Flood Investigation Report

West End, Long Whatton – 14th November 2019

Final Report

September 2020

To discuss this report, please contact Flood Risk Management by email flooding@leics.gov.uk or by phone 01163 050 001

Contents

EXECUTIVE SUMMARY

On 14th November 2019 at least one residential property suffered internal flooding at West End, Long Whatton; the local highway network (West End and Sherwood Court) was also impacted.

The flooding was the result of an intense rainfall event which fell upon an already saturated catchment following a prolonged period of wet weather. The impermeable nature of the ground, the rapid inundation of the local drainage network and restrictions within the local drainage network contributed towards a situation that led to water internally entering at least one residential property.

It has been deemed necessary to carry out a formal flood investigation into the flooding which occurred at West End on 14th November 2019, as the incident has met locally agreed set criteria under Section 19 of the Flood and Water Management Act (FWMA, 2010).

This Flood Investigation Report has been produced by the Council fulfilling duties as stipulated in the FWMA.

1. PURPOSE OF THIS REPORT

1.1. SECTION 19 INVESTIGATIONS – DUTY TO INVESTIGATE

Under Section 19 of the Flood Water Management Act (FWMA, 2010), the Council has duties to fulfil as a result of certain flooding events. The FWMA states that:

(1) On becoming aware of a flood in its area, a LLFA must, to the extent that it considers it necessary or appropriate, investigate:

a. *which RMAs have relevant flood risk management functions, and*

b. *whether each of those RMAs has exercised, or is proposing to exercise, those functions in response to a flood event.*

(2) Where an authority carries out an investigation under section 1 (above) it must:

- *publish the results of its investigation, and*
- *notify any relevant RMAs."*

This report has been produced by the Council fulfilling this duty.

1.2. LEICESTERSHIRE COUNTY COUNCIL'S LOCALLY AGREED CRITERIA FOR FORMAL FLOOD INVESTIGATIONS

Leicestershire County Council from herein referred to as *"the Council",* identified local thresholds for formally investigating flood incidents across Leicestershire within the Local Flood Risk Management Strategy (published in August 2015). This policy advises when a formal flood investigation should be undertaken, including where one or more of the following occurs as a result of a flooding incident:

- Loss of life or serious injury
- Critical infrastructure flooded or nearly flooded from unknown or multiple sources
- Internal property flooding from unknown or multiple sources

In the following circumstances, discretion may be used to investigate a flooding incident where:

- A number of properties have been flooded or nearly flooded
- Other infrastructure flooded
- Repeated instances of flooding have occurred
- Investigation requested

- Risk to health (foul water)
- Environmental or ecologically important habitat has been affected
- The depth/area/velocity of flooding is a cause for concern.

1.3. FLOOD INVESTIGATION CRITERIA

A formal investigation into the flood incident at West End on 14th November 2019 was undertaken as the event triggered at least one of the locally agreed flooding characteristics or discretionary items as indicated below:

Mandatory Investigation	
Loss of life or serious injury	☐
Critical infrastructure flooded or nearly flooded from unknown or multiple sources	☐
Internal property flooding from unknown or multiple sources	☑
Discretionary Investigation	
A number of properties have been flooded or nearly flooded	☐
Other infrastructure flooded	☑
Repeated instances	☑
Investigation requested	☐
Risk to health (foul water)	☑
Environmental or ecologically important site affected	☐
Depth/area/velocity of flooding a cause for concern	☑

1.4. RISK MANAGEMENT AUTHORITIES (RMAS)

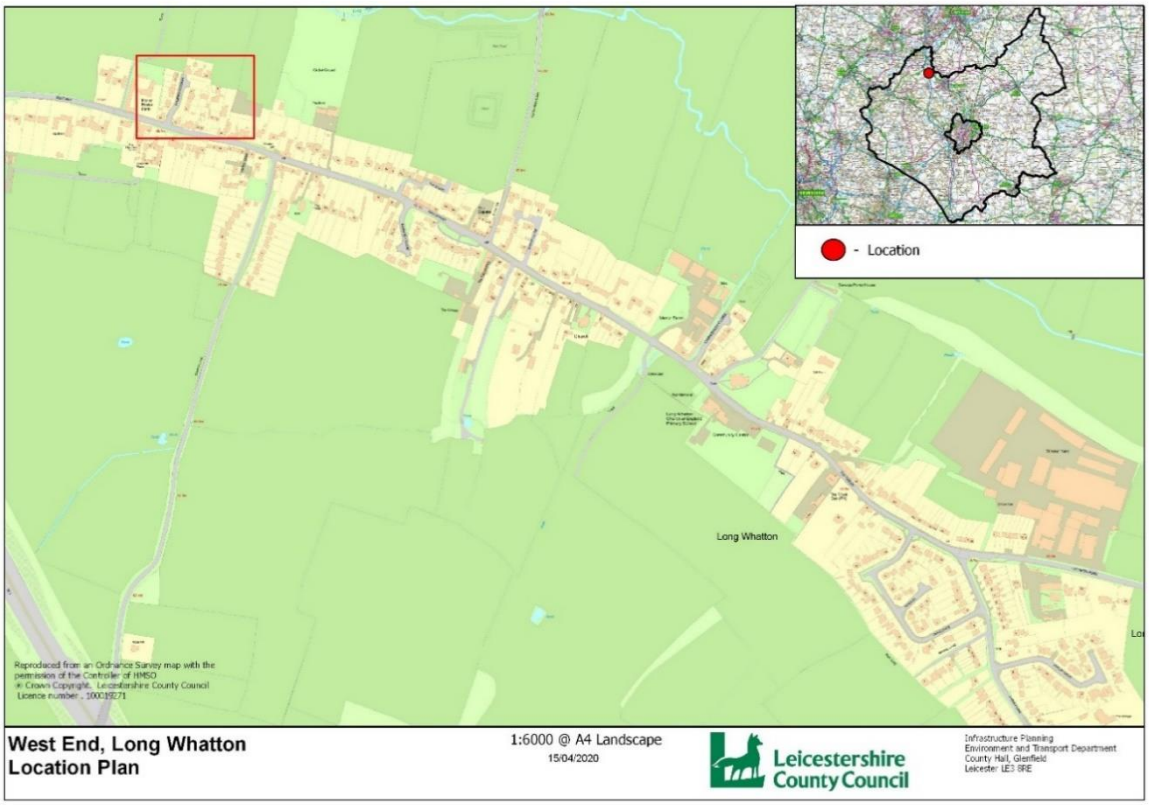
The following risk management authorities were identified as relevant to the flooding at West End:

- The Council – Lead Local Flood Authority
- The Council – Local Highway Authority
- North West Leicestershire District Council
- Severn Trent Water Ltd (STW)

2. BACKGROUND

2.1. LOCATION

Long Whatton is a village and parish located within North West Leicestershire District Council, approximately 27 km north-west of Leicester and approximately 18 km North East of Ashby-de-la-Zouch. Figure 1 shows the location of Long Whatton within



Leicestershire and highlights the area of the village affected by the flood event.

Figure 1: Location Plan

2.2. LOCAL DRAINAGE SYSTEM

Ordinary watercourses

There are believed to be two land drains running from No.16 & 20 West End and under land to the rear of these properties on which stands Sherwood Court (Figure 2).

- 'Land drain A' – located to originate from a highway chamber at top of the shared driveway of No.16/20 and runs down the driveway before diverting under No.20. This drain is severed in the land of No.10 Sherwood Court. The route of this land drain is not logged on any mapping or identified on any historical maps.

- ‘Land drain B’ - located between No.16/20 – believed to originate through front garden of No.16 and is currently severed in land of No. 12 Sherwood Court. The route of this drain is also not logged on any mapping or identified on any historical maps.

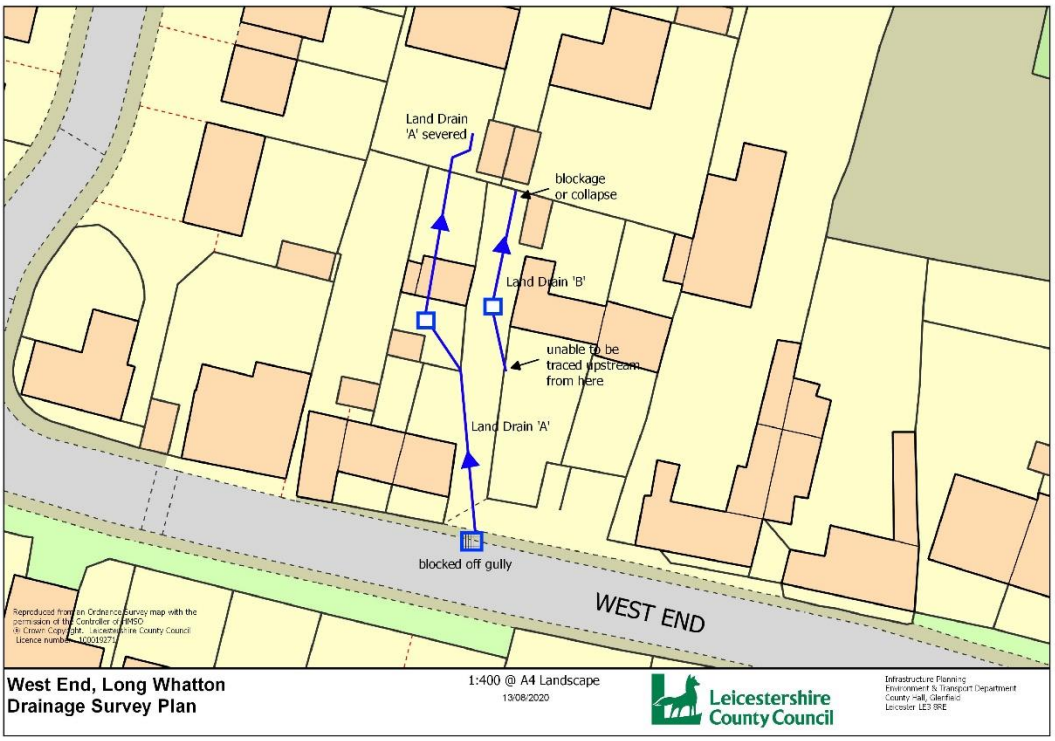


Figure 2: Location of land drains

Long Whatton Brook is the most significant watercourse in the vicinity of West End (Watercourse 1, as illustrated on Figure 3) and flows from the north-west to south-east to the north of the village. Long Whatton Brook is owned and maintained by multiple landowners.

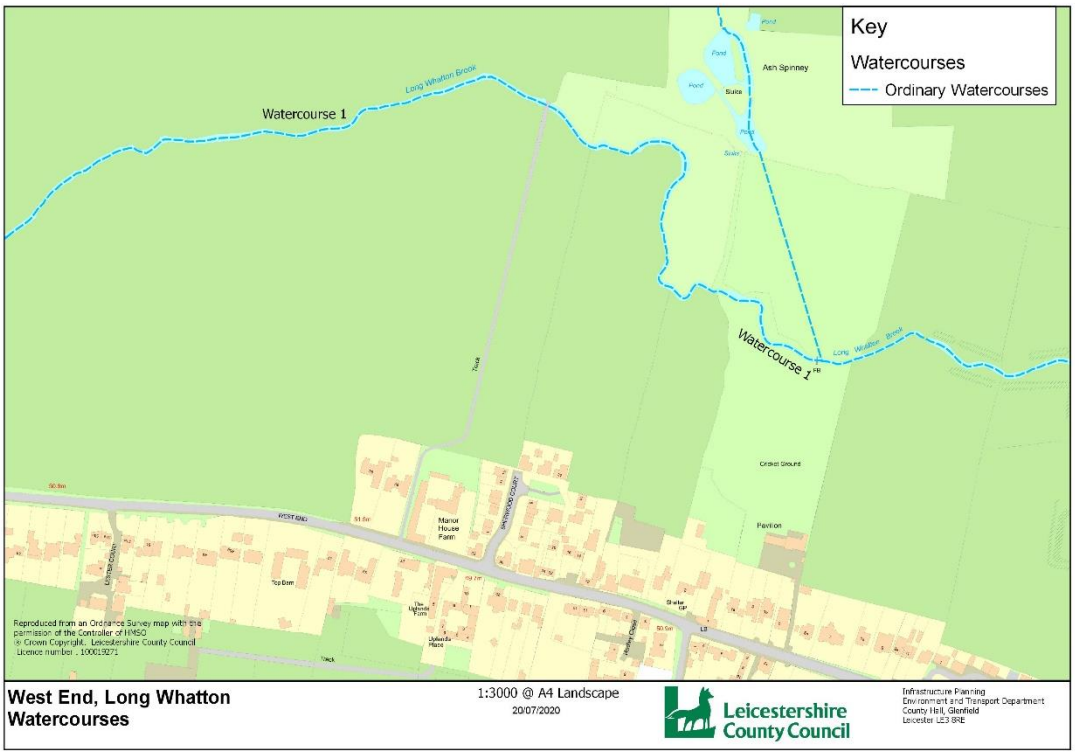


Figure 3: Location of Long Whatton Brook

Public sewer network

There is a combined sewer system, which conveys both foul and surface water flow, running west to east along West End towards a pumping station located at Mill Lane. This pumping station pumps water from the public sewer network towards the main Waste Water Treatment works at Hathern Road to the east. A foul sewer originates around the rear of No.14 West End and runs north-south between the access drives of No.16/20 before joining with the combined sewer in the middle of West End. There is also foul sewer running from Sherwood Court and this joins the above combined sewer in the junction of West End and Sherwood Court.

The public sewer network in this vicinity is owned and maintained by STW.

Highway drainage network

The local highway drainage network comprises traditional highway gullies and connections. The gullies on West End in the locality of this investigation flow towards Sherwood Court where they connect into an existing highway drainage run. This eventually discharges into the Long Whatton Brook. The Council are responsible for the maintenance of the highway drainage system on West End. The highway drainage system on Sherwood Court is currently unadopted[1]. ACO drainage is located at the

[1] As of August 2020.

top of the shared driveway of the property affected by the flood event and the neighbouring property. This drainage connects to the highway drainage described above on West End.

2.3. LANDSCAPE AND LAND HEIGHT

Long Whatton lies in a shallow basin in a generally low-lying landscape with the lowest point in the village at 44 metres above sea level. The underlying bedrock is predominately sedimentary mudstone formed in the Triassic Period (237-247 Ma). The catchment surrounding Long Whatton consists of open farmland and the Highways England maintained M1 motorway to the west of the village. The village is linear in nature, built along West End/Main Street (Figure 1).

2.4. HISTORICAL FLOOD INFORMATION

Prior to the events of 14th November 2019, the Council had been involved in an incident relating to flooding at the location.

In July 2015, the Council had completed works to the local highway (aco drainage installation and diversion of drainage into West End) and had installed a bung in the gully chamber at the top of the shared driveway of No.16/20 West End to prevent water from entering land drain A. These works were completed as a result of basic investigations at the time which identified an obstruction on land drain A.

3. The Flooding Incident – 14th November 2019

The majority of the information supporting the description of the flooding incident is based on first-hand accounts of affected residents collected from a number of public meetings.

3.1. INFORMATION PRIOR TO THE EVENT

The Meteorological Office (Met Office) reported that the UK had seen 68% of its average November rainfall by 17th November 2019 with the East Midlands being the wettest area in the UK that month. Leicestershire was reported to have had more than its average monthly rainfall total by the 17th. Data gathered by the 'Stormtrak' weather station in Mountsorrel, near Loughborough (located approximately 5 miles away) shows that November 2019 had higher rainfall than any other November in the previous decade (Figure 4).

Year	Rainfall (mm)
2019	115.5
2018	17.8
2017	30.6
2016	57.4
2015	53.8
2014	70.6
2013	38.0
2012	82.6
2011	17.8
2010	30.0
2009	70.4

Figure 4: Stormtrak weather station data showing rainfall in the month of November 2009-2019

(Source: https://www.stormtrack.co.uk/Pages/Rainfall-Days.aspx)

Time	Rainfall (mm)
04.00hrs-08.00hrs	0.4
08.00hrs-11.59hrs	8.0
12.00hrs-15.59hrs	10.8
16.00hrs-19.59hrs	1.4

Figure 5: Mount St. Bernard's rain gauge data for 14th November 2019

Source: www.gaugemap.co.uk

Rainfall data from the Mount St Bernard's Rain Gauge, located to the north-east of Coalville (located approximately 8 miles away), shows that 20.6 mm of rain fell in a 16-hour period between 04.00 and 20.00 on 14th November 2019. The most intense rainfall during that period occurred between 12.00-15.59 (Figure 5). This information correlates well with anecdotal reports.

Although very little rainfall was recorded in the two days prior to the flood incident, there had been more substantial rainfall over the five-day period of 7th-11th November 2019 and the ground was saturated. No flood wardens existed for this location and at the time and no emergency action plans existed. Therefore, no emergency actions/preparation such as warning the public were conducted.

3.2. DESCRIPTION OF THE EVENT – 14TH NOVEMBER 2019

On Thursday 14th November 2019 there was persistent rainfall throughout the day with approximately 21mm of rain falling on already saturated ground within the area (Figure 5). Sometime between 12.30hrs and 15.30hrs, between 100-150mm of contaminated water (murky brown and oily) flowed into the ground floor of the affected property (Picture 3). This concurs with the rain gauge data recorded as illustrated in Figure 5.

Resident and witness accounts on the day of the incident indicate that water was flowing down the driveway from West End and also from an inspection chamber on land drain 'A', located within the grounds of the property that flooded internally (Picture 3). During this event it was reported that an inspection chamber lid for the foul sewer was lifted and water was able to get away using this means.

Water was also identified to be running off a live construction site located opposite the shared driveway of the affected property. The muddy, silty nature of the water suggests that the water had run off the exposed groundworks relating to the construction works taking place (Picture 2). It has been reported that this water did not flow down the shared driveway towards the affected properties. Instead it caused extensive highway flooding at the junction of Sherwood Court and West End. There were also reports of water flowing from inspection chambers located within Sherwood Court (Picture 1). Figure 6 illustrates the surface water flow routes during the flood event of November 14th, 2019.

Pictures 1 & 2: Showing water surcharging from the inspection chamber in Sherwood Court (from a later flood event) and surface water flowing onto West End from the live construction site on 14th November 2019

Picture 3: Resident photo showing extent of internal flooding

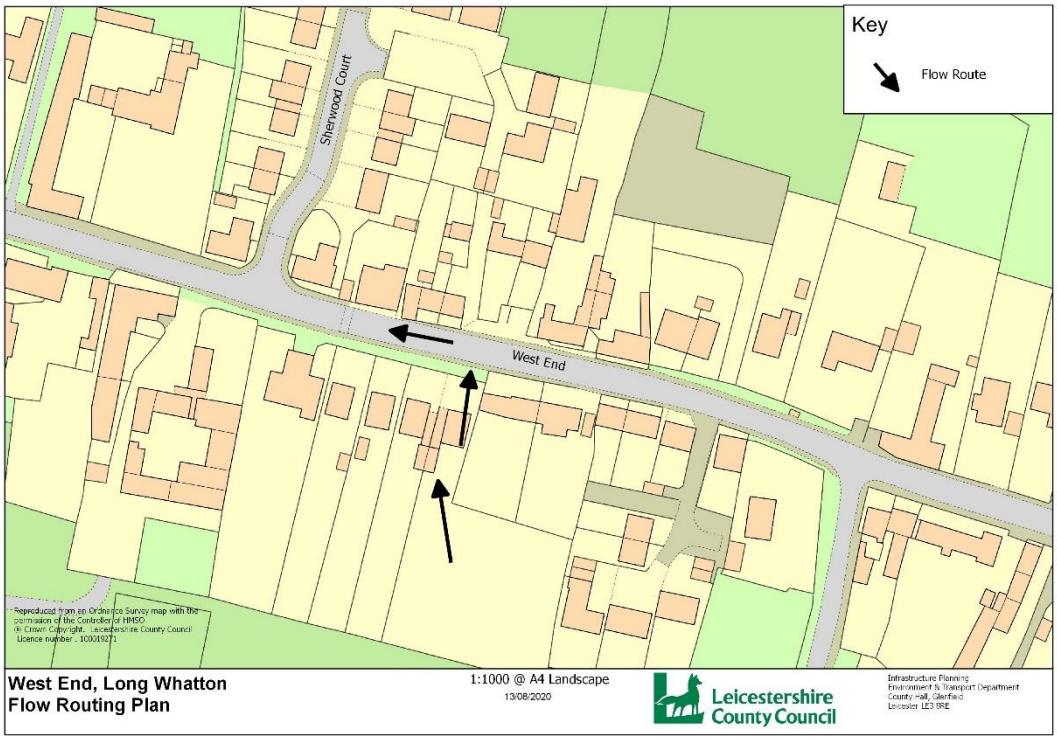


Figure 6: Surface water flow route off the minor development site

3.3. AFTER THE EVENT

Following the initial flood of the 14th November there have been a further three reports of internal flooding and various other occasions of external flooding. The three key events that resulted in flooding are:

- 20th December 2019 – Flooded driveway and frontages of Nos.16 & 20. Flooding to garage and first internal flooding event affecting No.16, affecting the utility room. Waste water entered No.20 via the rodding eye pipe. The depth of water on the ground floor of No.20 was approximately 170mm-205mm. The kitchen and all appliances were damaged and required removal.

- 16th February 2020 – External flooding as previous events and the second internal flooding event to No. 16. Waste water entered No. 20 via kitchen pipe. The depth of water on ground floor was approximately 205mm-230mm. The flooding extended through the rear boundary of No. 20 and into the garden of 10 Sherwood Court. All electrics, artificial grass and ground were damaged at No.20.

- 23rd February 2020 – Flooding to driveway to Nos. 16 & 20 and also to the immediate area around No. 16. Water is reported to have entered No. 20 between the ground floor and the walls. The depth of water was approximately 130mm and was reported to be clearer than in the previous flood events.

The Council has spoken with residents impacted by the flooding event and liaised with other RMAs to establish and further quantify the physical effects of the incident. There have been multiple site visits attended by the Council, the District Council, STW, the developer of Sherwood Court and the Parish Council. There has also been a range of actions that have taken place to help aid the understanding of why flooding occurred, and this includes:

1. **Actions linked to land drain A**

    - A misconnection of grey water from No.12 West End (likely made by the homeowner) has been removed from this system.

    - The highway gully at the top of the driveway of No.16/20 (connection into land drain A) has been removed. This chamber had previously been bunged in 2015 to prevent any flow down it. It is thought that this bung had become dislodged at the time of the flooding on 14th November 2019. The bung was subsequently re-fitted on 30th January 2020. This run now has no connection to the public highway.

    - All highway water is now conveyed towards West End into the existing highway system. This highway system has also been jetted. However, until works to the highway drainage system on Sherwood Court have been

completed[2], it likely that water from the highway system on West End will be unable to run as freely as expected.

- Surveying/camera/trace of the system has been completed from the chamber outside No.20 up to the highway chamber at the top of the drive. This concluded there were no additional connections coming in.

- Parts of the land drain have been exposed in the rear garden of No.20 and jetting/camera from the bottom end has been completed and has confirmed there are no other connections into this system. This land drain is shown to be leaking and damaged in parts. This activity took a while to complete due to the drain being silted and still having water in it.

- Dye testing of surrounding homes has also been completed to ascertain further private misconnections, but no further connections have been identified.

2. Actions linked to land drain B

- Jetting and a camera survey has been completed. The drain was traced to the boundary of No.16 and into the garden on 12 Sherwood Court. The camera did not make the full length but a sond identified the end of the run and this was further clarified by dye testing. Green dye was seen at the surface where the drain had been exposed and traced with the sond. A yellow 'X' in the garden of 12 Sherwood Court now marks the end of what was identified.

- Land drain B could not be traced upstream due to siltation.

- A private misconnection from 14 West End exists into this land drain by way of a connection into 16 West End's private drainage.

- It has been reported that through the investigation into the run of this land drain that one of the residents became infected with Campylobacter.

3. Actions linked to the public highway:

- As above, the highway now does not connect into land drain A.

- The ACO drains at the top of the shared driveway of Nos.16 & 20 have been cleansed and maintained as has all other highway infrastructure in the vicinity on West End. As mentioned above, until works are completed on the

[2] Outstanding action linked to a separate enquiry being investigated by the Council.

highway drainage system on Sherwood Court, the system on West End is unlikely to convey flows as would be expected[3].

4. **Actions linked to the STW public sewer network:**

- Any maintenance issues have been addressed within the surrounding public sewer network. This includes a of blockage identified in the combined sewer approximately 80m upstream from the Falcon public house in February 2020.
- A non-return valve has been fitted which serves the homes of both No.16 and No.20.
- A large storage tank has been installed in the driveway of No.16/20 to provide foul storage for the homeowners in the event of a further severe weather event. As a pre-caution, due to the future access challenges posed by the tank, the waste pipe for the tank was lined.
- Hydraulic modelling was conducted by STW to investigate the condition of the sewer network and the pumping station.

5. **Actions linked to the unadopted Highway (Sherwood Court)**

- A detailed survey of the surface water drainage system built to serve the Sherwood Court development was completed which also included other private drainage linked to the development.
- Surveying of the highway drainage system beneath the unadopted Sherwood Court was also completed.

6. **Actions linked to properties affected by the flooding**

- Surveys of properties have highlighted extensive internal flood damage to properties as well as long term damp issues[4]. A survey of No.20 identified significant damp issues where land drain A runs beneath.
- Surveys of private rainwater collection have highlighted inadequacies in terms of their ability to store water effectively.

The actions completed to date have therefore highlighted the following:

[3] Outstanding action linked to a separate enquiry being investigated by the Council.

4 Salts testing has confirmed the presence of nitrates in the lounge and dining room of No. 20. This is indicative of rising damp in the property since nitrates usually accumulate in quantities over prolonged time periods.

- Both land drains (A&B) are severed within plots of land developed as part of the Sherwood Court Development.

- Both land drains (A&B) have siltation issues but at the time of the flooding incident were likely able to convey flow, in some capacity, until the points where they are severed.

- The private surface water system (soakaway) linked with No.20 is inadequate in terms of sizing and proximity to property. It is also constructed on clay. However, the private surface water drainage system was not reported to have caused an issue before the November 2019 event.

- At the time of the flooding on 14th November 2019, the bung on land drain A had been dislodged and therefore a proportion of highway water (and a small quantity of grey water from a misconnection) was draining down this system. The Council has a historic right of discharge into this land drain but it was only a proportion of highway water as the majority of highway water is conveyed into a system within West End down towards Sherwood Court. As previously stated, this highway connection has now been removed.

- STW identified a obstruction within the combined sewer on 24th February 2020 approximately 480m downstream from the properties affected by the flood event on 14th November 2019. This obstruction was reported to be approximately 80m in length and was removed by STW on the same day. It is not known if this blockage existed at the time of the flooding on 14th November. It is possible that an obstruction existed (given the nature of the blockage) but the degree of the obstruction is unknown. Hydraulic modelling (conducted after the event) suggests that a restriction/obstruction at this point increases the risk of sewer flooding to a small number of properties on West End. However as previously mentioned it is not known if or to what extent this obstruction existed. At the time of the flooding on 14th November, the obstruction was not known to exist as there were no indicators of its existence until 23rd February 2020 when a property closer to the obstruction externally flooded for the first time. It was therefore only removed at this time. It is thought that this obstruction likely got progressively worse (in the Winter of 2019/20) and may have exacerbated the flooding extent but was not the cause of the flooding on 14th November as the opening of a foul chamber on 14th November improved the flooding situation.

- The hydraulic modelling conducted by STW highlighted a capacity deficiency in the sewer network. This deficiency increases the risk of flooding in the 5 year event to a small number of properties on West End. The sewage pumping station located on Mill Lane is assumed to discharge at a rate of 18 l/s, but during periods of prolonged heavy rain is overwhelmed and results in the backing up of the sewage network. The sheer volume of water that fell in the

lead up to and on the 14th November overwhelmed the sewer network and thus the sewage network backed up the system into the pipe network.

- Campylobacter exists and is likely sourced from land drain B. This is possibly linked to stagnant water (due to it being severed) and contaminated water getting into this land drain following the flooding events between November 2019 and February 2020.

- The long term damp issues identified for No.20 are most likely linked to land drain A being severed and so water was unable to get away and sat beneath the property.

Anecdotal reports suggest that land drain B had previously discharged into Long Whatton Brook and was of a brick arch construction. This information had been reported anecdotally to the Local Planning Authority in December 2007 expressing concerns that this land drain would be damaged during the construction of Sherwood Court development. A review of historical mapping has not identified any watercourses near Sherwood Court/West End in addition to Long Whatton Brook. However, these records are not a complete dataset and it is common that small land drains are not recorded on electronic datasets.

Though the investigation, anecdotal reports raised concerns that recent works conducted by STW may be linked to the flooding on 14th November 2019. STW has confirmed that works were completed to address a collapse in the combined sewer on West End in Spring 2019, close to the junction with Sherwood Court. High septicity levels being discharged from the pumping station had caused erosion in the sewer network and thus this collapse. In March 2019, a chemical unit was commissioned at the pumping station to neutralize the septicity. A section of the sewer in Long Whatton, running east from the junction of Sherwood Court to approx. No. 12 West End was then re-lined. The section of sewer running west from the M1 to the junction with Smithy Lane was also inspected via CCTV and no collapses or other defects were found at the time. The works to resolve the septicity issue were conducted in Spring 2019 and are therefore unrelated to the flooding of 14th November 2019. STW had also been engaged following foul flooding to properties in Sherwood Court in the summer of 2019. In late November 2019, a non-return valve (NRV) was fitted to the foul water sewer in Sherwood Court, close to the junction with West End, to prevent external flooding to properties. New manhole covers have also been installed in three properties on Sherwood Court. The fitting of the NRV occurred after the 14th November 2019 therefore evidencing that this work was not linked to the flood event.

A review of surface water flood risk mapping (Figure 7) shows a risk of surface water flooding along Sherwood Court, however there is no risk predicted along West End in that location. This mapping does not highlight the reported flow path of water flowing off an active development site opposite the shared driveway of the affected properties. This mapping is unable to pick up local flow paths in some instances and is only

intended for use at a wider scale. It also suggests that the live construction works may have altered local surface water flow paths.

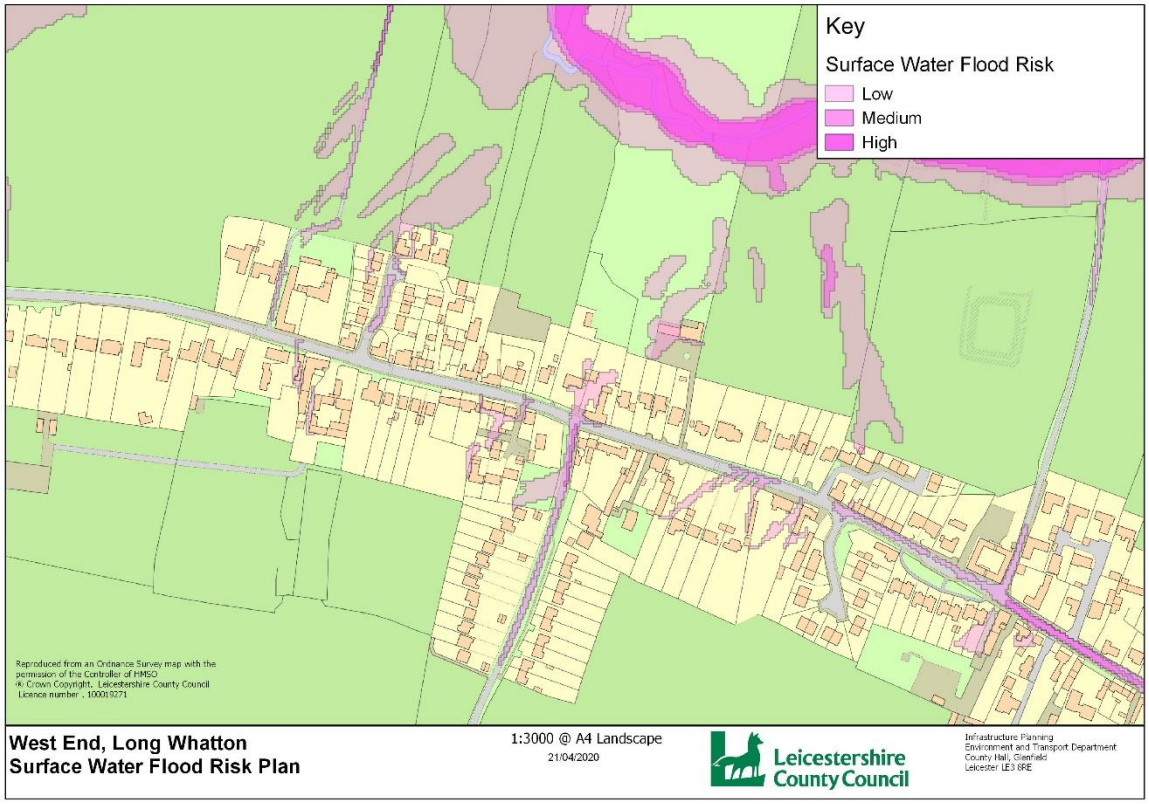


Figure 7: Surface water flood risk for West End and Sherwood Court

4. SUMMARY OF IMPACTS AND FINDINGS

Ordinary Watercourse	Main River	Surface Water	Groundwater	Public Sewer	Canal	Highway Drainage
☑	☐	☑	☑	☑	☐	☑

Summary of flood sources

Residential	Business	Other Buildings	Roads	Critical Infrastructure
At least 1	0	0	West End and Sherwood Court	0

Receptors impacted

Due to the varying factors that are linked to the flood event of 14th November it is not possible to explicitly identify an exact cause of the flooding. The result of the combination of factors described below was the ingress of flood water to at least one residential property at West End, Long Whatton on 14th November 2019:

- The catchment and subsoil at the location was saturated as a result of the intense wet period that extended intermittently from September 2019 – March 2020. Any water entering the ground during this period simply had nowhere to drain to.
- The intense rainfall event on 14th November resulted in large quantities of water in a short space of time, falling on an already saturated catchment and this quantity of water overwhelmed the local drainage system and the water had nowhere to go.
- The shared driveway of the affected property slopes down towards the property and would have directed any overland flow falling on the driveway to the local low point (the property).
- Any water that entered land drains A&B was unable to effectively drain away as they are severed. Water flooded out of the inspection chambers outside of No.20 and No.16 (the low point) and eventually reached such a depth that it breached the property threshold. It is thought that up until this point that water had just seeped out of the drains and into the surrounding ground.
- During the flooding event of 14th November, it was reported that residents opened a foul inspection chamber and thus allowing water to get away into the public sewer network. It was reported that this eased the situation for a while but eventually foul water backed up and then also flooded out of this chamber

too (linked to the sheer volume of water which overloaded the pumping station and thus backed up throughout the public sewer network).

There are many factors that may have exacerbated the impacts of the flood event. Whilst these factors may have made a difference to the volume and peak flood levels, at the time of writing this report, there is no firm evidence that these factors would have prevented any of the internal flooding experienced by this event. These factors include:

- Land drains A and B requiring some maintenance to be fully functioning.
- The bund being dislodged from land drain A and highway water (and small volumes of grey water from misconnections) travelling down the drain.
- Highway gullies requiring maintenance.
- The shock of the event and lack of preparedness.
- A restriction within STW combined sewer network 480 metres downstream of the affected properties would have restricted flow of combined waste away from the properties. However, it is not known if this restriction was present at the time of the flood event or to what degree the restriction existed to.
- The affected homeowners private surface water soakaway is constructed on clay and is not designed to the industry standard levels.

The live construction site opposite the affected properties had altered land levels which in turn has altered local surface water flow routes. During the intense rainfall event, silt and water flowed off the steep access drive onto West End where it ran along the road in the direction of Sherwood Court. This water caused extensive highway flooding on West End/Sherwood Court but did not exacerbate the issues experienced by the homeowners.

Through the course of the investigation, it was also identified that at least one of the affected properties has suffered long term damp issues linked to land drain A. It was identified that water cannot get away effectively as it has been identified to be severed in the land of No.10 Sherwood Court.

It has also been identified that Campylobacter now exists in the locality. Land drains A&B (Pictures 5-7) are currently severed and so any water that enters them will remain stagnant as there is nowhere for it to go except the ground (at a slow rate).

Picture 5: Water collecting in Land Drain A (No. 20) due to the drain being severed to rear of the property in Sherwood Court

Picture 6: Water collecting in Land Drain B due to drain being severed where it leaves the property (No.16) and meets the property to the rear on Sherwood Court

Picture 7: Yellow 'X' denotes location where Land Drain B running from No. 16 West End is severed at property to the rear in Sherwood Court

5. RESPONSIBILITIES

5.1. RIPARIAN LANDOWNERS OF WATERCOURSES

According to National Government advice on 'Owning a Watercourse', riparian landowners have certain rights and responsibilities including:

- They must maintain the bed and banks of their watercourse, and also the trees and shrubs growing on the banks;
- They must clear any debris, even if it did not originate from their land. This debris may be natural or man-made;
- They must keep any structures that they own clear of debris. These structures include (but are not limited to) culverts, trash screens, weirs and mill gates.

All riparian owners have the same rights and responsibilities. These responsibilities include the requirement to keep any structures, such as culverts, trash screens, weirs and mill gates clear of debris". However, a landowner has no duty in common law to improve the drainage capacity of watercourse he/she owns.

A full explanation of the rights and responsibilities of riparian ownership are given online at https://www.gov.uk/guidance/owning-a-watercourse

5.2. INDIVIDUAL HOMEOWNERS

Local residents and tenants who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected.

Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include; signing up to Flood Warning Direct (if available), nominating a community flood warden, producing a community flood plan, implementing property level protection and moving valuable items to higher ground. More permanent measures are also possible such as; installing floodgates, raising electrical sockets, and fitting non-return valves on pipes.

5.3. NORTH WEST LEICESTERSHIRE DISTRICT COUNCIL

North West Leicestershire District Council has powers under Section 14 of the LDA to undertake flood risk management works on ordinary watercourses (excluding Main Rivers), where deemed necessary. Under Section 20 of the LDA, North West Leicestershire District Council has the powers (by agreement of any person and at their expense) to undertake drainage work which that person is entitled to carry out and maintain.

5.4. LOCAL HIGHWAY AUTHORITY (LEICESTERSHIRE COUNTY COUNCIL)

The Council are also defined as the local Highway Authority and has a duty to maintain the public Highway under Section 41 of the Highways Act (1980).

Section 100 states that the Council also has the responsibility and power to prevent water running onto the highway from adjoining land.

5.5. WATER COMPANY (SEVERN TRENT WATER)

Water and sewerage companies are responsible for managing flood risk related to surface water, foul water and combined sewer systems. Public sewers are designed to protect properties from flood risk in normal wet weather conditions. In extreme weather conditions, however, there is a risk of these public sewers being overwhelmed, resulting in sewer flooding.

Following the 'Private Sewer Transfer' on 1st July 2011, water companies are now responsible for all pipes systems on private land that serve more than one curtilage and are connected to a public sewer. Under Section 94 of the Water Industry Act (1991) statutory sewerage undertakers have a duty to provide sewers for drainage of buildings and associated paved areas within property boundaries.

Water companies are responsible for all public sewers and lateral drains. Public sewers are a conduit (typically a pipe) assigned to a water and sewerage company that drains two or more properties; conveying foul, surface water or combined sewerage to a positive outfall. Connection of other drainage sources to public sewers is discretionary following an application to connect.

5.6. LLFA (LEICESTERSHIRE COUNTY COUNCIL)

The Council has a range of statutory duties under the FWMA, 2010 including the responsibility to coordinate the management of local flood risk across Leicestershire.

As stated previously, the Council has a duty to investigate flood incidents under Section 19 of the FWMA. Publication of this report is the conclusion of that process.

The LLFA also has a responsibility to maintain a register of drainage assets which are considered to provide a significant role in the mitigation of flood risk (as detailed within Section 21 of the FWMA). The register must contain a record detailing each structure or feature including ownership and state of repair. The Council look for support and information from other RMAs to ensure any assets which could potentially have a significant effect on flood risk are recorded on the asset register.

The Council also has permissive enforcement powers related to ordinary watercourses within private ownership. The duty to maintain the ordinary watercourses on private land however rests with the relevant riparian landowner.

6. AGREED ACTIONS OF RMAS

6.1. LEICESTERSHIRE COUNTY COUNCIL

The Council has agreed/undertaken the following actions:

- To continue to coordinate the investigation into the flooding and work closely with all RMAs, the developer of Sherwood Court and the local community to understand the event of the 14th November 2019 (and the subsequent flood events) to help mitigate any future flooding where possible.
- Cleansing of the highway gullies on West End and has carried out works to remove any highway connectivity into land drain A.
- Assisted the local residents with various acts of cleansing and surveying of land drains within private property on West End. This has helped to identify various defects, blockages and issues within the local drainage network.
- To continue to work with local residents to ensure that any riparian land owners are fully aware of their legal duty and maintenance requirements. The Council will consider the use of its permissive powers under Section 25 of the LDA where appropriate.
- To continue to work with homeowners to help them be better prepared for potential future flood incidents including working with STW to ensure flood resilient products are installed to affected properties.
- Assisted in helping the affected residents obtain available grants to aid their recovery from the flooding through NWLDC.
- Assisted STW with the dye testing of surrounding properties to help understand possible connectivity of any private drainage into land drains A&B.
- To engage with NWLDC regarding the development opposite the affected properties in an attempt to ensure that surface water is managed effectively during the construction and for the lifetime of the development where appropriate.

6.2. SEVERN TRENT WATER

STW has agreed/undertaken the following actions:

- To continue to work collaboratively with all RMAs to progress the investigation into the flooding to understand the event of the 14th November 2019 (and the subsequent flood events) to help mitigate any future flooding.
- Assisted in ensuring the ‘misconnection’ from No.12 West End was removed from land drain A.
- To assist in ensuring that the property affected by internal flooding on 14th November (and subsequent flood events) is made more flood resilient by

agreeing to fund the installation of flood resilient doors to the front and rear of No. 20 West End.

- Coordinated and conducted dye testing of surrounding properties to help understand possible connectivity of any private drainage into land drains A&B.
- Constructed a storage tank in the driveway of No.16/20 to provide additional foul storage for the homeowners in the event of a further severe weather event.
- Installed a new manhole containing a non-return valve protecting Nos.14, 16 and No.20 West End.
- Provided a 'Jet Vac' unit to empty water from highway gully whilst the residents at No.12 West End were waiting for parts to rectify the grey water misconnection to land drain A during the Covid 19 lockdown period.
- Conducted hydraulic modelling of the sewer network and pumping station.
- Fitted a NRV on the foul sewer in the shared driveway of No.16/20 to stop foul water entering this way in the event that the pumping station is overloaded and water backs up the sewer system. Also, measures have been fitted internally to No.16 to add an extra layer of protection.

6.3. NORTH WEST LEICESTERSHIRE DISTRICT COUNCIL

The District Council has agreed/undertaken the following actions:

- To progress the investigation into the identification of Campylobacter as appropriate.
- Assisted the affected residents by obtaining national grant funding to aid their recovery from the flooding.
- To engage with LCC regarding the development opposite the affected properties in an attempt to ensure that surface water is managed effectively during the construction and for the lifetime of the development where appropriate.

7. SOURCES OF INFORMATION

The following information has contributed to this report:

- A high number of emails, photos, videos and reports kindly issued by the local residents.
- Verbal information received from public meetings attended by the Council
- Multiple ad hoc and arranged site visits unaccompanied or accompanied by the developer of Sherwood Court, STW, the Council and affected residents.
- Flood Forecasting Centre and Met Office statements and warnings.
- Rainfall data collected at the Stormtrak weather station in Mountsorrel.

8. STATUS OF REPORT AND DISCLAIMER

This report has been prepared pursuant to the Council's statutory responsibility, under the FWMA, to investigate flood incidents in its area. The statutory duty to investigate is not absolute or exhaustive. Under Section 19 of FWMA, the Council's statutory responsibility is limited to conducting investigations only to the extent the Council deems it necessary.

Where the Council deems it necessary to conduct an investigation, it is required to address two questions under 19(1) of the FWMA. Firstly, the Council is required to identify relevant "Risk Management Authorities"[5]. Secondly the Council is required to investigate whether the Risk Management Authorities have exercised, or are proposing to exercise, flood risk management functions set out under Section 4 of FWMA.

The relevant flood risk management authorities identified by the Council are defined at Section 1.4 of the body of this report. The flood risk management functions which the Risk Management Authorities are proposing are described at Section 6 of the body of this report.

Beyond discharging the specific statutory responsibilities under Section 19(1) of FWMA, the intended purpose of this report is solely as a resource to assist Risk Management Authorities and stakeholders to better understand the relevant flooding incident and to mitigate risks going forward.

Although the Council has commented upon contextual issues related to the flood event, it is not the purpose of this report to determine any private rights arising from the flood event.

Nor is the purpose of this report to reach conclusions as to whether any Risk Management Authority or other stakeholder *(e.g. private land owners, public bodies or government agencies)* has breached any duty of care *(whether statutory or common law)* that they may have held.

The Council has, in good faith, sought to locate and collate relevant primary and secondary evidence to prepare this report. However, the Council accepts no responsibility for assumptions or statements made on the basis of evidence which incomplete, inaccurate or both. As such, this report should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The Council expressly disclaims responsibility for any error, omission or negligent misstatement in this report to the fullest extent permissible in law.

[5] *As defined by Section 6(13) of FWMA*

Further the Council does not accept any liability for the use of this report or its contents by any third party. Where any party wishes to assert any rights or cause of action related to the flooding event they are requested to rely on their own investigations.

Glossary

Acronyms / Term	Definition
AEP	Annual Exceedance Probability
AW	Anglian Water
EA	Environment Agency
FWMA	Flood and Water Management Act 2010
IDB	Internal Drainage Board
LCC	Leicestershire County Council
LDA	Land Drainage Act 1991
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
Main River	Those watercourses for which the Environment Agency is the relevant RMA
Ordinary watercourse	Any watercourse that is not a Main River, and the LLFA, District / Borough Council or IDB is not the relevant RMA
RMA's	Risk Management Authorities
STW	Severn Trent Water
The Council	Leicestershire County Council
uFMfSW	updated Flood Map for Surface water
WRA	Water Resources Act 1991