban drainage basin proposed at the east end of the site will accommodate runoff arising from the development during periods of extreme rainfall.</p> <p>The Environment Agency (and previously the Council's Engineer) have assessed the Flood Risk Assessment (FRA) and are satisfied that surface water can be satisfactorily controlled to ensure that the risk of flooding downstream of the site is not increased. Whilst the evidence received from residents clearly shows that the local area has and continues to suffer from flooding, the FRA has demonstrated, with the agreement of the Environment Agency, that this development can be adequately mitigated to ensure that there is no increase in terms of flood risk to adjacent and other sites.”</p> <p>There is a further development awaiting a decision which is Land East Of Mount Hindrance Farm, near Crimchard and Cuttifords Door. This is for 295 dwellings. Again, in order to have full planning permission granted, the developer will need</p>
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to submit and have approved a drainage strategy for the site which will make flooding in the area no worse.

The Holbear development on the south extent of Chard is also causing concern amongst local residents. Modelling has shown that the surface water draining from this development will drain into the watercourse that heads towards Forton. The following condition has been imposed on the planning permission:

‘No development shall be commenced until details of the surface water drainage scheme, based on sustainable drainage principles, ... have been submitted to and approved in writing by the Local Planning Authority. ... The drainage scheme shall ensure that surface water runoff post development is attenuated on site and discharged at a rate and volume no greater than greenfield runoff rates and volumes.’ So far, the developers have not proposed a suitable scheme to meet this condition.

Dialogue is ongoing between the Local Authority, Lead Local Flood Authority, the developers, and other stakeholders to ensure that whatever the developers propose will meet this criteria.

In both cases, proper implementation of the planning conditions should ensure that, at the very least, the developments will not worsen existing flooding.

<p>Ongoing Works</p>	<p>Work is currently ongoing through the LLFA to model surface water flow paths around Chard, with a view to identifying and prioritising potential flood mitigation solutions.</p> <p>Following this, the study on Chard will be expanded to other settlements in the area.</p> <p>A Chard resilience group has been set up, under the auspices of the Town Council. While the group was convened on the back of flooding incidents, their remit is to support with all adverse weather events.</p>
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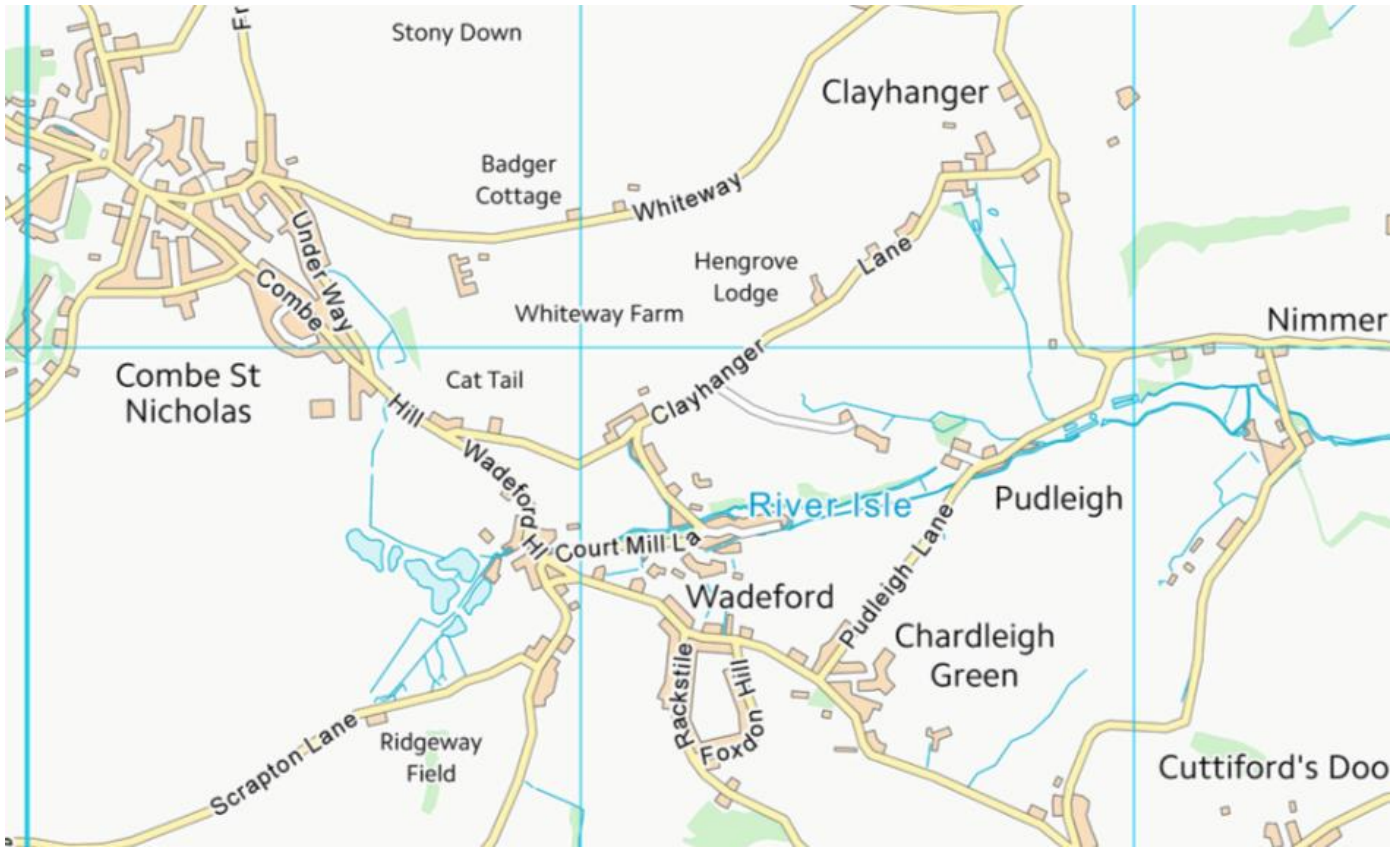
Planning Policy  
and Future  
Development

The pillar of planning policy on surface water is that developments must not increase flood risk elsewhere or cause risk to people and properties. As referred to in the Planned Development section above, incoming planning applications have conditions applied to them which ensure that runoff from the development is attenuated on site. No more surface runoff water should leave the site than did while it was an undeveloped, grassed field (the 'greenfield rate'). This should ensure that no development makes flooding in the area around it worse. This is in accordance with 'The National Planning Policy Framework Section 14; Meeting the challenge of climate change, flooding and coastal change', and also the Government standards for SUDS, published on the .gov.uk website. It is required that runoff must not increase due to the development, and all runoff should be first restricted to the greenfield 1 in 1-year runoff rate during all events up to and including the 1 in 100-year rainfall event, with 40% added for climate change on top of previous rainfall figures. If this cannot be met from infiltration and site design, long term storage of surface water needs to be added to allow water to be released gradually from site. There should also be a full maintenance and operational management schedule for the development confirming the body who will maintain the system for the lifetime of the development. We would expect to see full a full operational and maintenance schedule, confirmation and adoption arrangements before planning permission is fully granted.

In order for the Local Authority to require any stricter standards to be applied (such as accounting for events at greater than 1 in 100 years return period, or requiring runoff at less than greenfield rates), this needs to be stated in local planning policy.

It is recommended that further work be undertaken with a view to requiring stricter standards to be applied to surface water management by developers in affected areas in and around Chard.

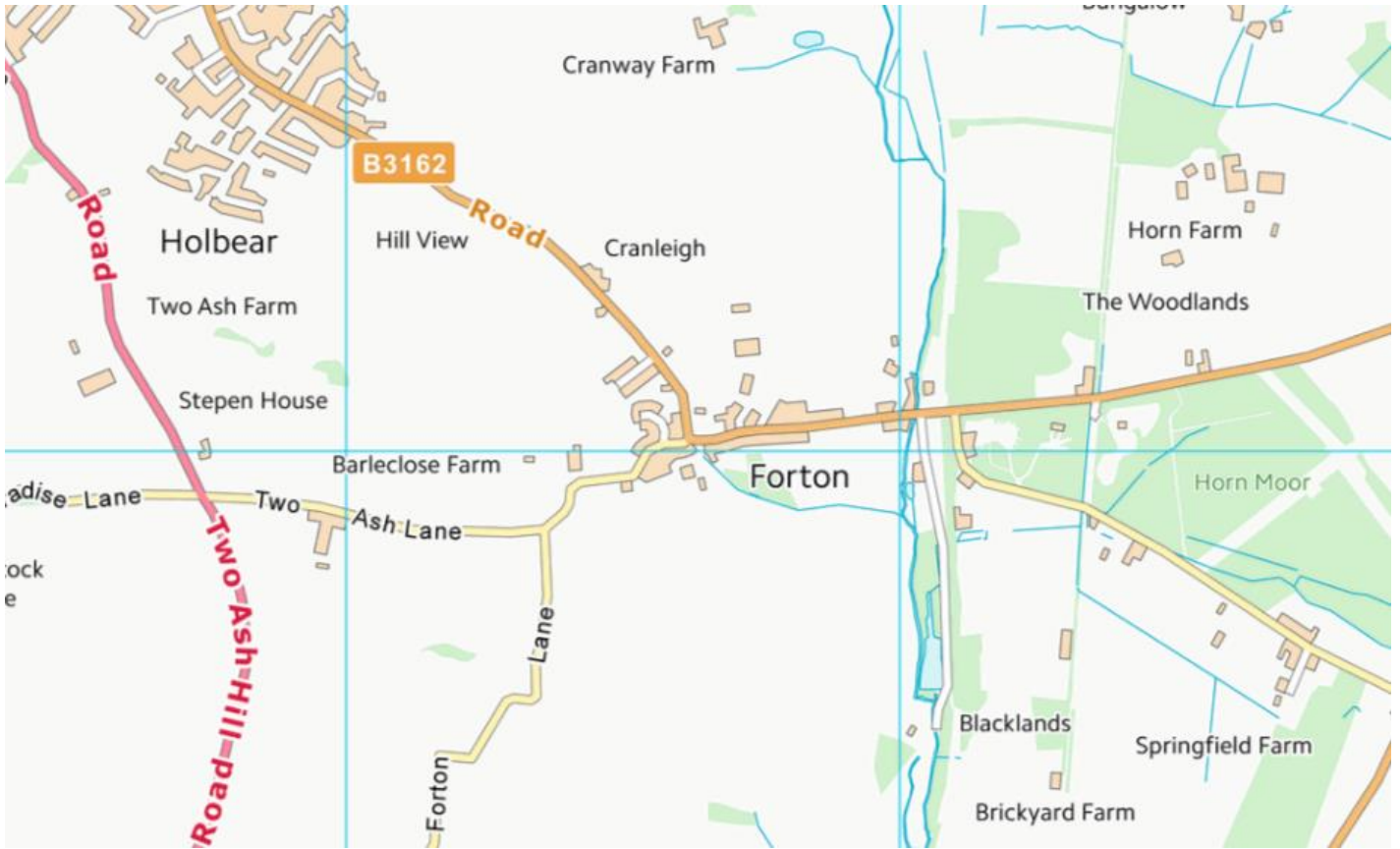
## Appendix 1: Figures



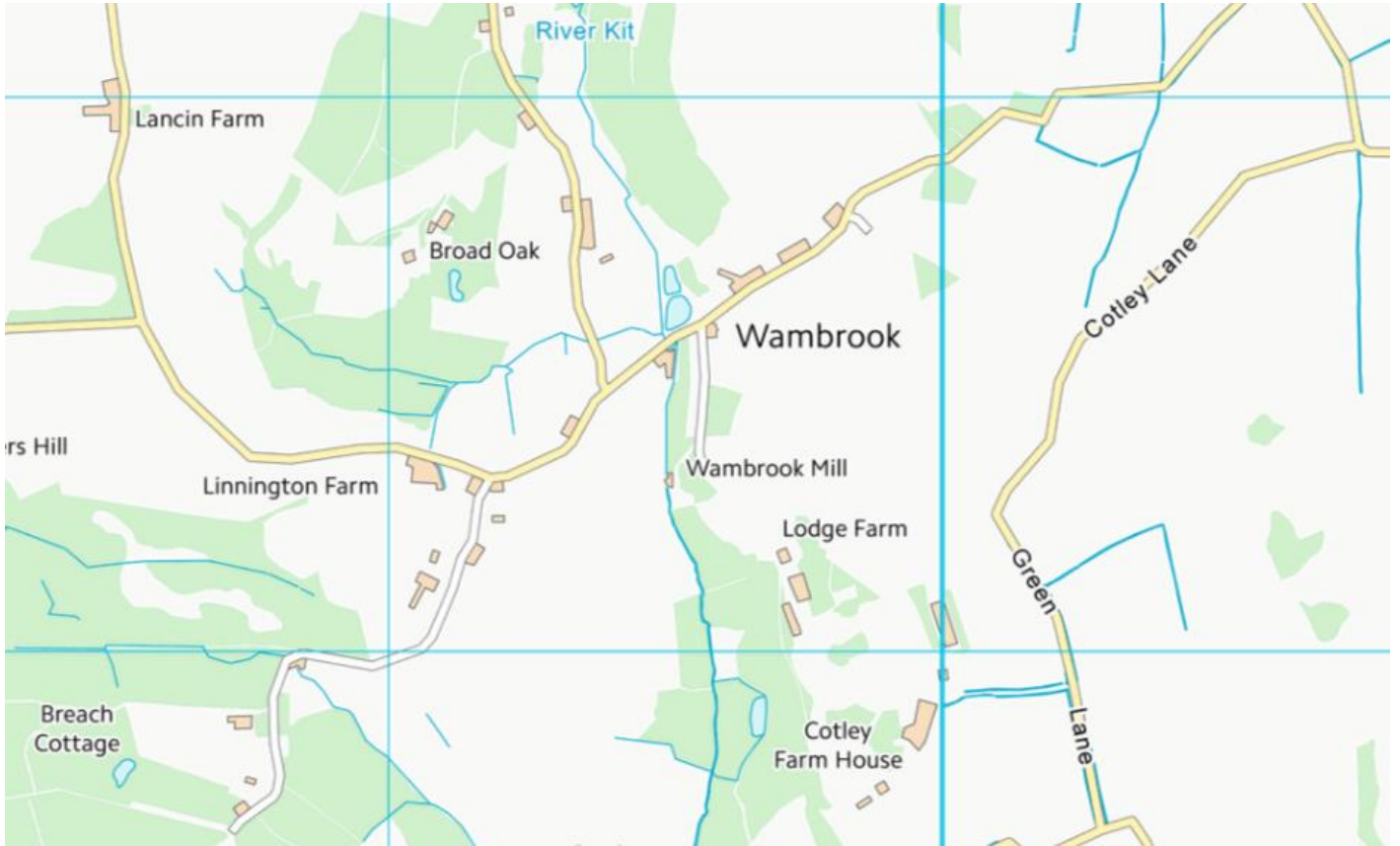
**Figure 10: Wadeford, Combe St Nicholas and Nimmer**



**Figure 11: Coombeses and Tatworth**



**Figure 12: Forton.**



**Figure 13: Wambrook**



*Photos from Chard:*



***Figure 14: East Street, Chard. Just off the High Street.***



***Figure 15: Crimchard Road, Chard.***



***Figure 16: High Street, Chard***



***Figure 17: Mitchell Gardens, Chard***



***Figure 18: Mitchell Gardens, Chard***



*Figure 19: Outside B&Q, Furnham Road, Chard.*



***Figure 20: Surface water entering Furnham Road Industrial Estate from Coker Way, a residential area to the south. Photo supplied by Turnweld Engineering.***



***Figure 21: Furnham Road Industrial estate. Picture from Chard and Ilminster News.  
[bit.ly/3Jaijxn](https://bit.ly/3Jaijxn)***

*Photos from Wadeford:*



***Figure 22: The front of a house on Court Mill Lane – note that the water is up over the window ledges. Photo supplied by Parish Clerk.***



***Figure 23: Main road around Goblin Hollow. Photo supplied by Parish Clerk.***



***Figure 24: Back Garden of a house at Chapel Triangle, Wadeford. Photo supplied by Parish Clerk.***

Flooding in Wadeford rose extremely high in places, and water ran down the sloping streets to the bottom of the village with considerable force and speed.

*Flooding in the villages:*





**Figure 25: Flooded properties in Wadeford.**



**Figure 26: Flooded properties in Nimmer.**

Again, here the main flooding mechanism, as reported by the Parish Council, was the overland flow of surface water from nearby fields to a topographical lowpoint. Residents near the river explicitly stated that they were flooded from overland flow, not from the river rising. Blocked drains and blocking of a culvert installed in 2009 were implicated as contributing to the problem.



**Figure 27: Flooded properties in Combe St Nicholas**

The main mechanism of flooding here, according to Parish Council reports, was surface water running downhill off of nearby fields, and down Wadeford Hill / Combe Hill. The village is at a topographical lowpoint. They also reported that the watercourse in the centre of the village rose in level, and that some properties were affected by both flooding mechanisms.

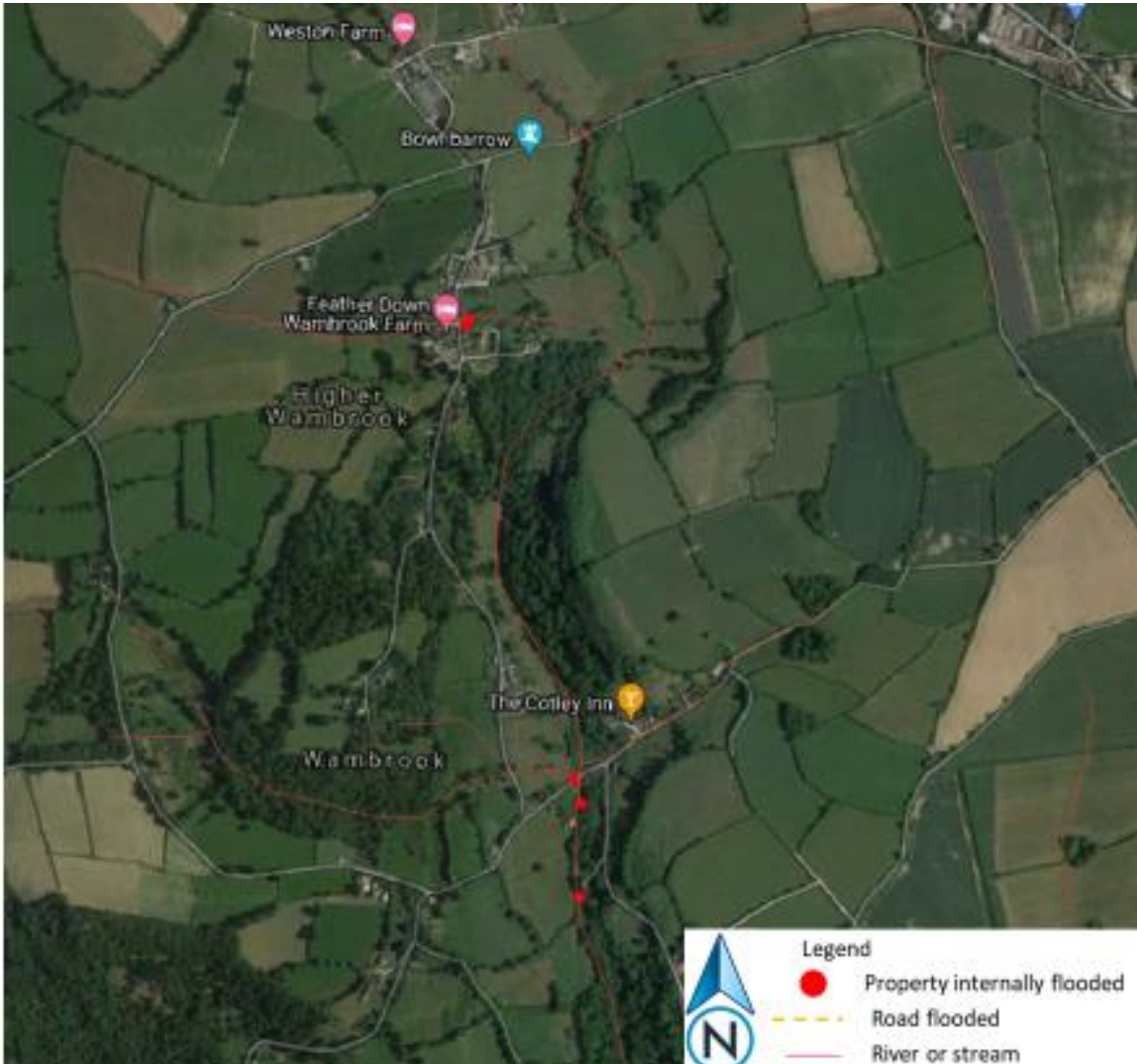
Extent of flooding in Forton:



**Figure 28: Flooded properties in Forton.**



**Figure 29: Flooded properties in Tatworth and Lower Coombses**



**Figure 30: Flooded properties in Wambrook.**

Outlying areas:



***Figure 32: Flooded properties and road damage in Scampton Lane***



***Figure 32: Flooded areas and damaged roads in Whitestaunton.***

Note that the report for flooding and damage outside the settlement only named 'White Ash Lane'. The area shown is the steepest section, and therefore thought most likely to have sustained damage



**Figure 33: Flooded properties in Chard**



***Figure 34: Damage to Scampton lane. From***  
[Chard flooding aftermath leaves roads completely destroyed - Somerset Live.](#)





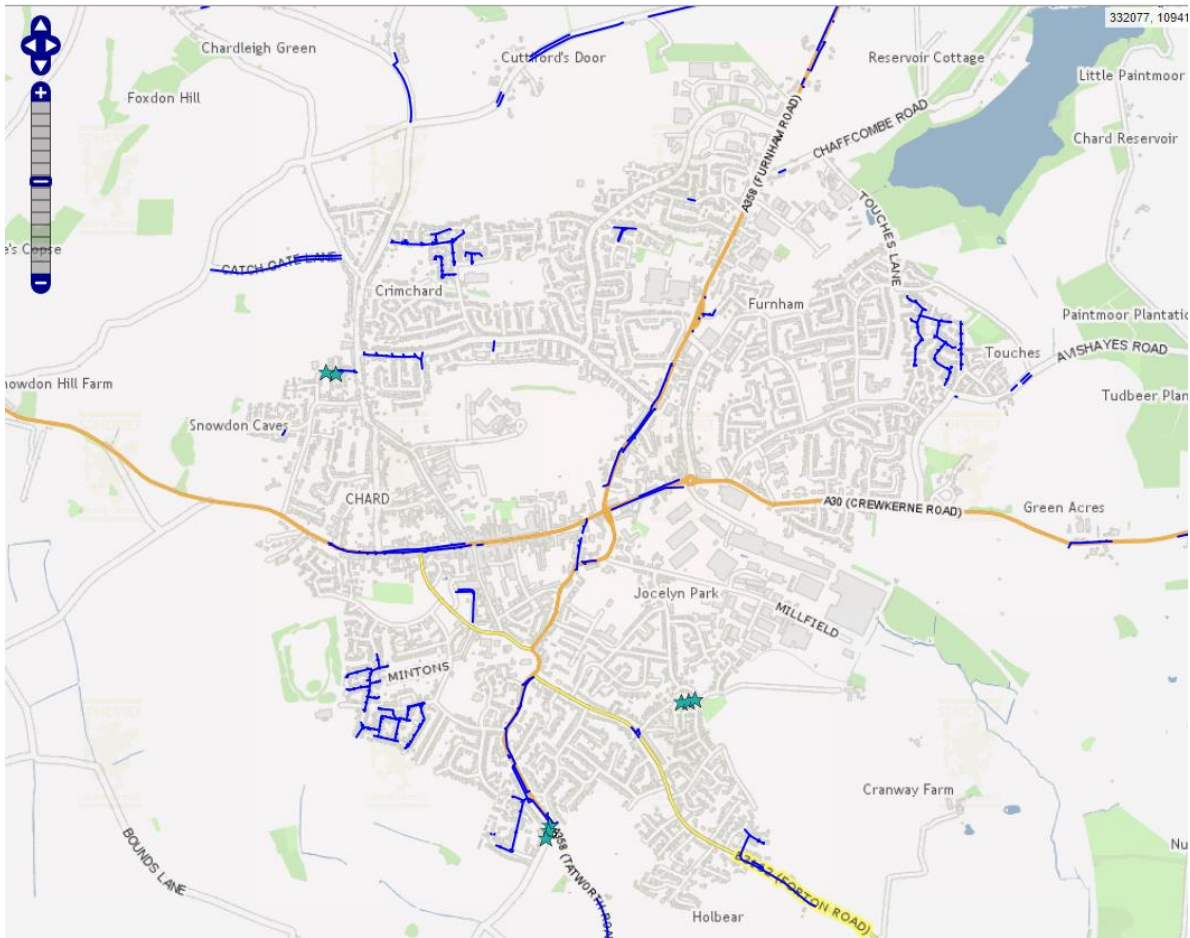
***Figure 35: Road damage in Whitestaunton. Photo from [Access restored as Highways teams respond to flash flooding damage](#) | Somerset County Council Newsroom ([somersetnewsroom.com](#)).***

**Appendix 2: Historical information.**

Date	Location	Receptor
July 1968	Wadeford	2 houses
October 1994	Nimmer	2 houses
January 1995	Wadeford	Road
	Knowle St Giles	Road
	Thorndon Park Drive, Chard	2 houses
May 2011	Whatley	Road
October 2011	Furnham Road, Chard	Road
November 2011	Combe St Nicholas	Road
May 2012	Winsham	Road
August 2012	Winsham	Road
September 2012	Knowle St Giles	Road
November 2012	Crimchard Road	Road
	Chard Junction	2 houses
October 2013	Combe St Nicholas	Road
	Wadeford	Road
December 2013	Bath Street, Chard	1 commercial property
January 2014	Crewkerne Road, Chard	Road in two places
	Dening Close, Chard	Road
	Combe Street, Chard	1 house
Records marked 'pre 2015'.	Victoria Avenue, Chard	Road
	Station Road Tatworth	1 house

	Court Mill Lane, Wadeford	4 houses
	Forton, Chard	2 houses, Road
	Whatley lane, Winsham	Road
	Whatley	Road
	Furnham Road, Chard	Road, twice
	Church Street, Winsham	Road, outbuilding
	Amerham Lane, Winsham	Road
	Davies Close, Winsham	Road
	Crimshard, Chard	Road
	Perry Street, Tatworth	1 house
	Wayside, Wadeford	Road
	Bath Street, Chard	1 commercial premises
	Dening Close, Chard	Road
	Crewkerne Road, Chard	Road
	Combe Street, Chard	1 house
	A30, Chard	Road
	Chaffcombe Lane, Chard	1 house, road

### Appendix 3: Drainage pipes in Chard



**Figure 36: Highways Surface water drainage pipes in Chard.**



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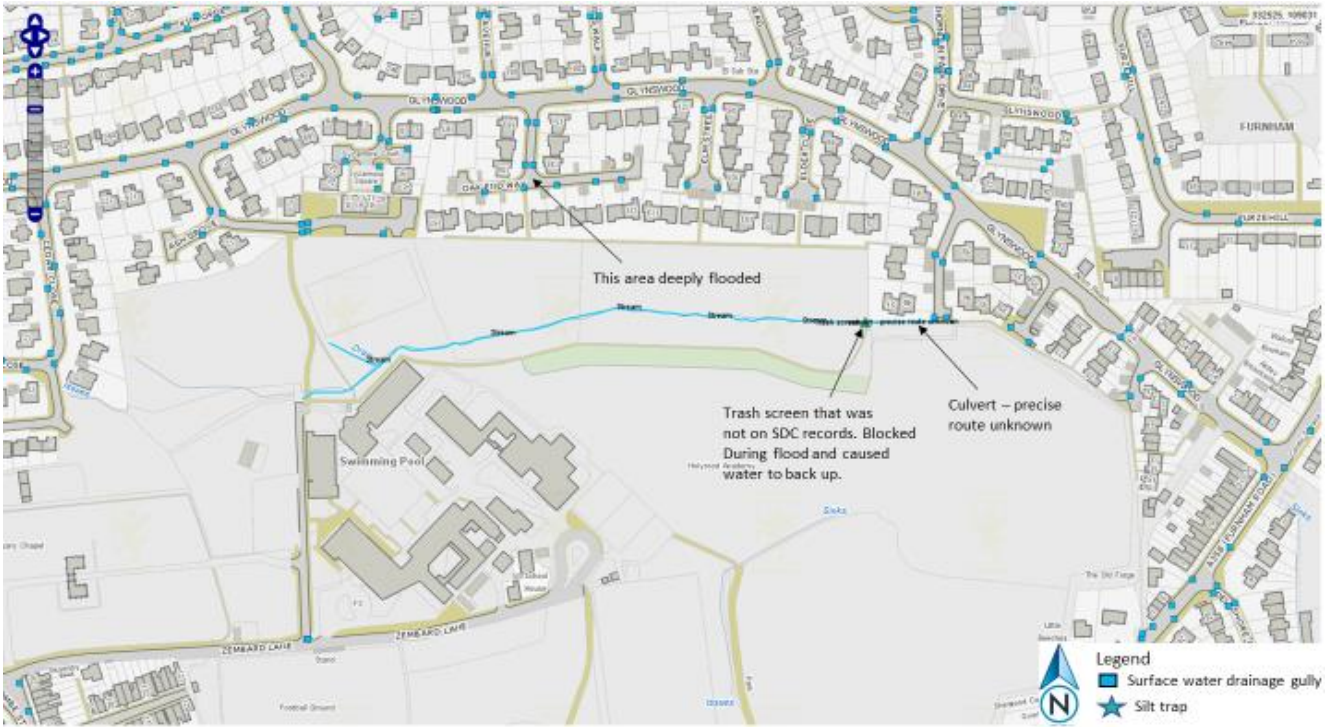


**Figure 37: Highways Gullies in Chard**



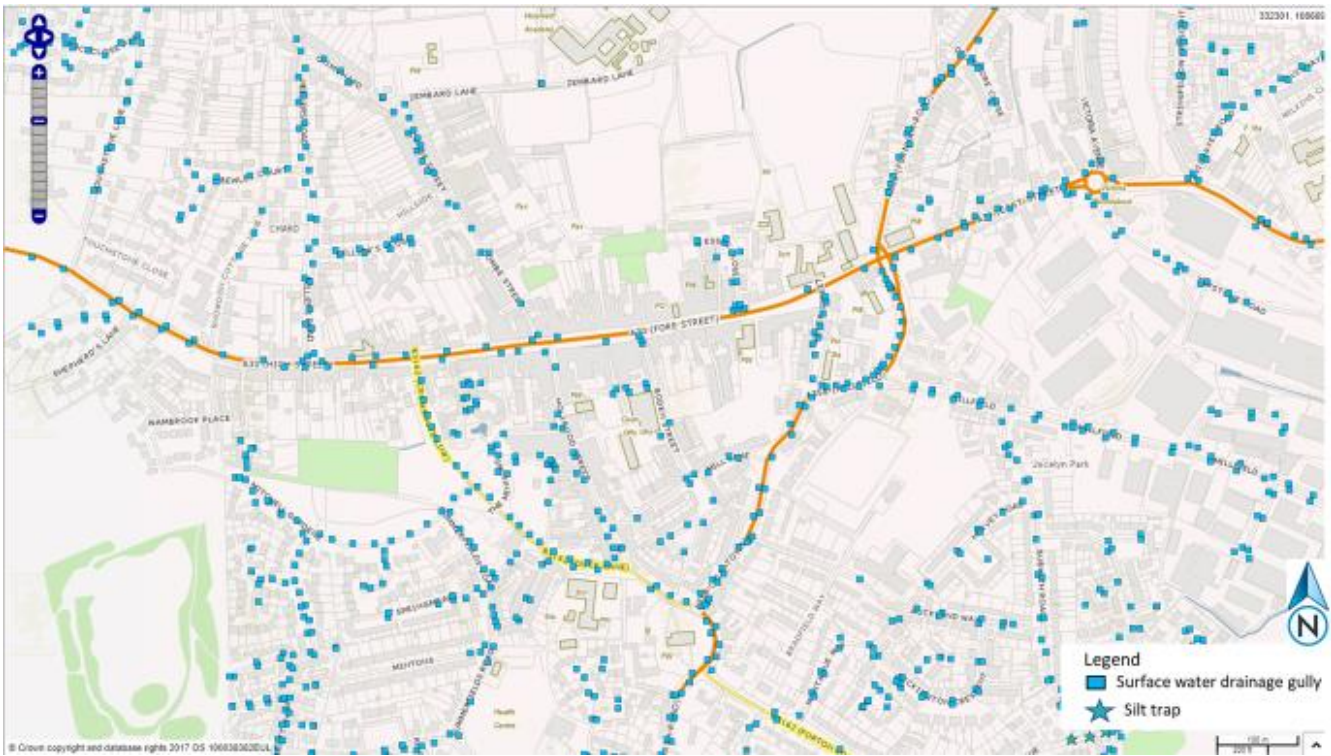
**Figure 38: Highways Surface water drains in Furnham Road Industrial Estate.**

The absence of any apparent gullies around the Furham Road industrial estate needs to be looked at and the location of private gullies recorded, along with their ownership.



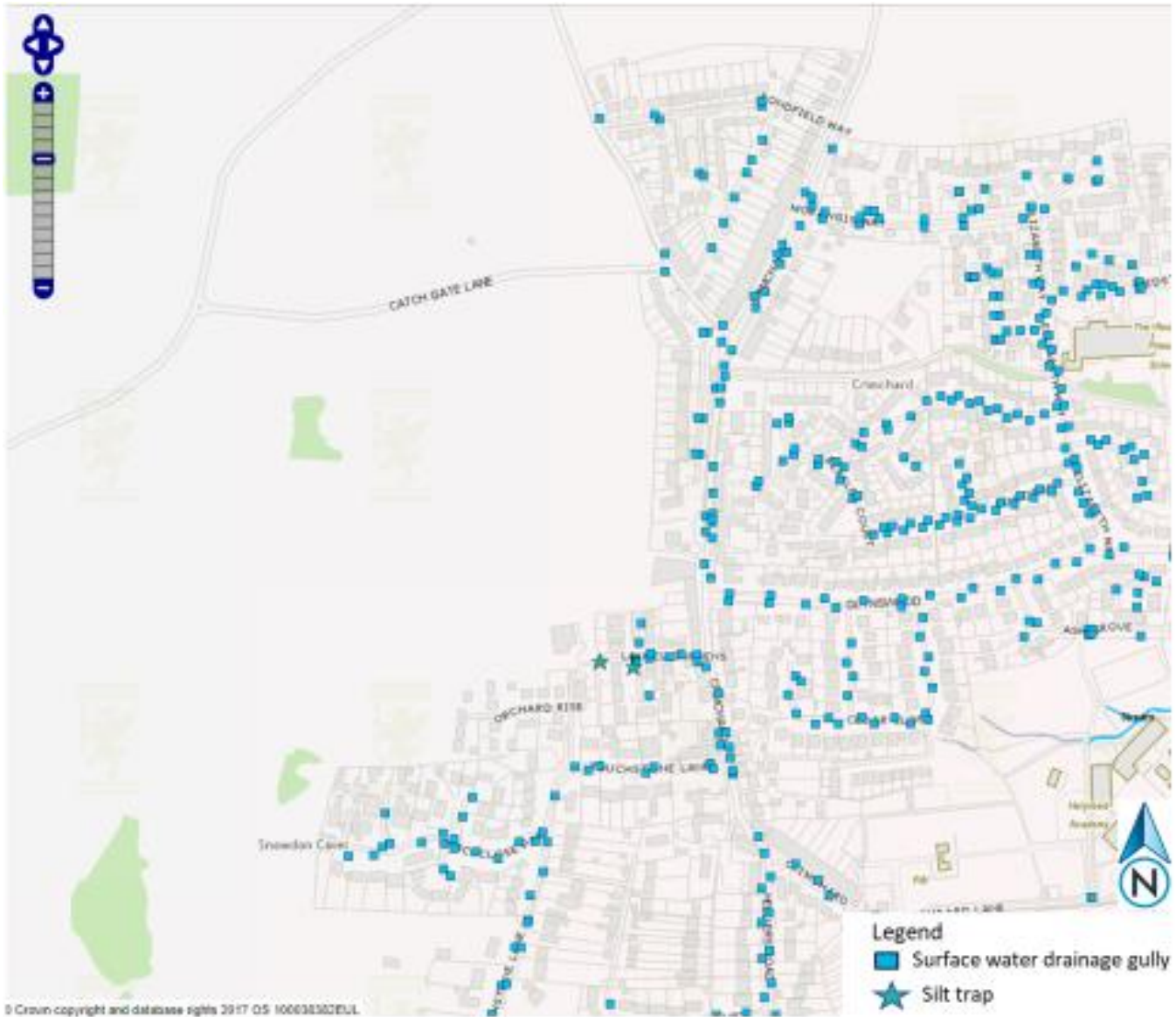
**Figure 39: Highways Surface water drains in Glynswood.**

The absence of gullies around the Academy and leisure centre needs to be looked at.



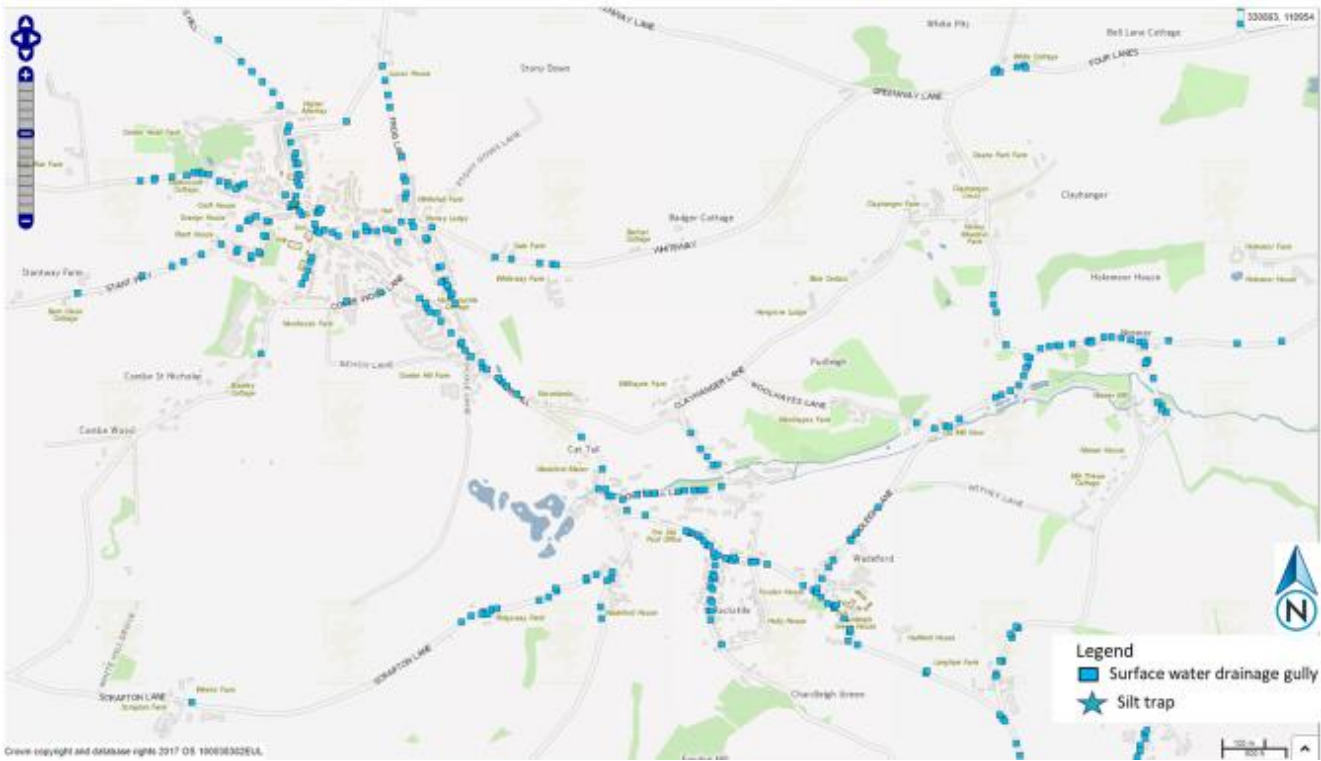
**Figure 40: Highways Surface water drainage around the High Street and East Street.**

There are large areas here with no apparent gullies. Again, this needs to be looked at and any gullies and their ownership recorded.

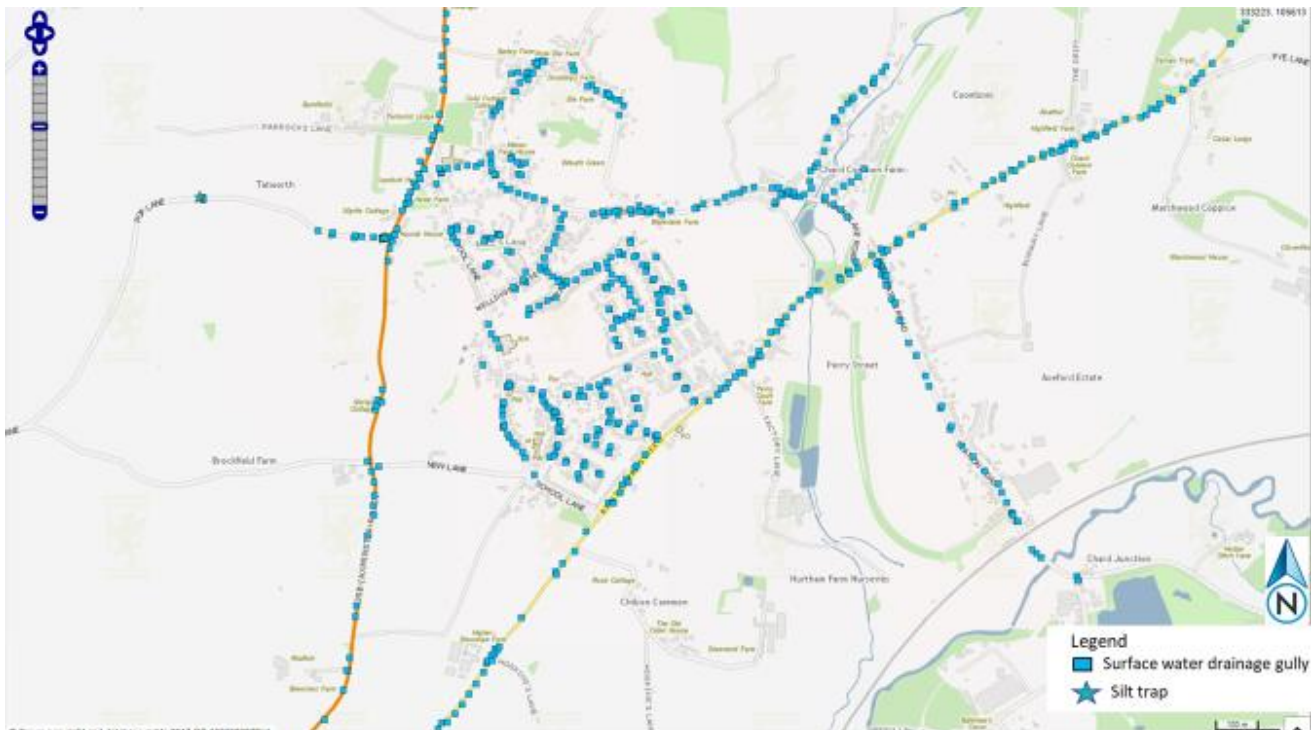


**Figure 41: Highways Surface water drainage around Crimchard and Touchstone Lane.**





**Figure 42: Highways Surface water drainage in Combe St Nicholas, Wadeford and Nimmer.**



**Figure 43: Highways Surface water drainage in Coombes and Tatworth.**



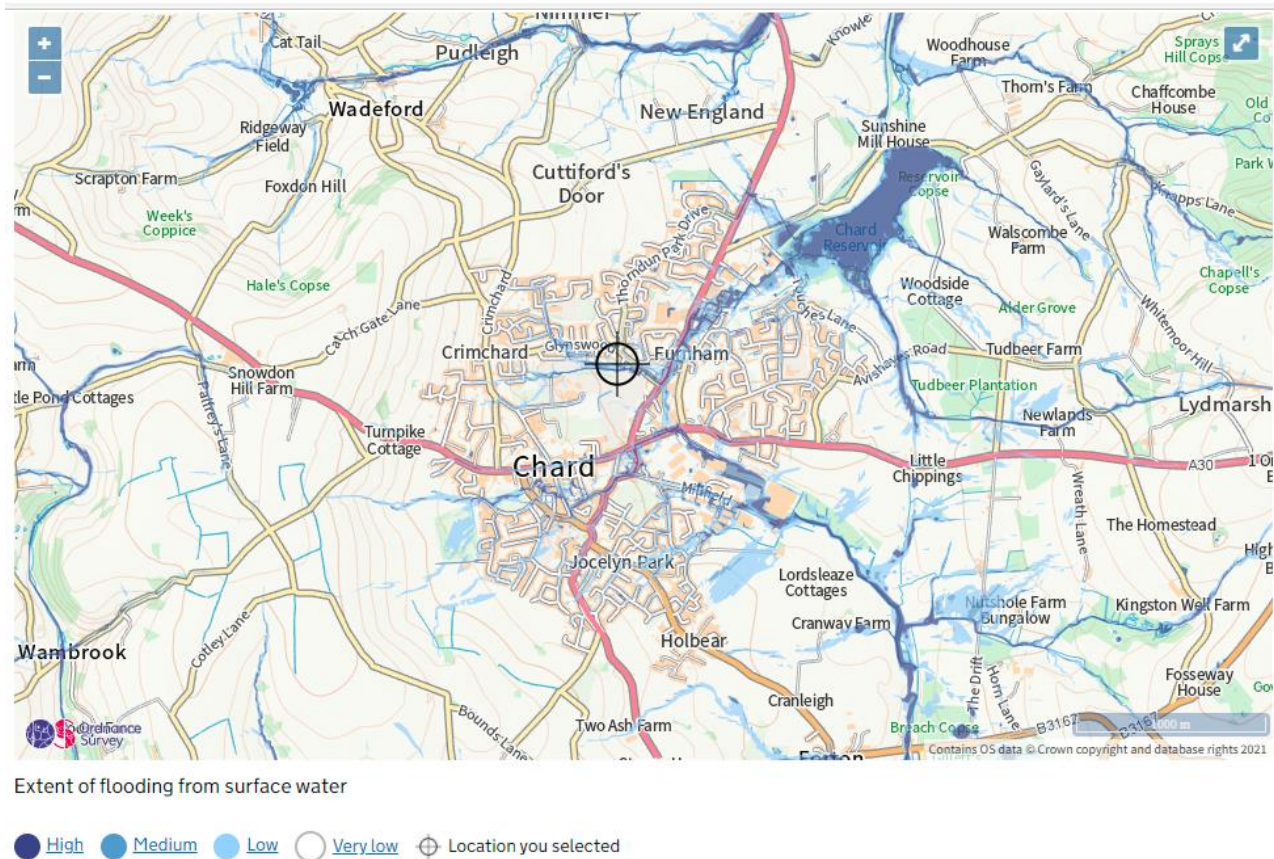
**Figure 44: Highways Surface water drainage in Forton.**

There are no gullies in the centre of the village. This needs to be looked at and confirmed.



**Figure 45: Highways Surface water drainage in Wambrook.**

#### Appendix 4: EA Surface water flood mapping.



**Figure 46: Surface water flood risk map for the whole of Chard**

Surface water flood risk maps show the risk of flooding from pluvial sources – from rainfall accumulating and forming an overland flow. It considers the drainage systems in the area. It does not show predicted fluvial flooding – that is, flooding resulting from rising levels in rivers and streams. However, the two effects often occur together, as both pluvial flow and rivers and streams will naturally locate in the lowest topographical points.

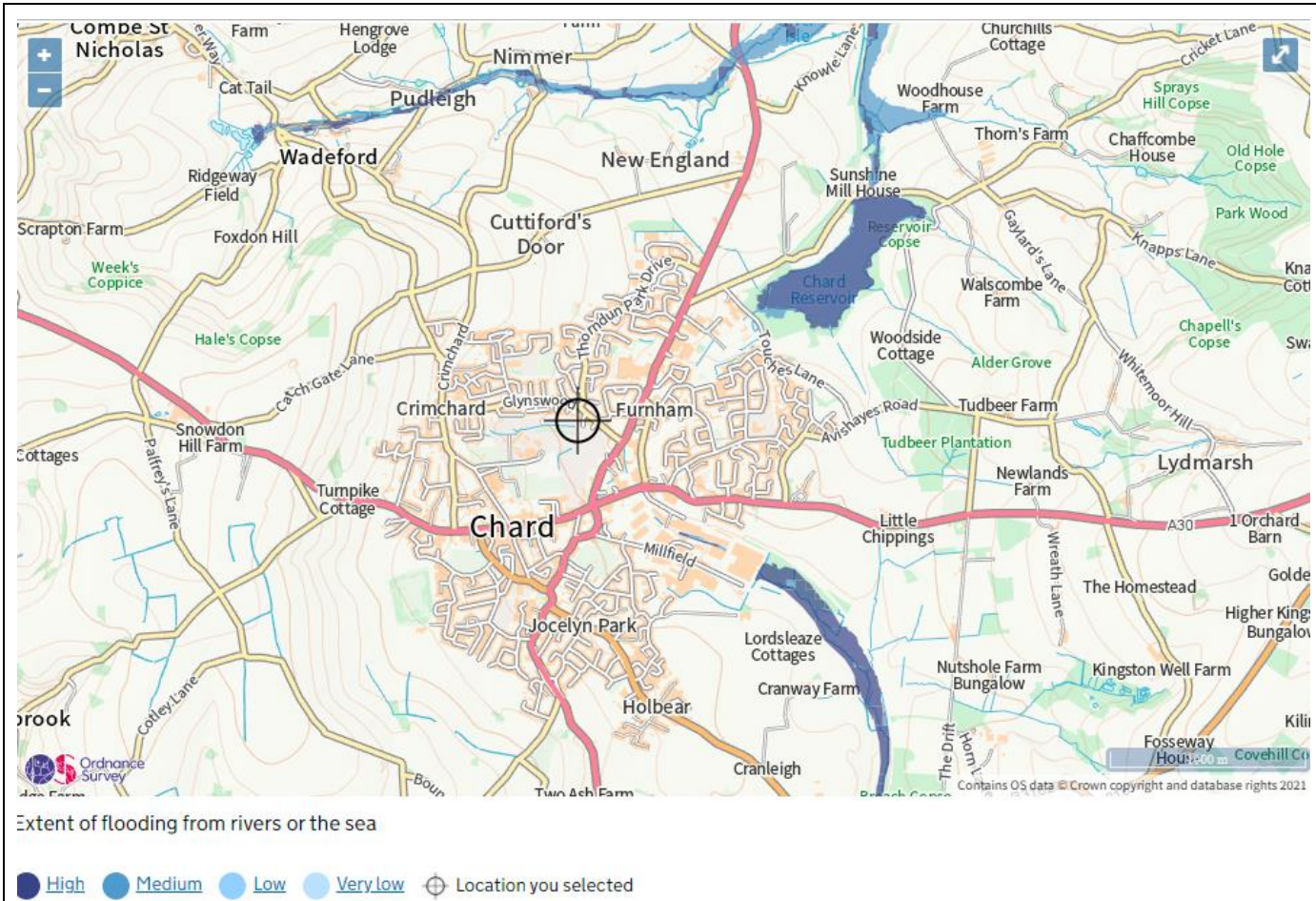
The maps show four different grades or frequencies of flooding – dark blue areas (high risk) will flood most frequently, with an average 3.3% chance of flooding in each year.

Mid blue areas (medium risk) will flood only after heavier rainfall – in these areas there is an average chance of flooding between 1% and 3.3% each year.

Light blue areas (low risk) only flood after very heavy rain – here there is an average chance of flooding of between 0.1% and 1% per year.

Areas with no colouration have an average chance of flooding each year of less than 1%.

To put this in context, the rainfall event that fell on Chard in June 2021 has a 3% chance of occurring every year. That is extremely heavy rainfall, and is too heavy to be covered by this map. If the map was reworked to cover a 3% annual chance of flooding, the blue coloured area would be larger than it is now, and new areas would appear. As such, not every area which flooded during the June event will be shown on this map.



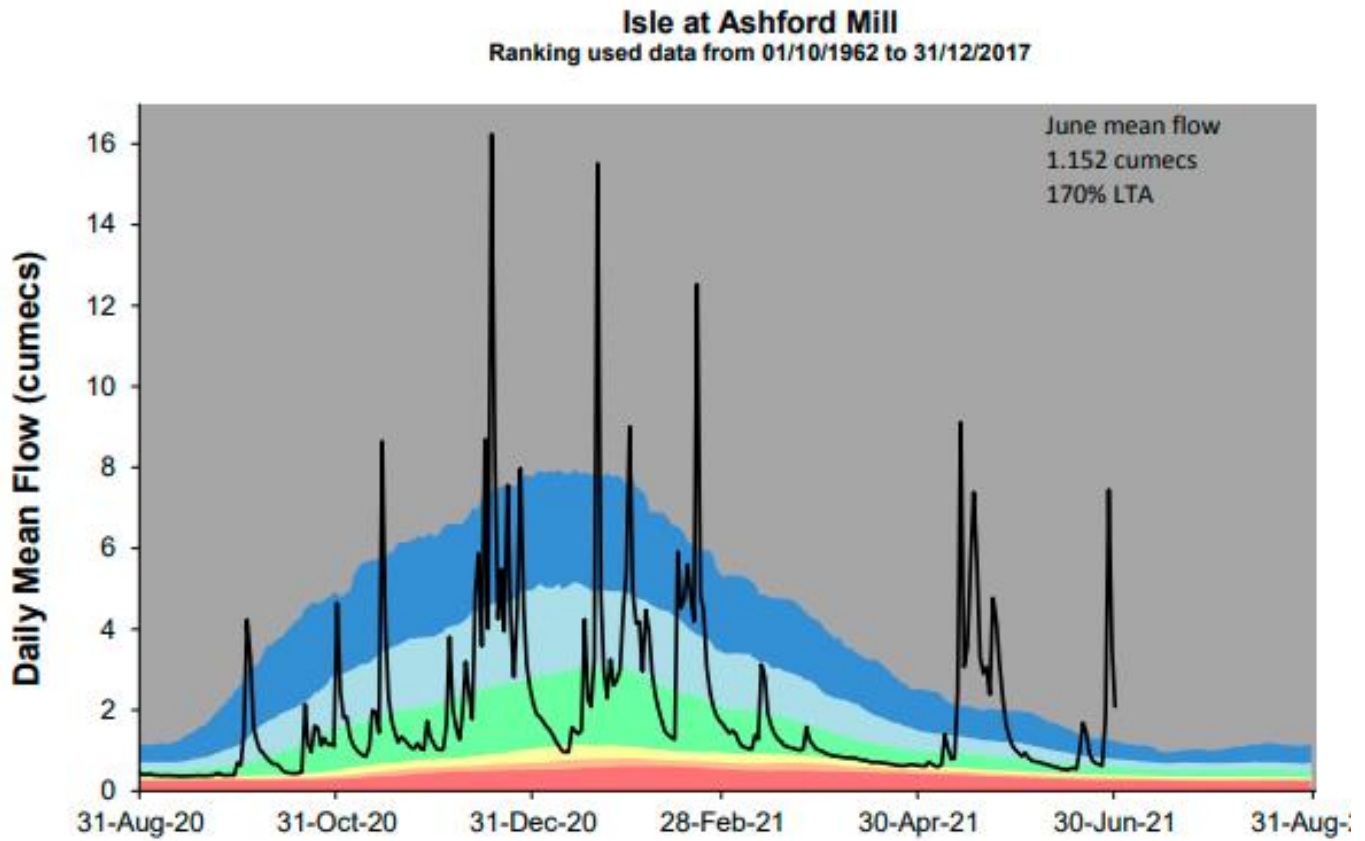
**Figure 47: Fluvial flood risk map, whole of Chard**

The nearest main river is approximately 1km from the fringes of Chard, in a north easterly direction. These are not implicated in the flooding event of the 28<sup>th</sup>. All waterbodies within Chard that may have been involved in the flood event are ordinary watercourses.

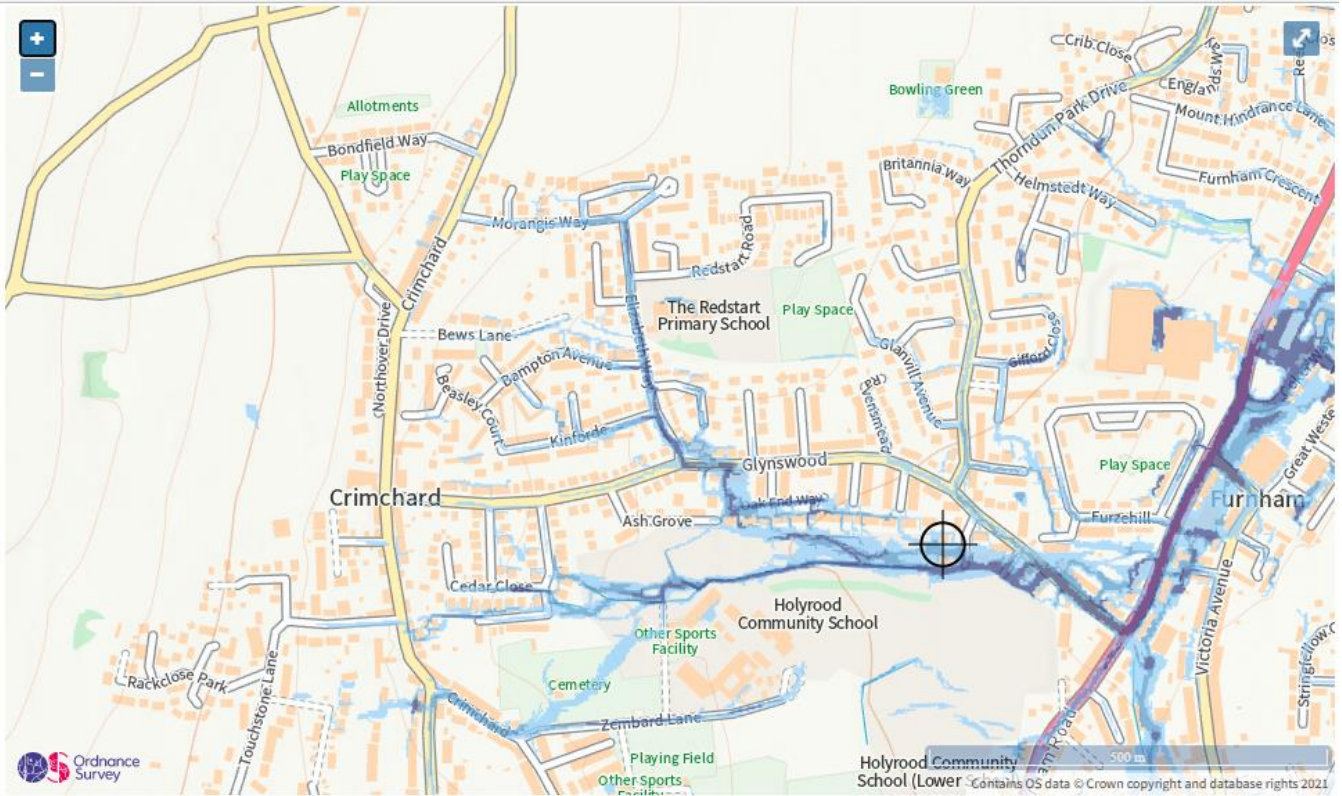
Although not implicated in the June flooding event, the fact that the River Isle at Ashford Mill was at 170% of long term average levels during June, gives some idea of the amount of water that was around in the catchment.

Very little fluvial flooding is predicted for within Chard itself, indicating that the flooding that occurred in June is likely mainly pluvial. Fluvial flooding is predicted for the centre of the villages of Wadeford and Nimmer. Some properties in Wadeford were described by the Parish Council as being affected by both pluvial and fluvial flooding. In Nimmer, properties on the main river Isle reported a blocked culvert being an issue – suggesting that rivers levels were rising and causing concern, if not actual

flooding, however residents on side stream reported that their flooding came entirely from overland flow.



**Figure 48: Daily Mean flow on the River Isle.**

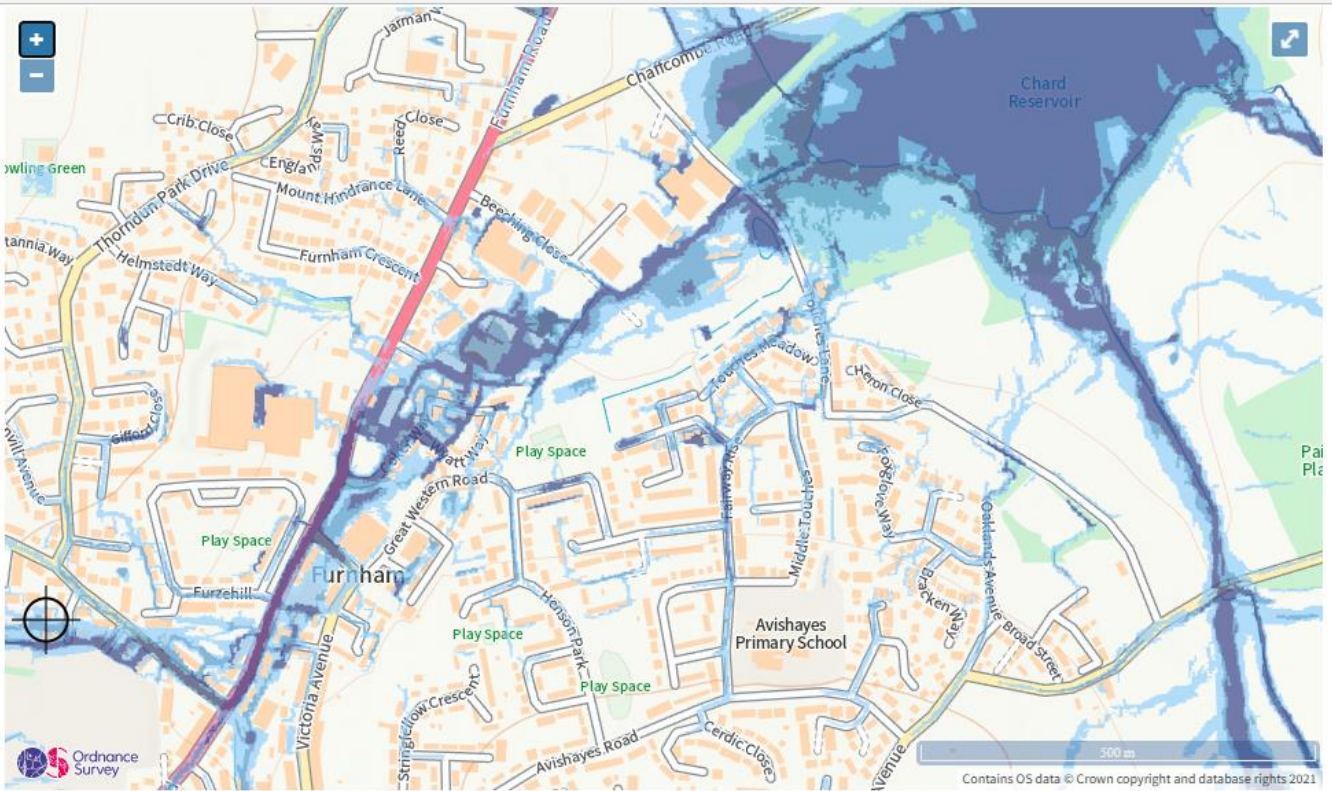


Extent of flooding from surface water

- High
- Medium
- Low
- Very low
- ⊕ Location you selected

**Figure 49: Surface water flood risk map for Glynswood**

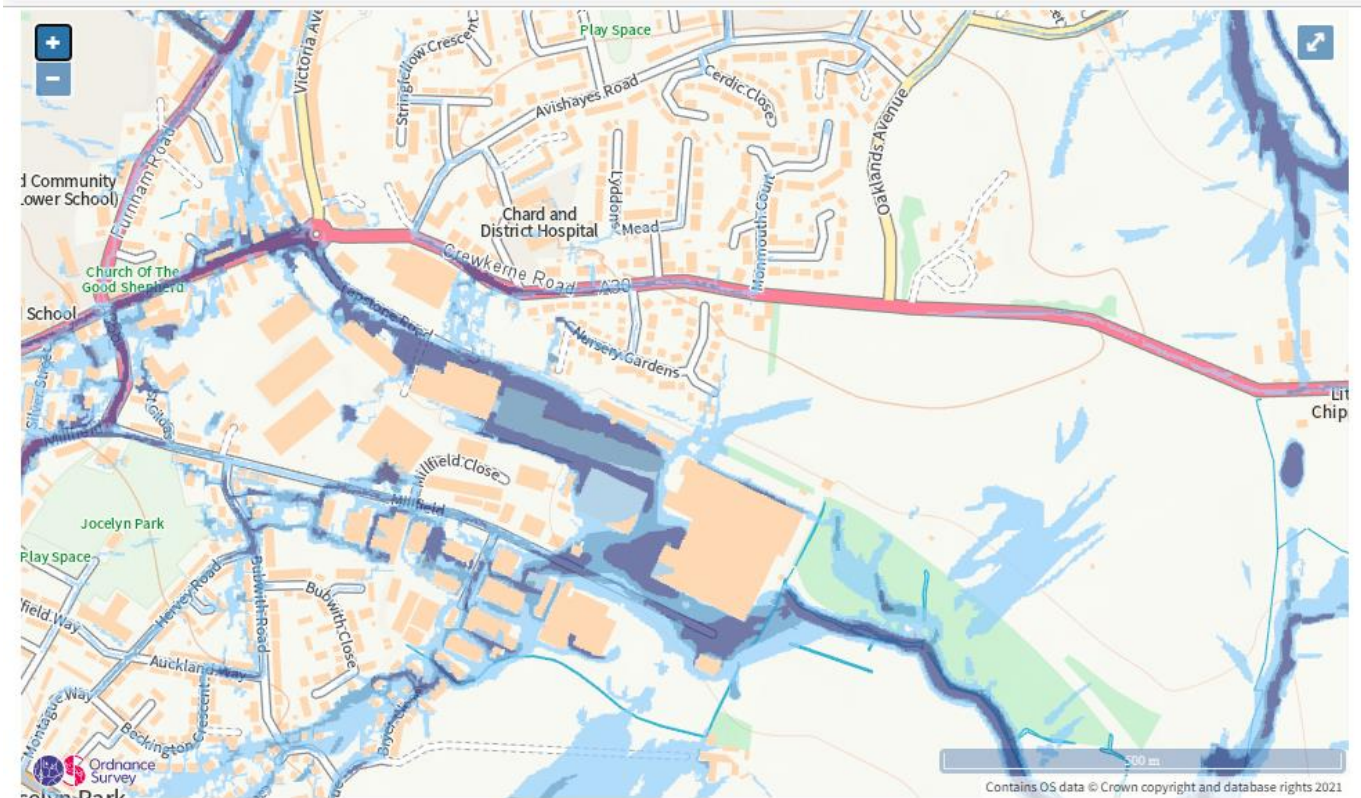




Extent of flooding from surface water

- High
- Medium
- Low
- Very Low
- ⊕ Location you selected

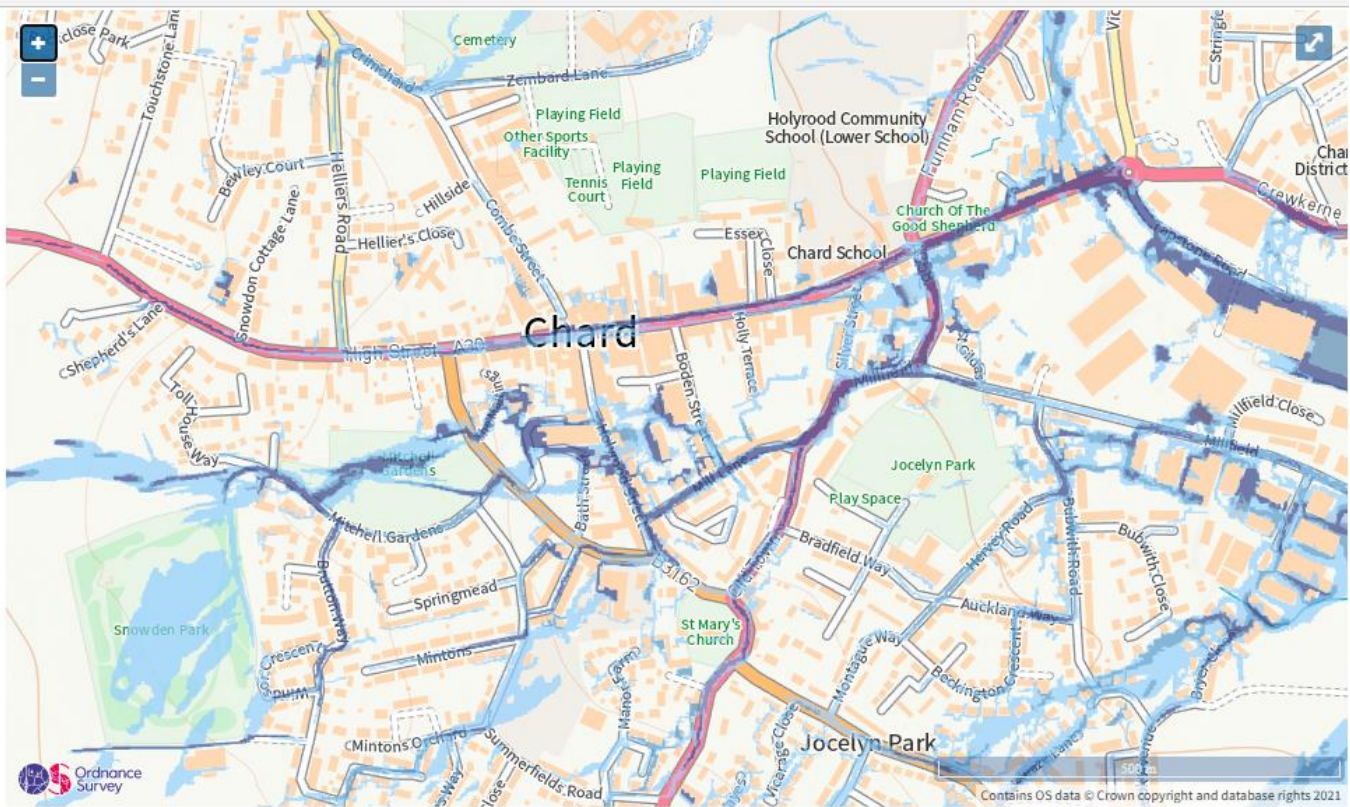
**Figure 50: Surface water flood risk map for Furnham**



Extent of flooding from surface water

- High
- Medium
- Low
- Very low
- Location you selected

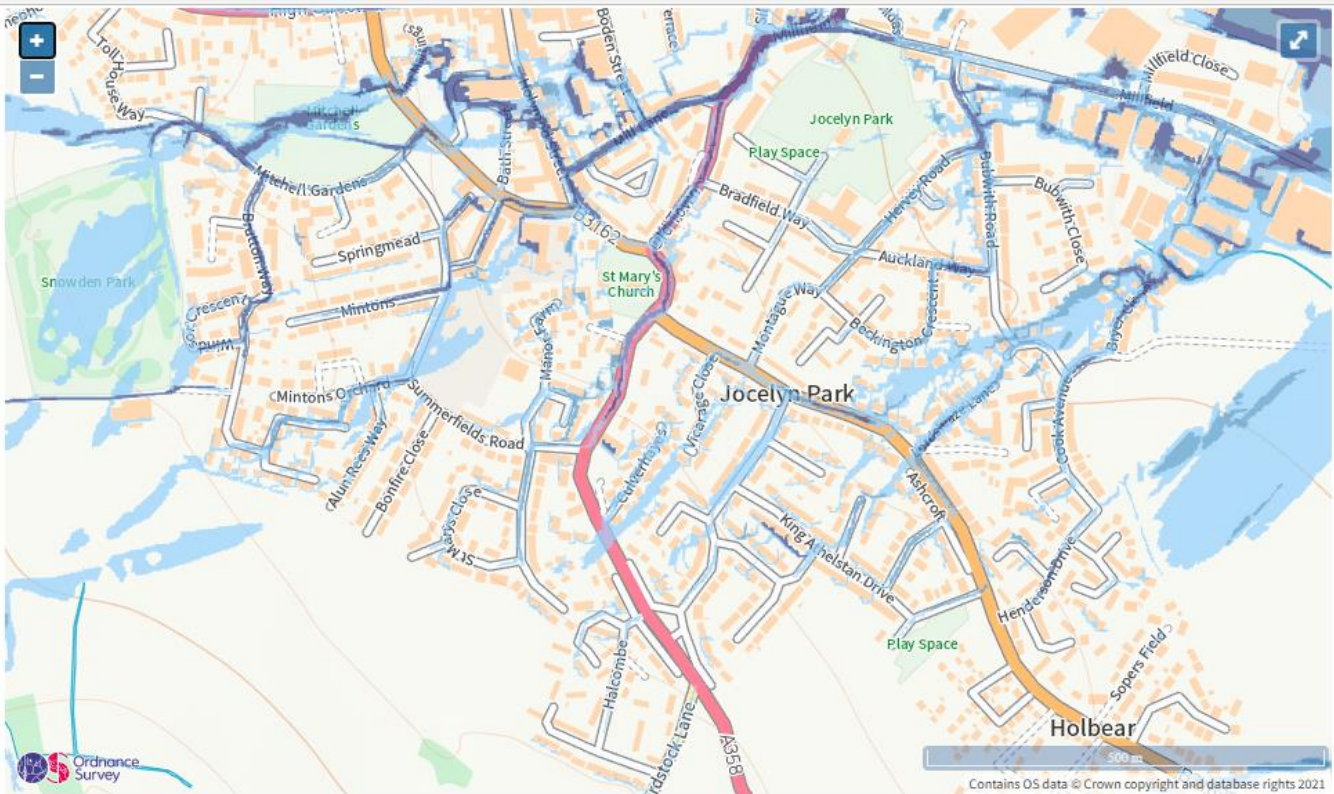
**Figure 51: Surface water flood risk map for Crewkerne Road**



Extent of flooding from surface water

● High ● Medium ● Low ○ Very low ⊕ Location you selected

**Figure 52: Surface water flood risk map for High Street**

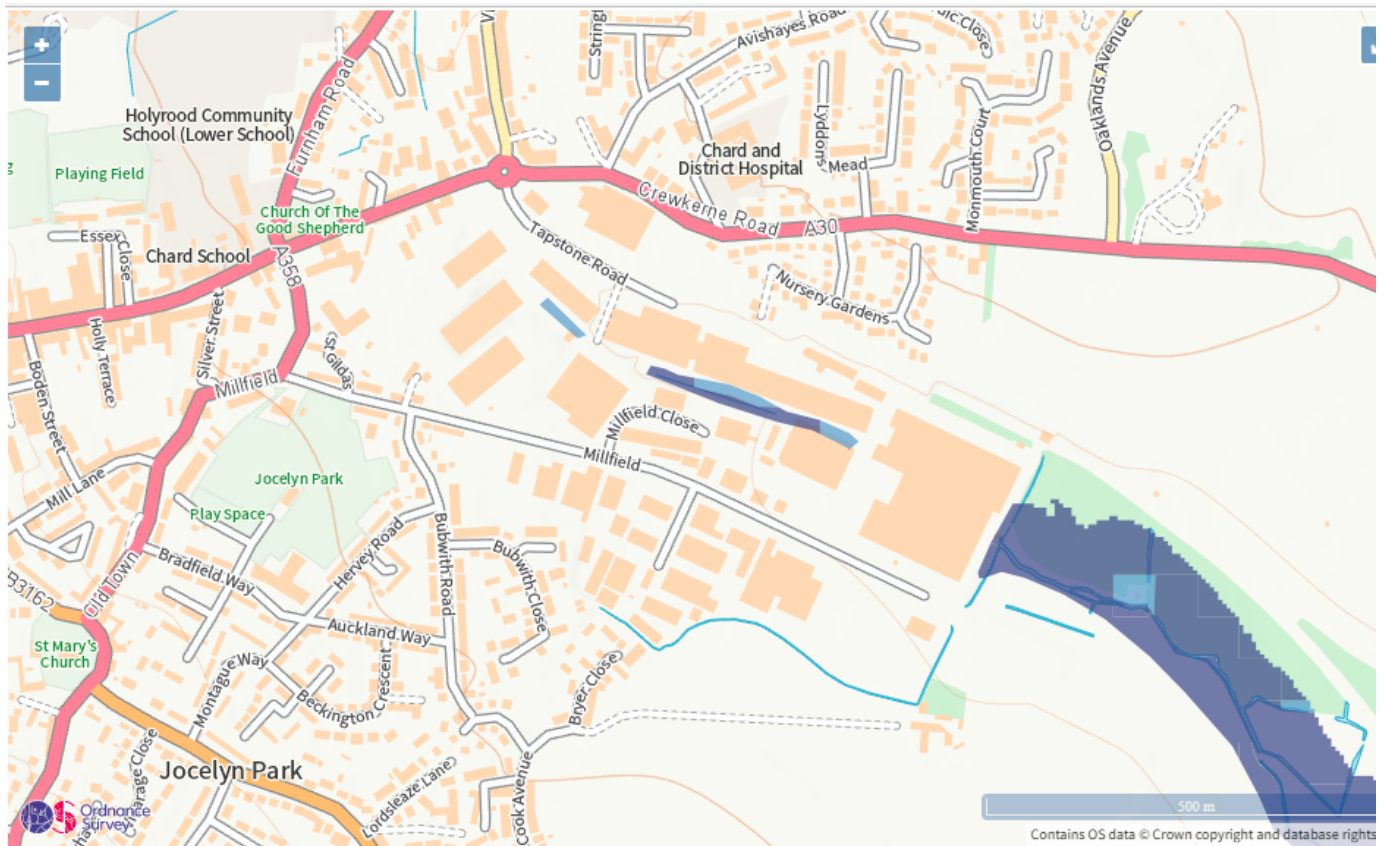


Extent of flooding from surface water

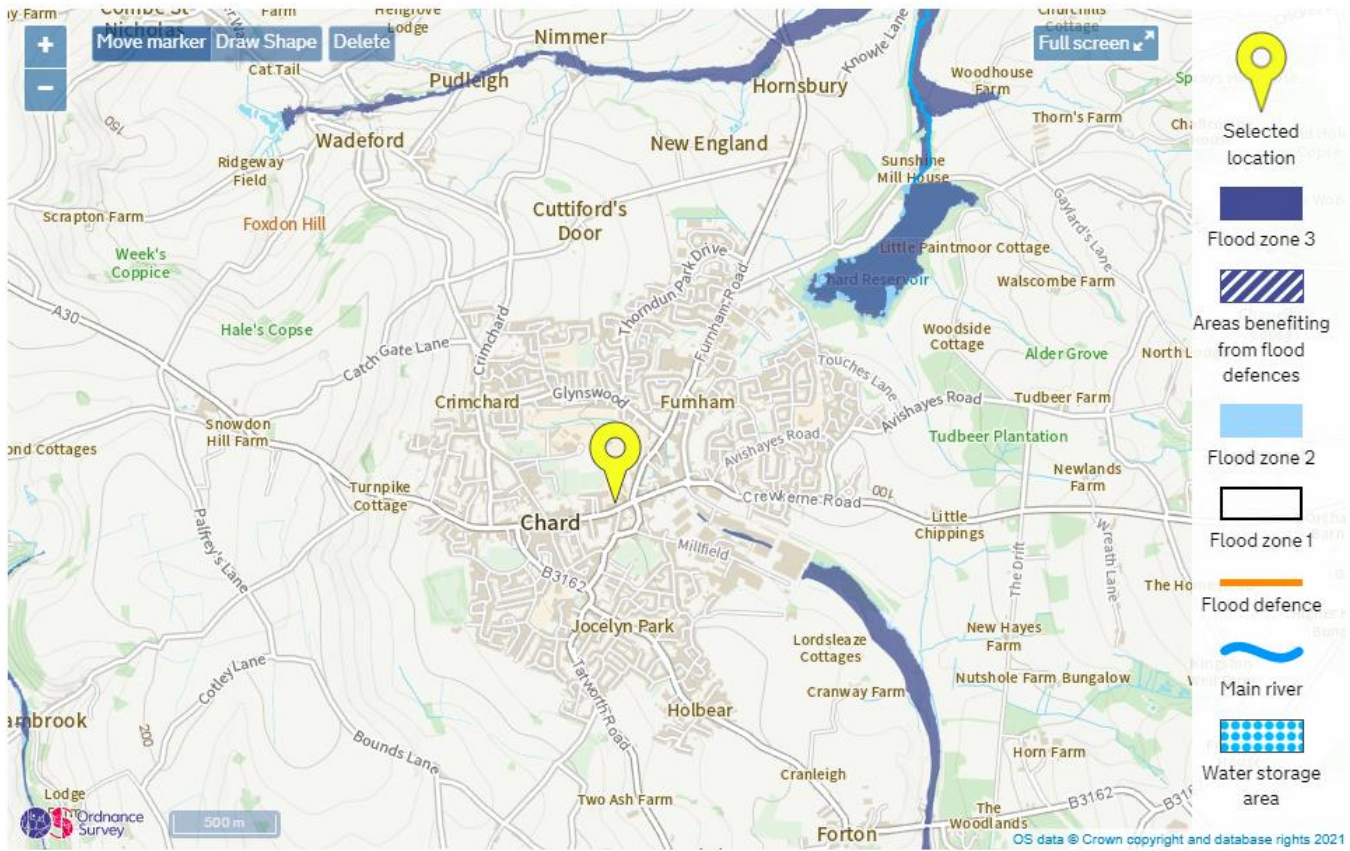
- High
- Medium
- Low
- Very low
- ⊕ Location you selected

**Figure 53: Surface water flood risk map for Jocelyn Park**

**Detailed fluvial flood risk maps:**



**Figure 54: Fluvial flood risk map, Millfield**



**Figure 55: EA Flood Map for Planning. Note that this only shows flood risk from fluvial sources.**

**Table 5: Stakeholder Roles and Responsibilities.**

<p>Somerset County Council (in their roles as LLFA and Highways Authority)</p>	<p>Risk Management Authority.</p> <p>As the LLFA they are required to develop a strategy to tackle local flood risks, involving flooding from surface water, 'ordinary watercourses', for example ditches, dykes, and streams, groundwater, canals, lakes and small reservoirs.</p> <p>Along with all LLFAs, they are required to:</p> <ul style="list-style-type: none"> <li>• investigate all significant flooding incidents;</li> <li>• maintain a register of flood defence assets;</li> <li>• act as a statutory consultee in the planning process on surface water for major developments; and</li> <li>• build partnerships and ensure effective working between authorities that have control over flood risk.</li> </ul> <p>They also have to undertake specific tasks associated with the Flood Risk Regulations, and this includes completing a Preliminary Flood Risk Assessment and identifying flood risk areas.</p> <p>As the highways authority they have the lead responsibility for providing and managing highway drainage and roadside ditches under the Highways Act 1980. The owners of land adjoining a highway also have a common-law duty to maintain ditches to prevent them causing a nuisance to road users.</p>
<p>Environment Agency</p>	<p>Risk Management Authority.</p> <p>The Environment Agency has a strategic overview of all sources of flooding and coastal erosion (as defined in the Flood and Water Management Act 2010). It is also responsible for coastal erosion risk management activities, regulating reservoir safety, and working in partnership with the Met Office to provide flood forecasts and warnings.</p> <p>The study area runs across one of their internal borders. Chard, Combe St Nicholas, Wadeford, Nimmer, and points north of the southern edge of Chard are handled by the Wessex office. South of this, including Tatworth and Forton, are handled by the Devon office.</p>
<p>Wessex Water</p>	<p>Risk Management Authority.</p> <p>They manage the risk of flooding to water supply and sewerage facilities and flood risks from the failure of their infrastructure. Their southernmost border is tight around the south side of Chard, so they are responsible for water and sewage in Chard itself, and</p>

	the northern settlements such as Wadeford, Combe St Nicholas, and Nimmer.
Somerset Rivers Authority (SRA)	Stakeholder Somerset Rivers Authority's main aim is to give Somerset greater flood protection and resilience. Somerset Rivers Authority focuses heavily on providing additional maintenance and improvements to rivers and their catchments, roads prone to flooding, and structures such as culverts and drains.
Devon and Somerset Fire and Rescue Service	Incident Response Lead. The Fire Brigade is typically the lead responder for a flooding incident. The Fire Brigade role includes saving life and carrying out rescue of casualties or persons stranded by flooding, including by boat. They may pump out floodwater.
Avon and Somerset Police	Incident Response. The police co-ordinate the emergency services during a major flood and help with evacuation of people from their homes where necessary. They also close roads and take other actions to ensure public safety.
South Somerset District Council	Risk Management Authority. They are key partners in planning local flood risk management. They can carry out flood risk management works on minor watercourses (outside of IDB areas).
South West Water	Risk Management Authority. They manage the risk of flooding to water supply and sewerage facilities and flood risks from the failure of their infrastructure. Their northernmost border is tight to the south side of Chard, so they are responsible for water and sewage in Tatworth and Forton.
Riparian Owners	Stakeholders Responsible for the maintenance of watercourses running through or bordering their land.



<p>Parish and Town Councils</p>	<p>Stakeholders.  Do not have statutory duties, but are often the people 'on the ground' helping local residents to safety, and to access property level emergency flood protection and information.</p>
<p>All bodies are required to work in partnership to support the local flood risk strategy, to ensure flood management activities are well co-ordinated, and work in partnership to reduce the severity and impact of flooding.</p>	