

Derbyshire County Council Section 19 Investigation Report – Storm Babet 18/10/23 – 21/10/23

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Derbyshire Section 19 Flood Reports
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Executive summary

Storm Babet brought exceptional rainfall to much of the United Kingdom (UK) from the 18th to the 21st of October, 2023. According to the Met Office, Storm Babet tracked north while approaching the UK, enabling it to acquire additional moisture while crossing the Bay of Biscay. This was an unusual tracking route since most autumn and winter storms track west to east, driven by the jet stream. Upon reaching the UK, Storm Babet was unable to clear eastwards into the North Sea due to a blocking area of high pressure across Scandinavia. As a result, the rain-bearing fronts remained stationary across eastern Scotland for a prolonged period before moving back across England and Wales. At least 100mm of rainfall fell across a large proportion of the UK, with the Midlands receiving its wettest 3-day period on record.

There were slight local variations in rainfall patterns across Derbyshire, with rainfall generally persisting from late on the 18th of October to early on the 21st of October, peaking at some point during the morning of the 20th of October. Recorded lag times between peak rainfall and peak river flow across Derbyshire ranged from 7 to 27 hours. Therefore, peak river flows were recorded either on the 20th of October or early on the 21st of October. Estimated rainfall rarities for sixteen rainfall gauging stations across Derbyshire range from 25% Annual Exceedance Probability (AEP) to a 0.3% AEP, with an average AEP of 4.4%. Note that AEP refers to the chance of an event being exceeded in any given year, expressed as a probability.

Derbyshire County Council recorded 1,647 properties in Derbyshire to have been internally flooded between the 18th and 21st of October, 2023. The worst impacted communities included those in Chesterfield, Sandiacre and Long Eaton. Of these internally flooded properties, 1,251 were residential and 396 were non-residential. The main cause of property flooding at most communities was watercourse overtopping. Surface water flooding was the main cause of flooding at a minority of communities and a contributing cause of flooding at many others. There are some instances of flooding from sewer networks; however, in the majority of cases this was as a result of pumping stations being overwhelmed by flooding from other sources.

The worst of the property flooding generally occurred in the east of the Derbyshire. The Don and Rother, the Derwent Lower, and the Erewash catchments experienced higher concentrations of flooded properties than catchments to the west of the county. This was a result of higher magnitude rainfall events concentrated to the east of the catchment combined with areas with higher population densities such as Chesterfield and Ilkeston.

Following the flood events, and in addition to supporting this investigation, each authority has undertaken surveys, investigations and has provided further community support. This has included the provision of Property Flood Resilience grant funding, the freezing of council taxes for those affected, culvert and sewer surveys, and repairs and blockage removal.

This report documents the investigation into Storm Babet flooding across Derbyshire, undertaken on behalf of Derbyshire County Council, as mandated under Section 19 of the Flood and Water Management Act 2010. Based on an agreed criteria of five internally flooded residential properties within a community, Derbyshire County Council has identified thirty-five communities for investigation which encompass 1,284 of the 1,647 properties that were internally flooded during Storm Babet. The aim of the investigation is to identify the cause of flooding at these communities and review responses to the event. It is not the purpose of this investigation to assess flooding mechanisms in detail, however a summary of the current understanding of flood event impacts and mechanisms is provided for each community under investigation.

The report provides a summary of immediate and post-event responses undertaken by Risk Management Authorities which are applicable to all communities and the specific responses to individual communities. Finally, the report provides a summary of ongoing and potential future actions to be implemented by various risk management authorities at different communities.

Purpose, use, sources of information and limitations of this report

The sole purpose of this report is to provide Jacobs' client, Derbyshire County Council, a report of the investigation undertaken into the Storm Babet flooding that occurred across the council's administrative area in October 2023. This document has been prepared on behalf of, and for the exclusive use of Derbyshire County Council, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and Derbyshire County Council. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

The data within this report is derived from multiple sources including Derbyshire County Council, its partners, Jacobs, and its suppliers. The data sourced from the Derbyshire County Council, its partners, and Jacobs' suppliers, which the recommendations and conclusion within this report rely upon, is done so on the assumption that the data requested reflects all available data and is accurate.

Certain statements made within this report that are not historical facts may constitute estimates or anecdotal evidence and though they are based upon reasonable and qualified assumptions at the date of reporting, such statements have inherent risk and uncertainty.

1. Introduction

1.1 Flood Event Overview

Between the 18th and the 21st of October 2023, Storm Babet brought extreme rainfall to much of the United Kingdom (UK). England and Wales experienced its third-wettest independent 3-day period since 1891. In England, significant flooding was observed across Derbyshire, as well many other areas including Yorkshire, Nottinghamshire, Staffordshire and Suffolk. Rainfall in the Midlands was particularly severe, recording its wettest 3-day period on record.

In Derbyshire, 1,647 properties were internally flooded across all eight of its districts and boroughs. The impact of Storm Babet was particularly severe in some communities. In Chesterfield, for example, one resident lost their life and more than 400 properties flooded internally. Derbyshire County Council recorded infrastructure damage across the county, including bridge scouring, electricity substation damage, and a footbridge that was washed away. In addition, several roads became impassable, causing local traffic disruption.

Leading up to the event, Derbyshire experienced a period of wet weather in early October, having experienced 90% of the long-term average October rainfall in the first 17 days of the month. This caused elevated water levels in many watercourses. The primary cause of flooding was due to exceptional rainfall intensities falling on already saturated ground, increasing the water levels of already elevated watercourses, leading to a combination of flooding from rivers, surface water and drainage networks. These sources of flooding vary between communities in Derbyshire, with flooding in some communities occurring because of one of these sources, and at others, because of a combination of two or three.

In response to the events, Derbyshire County Council, district and borough councils, the relevant water and sewerage companies and the Environment Agency, as Risk Management Authorities (RMAs), have been working together with emergency services and community organisations to support affected communities and to understand what happened. Actions undertaken by these groups include:

- responding to flood incidents both during and after the event;
- undertaking flood investigations;
- undertaking management and maintenance works;
- engaging with communities throughout the county by holding numerous drop-in events to provide information and support to those affected; and
- supporting the delivery of financial support schemes including the Property Flood Resilience Scheme, in which properties affected could apply for up to £5000 worth of property level protection and resilience.

1.2 Section 19 Investigation Requirements

The [Flood and Water Management Act 2010](https://www.legislation.gov.uk/ukpga/2010/29/contents) (<https://www.legislation.gov.uk/ukpga/2010/29/contents>), herein referred to as 'the Act', places several duties on the Lead Local Flood Authority (LLFA) in relation to local flood risk management. Derbyshire County Council is the relevant LLFA here. One of the principal duties of the LLFA, as laid out in the Act, is the responsibility to record and investigate flooding incidents within their area, herein referred to as a Section 19 Investigation.

Section 19 of the Act, which is titled 'local authorities: investigations', states that the LLFA must investigate which RMAs have relevant flood risk management functions. It must also investigate whether each of those RMAs has exercised, or is proposing to exercise, those functions in response to the flood. The LLFA must publish the result of its investigation and notify any relevant RMA.

1.3 Report Purpose

The aim of this investigation is to provide a factual record of the flooding events that occurred because of Storm Babet from the 18th to the 21st of October 2023. This is to meet the requirements of Section 19 of the Act.

Technical evidence and flood incident data have been recorded by Derbyshire County Council and other RMAs during and after the event. Based on this information, the investigation attempts to determine the source and summarise the impact of flooding in each community badly affected. The impacts include those on people, properties and critical infrastructure and services like hospitals, roads, railways and utilities.

In many locations, there are ongoing studies and engagement with the affected communities and stakeholders to identify the full range of options available to manage flood risk going forward. It is not the intention of this investigation to provide options and actions to reduce flood risk for each location that flooded. It does include, where relevant, high-level recommendations to manage future flood risk in Derbyshire, which will require involvement from Derbyshire County Council, as LLFA, and the other RMAs within the county.

This investigation is an important first step to help Derbyshire County Council and other RMAs manage flood risk. This includes informing future schemes, supporting communities to be more resilient to flooding and helping organisations to continue to work together proactively and effectively across Derbyshire.

1.4 Scope

This report has investigated individual instances where five or more residential properties have been flooded within a community throughout Derbyshire County Council's administrative area. This criterion is based on one of the thresholds set out in the council's [Local flood risk management strategy](https://www.derbyshire.gov.uk/environment/flooding/strategy/local-flood-risk-management-strategy.aspx) (<https://www.derbyshire.gov.uk/environment/flooding/strategy/local-flood-risk-management-strategy.aspx>) published in June 2023 which is used to trigger a formal flood investigation.

Instances of five or more internally flooded residential properties have been determined using an analysis in a Geographical Information System (GIS). GIS is computer software that helps to view and analyse spatial information such as patterns of flooding. The analysis identified five or more internally flooded residential properties within a 300m distance of each other as a 'community' which requires investigation. Based on this method, 35 communities consisting five or more flooded residential properties have been identified. Therefore, of the 1,647 flooded properties that were internally flooded in Derbyshire, this report focuses on communities that contain 1,284 of these.

1.5 Risk Management Authorities Roles and Responsibilities

The responsibilities for managing flooding in England and Wales is divided between different RMAs as defined in the Act. RMAs have powers and duties to manage the different forms for flooding that can occur. Although each RMA has their own responsibilities, managing local flood risks often requires RMAs to work together.

The Act and Derbyshire County Council's Local Flood Risk Management Strategy (LFRMS) provide a full description of RMAs responsibilities. The sections below describe the RMAs relevant to this flood investigation.

1.5.1 Environment Agency

The Environment Agency has a strategic overview of all sources of flooding and coastal erosion in England. It is also responsible for flood and coastal erosion risk management activities on designated statutory main rivers and the coast, regulating reservoir safety, and working in partnership with the Met Office to provide flood forecasts and warnings. Statutory main rivers are defined by government here: <https://www.gov.uk/government/collections/main-river-map-for-england-proposed-changes-and-decisions>. Herein, statutory main rivers are referred to as main rivers.

Roles undertaken by the Environment Agency include, but are not limited to:

- developing and applying the National Flood and Coastal Erosion Risk Management Strategy for England (<https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england--2>);
- allocating national Government funding to projects to manage flood and coastal erosion risks from all sources;
- delivering projects to manage flood risk from main rivers and the sea;

- providing evidence to support others, including national flood and coastal erosion risk information, data and tools to help other RMAs and to inform Government policy;
- providing advice to support others, including advice on planning and development issues; and
- working with others to share knowledge and the best ways of working, including work to develop skills and resources.

1.5.2 Derbyshire County Council

Derbyshire County Council has an overarching strategic coordinating role in managing local flood risk from surface water, ordinary watercourses and groundwater sources. Ordinary watercourses are rivers that are not designated as main rivers. Under the Act, Derbyshire County Council's roles and responsibilities include:

- developing and applying a LFRMS for its area (see Section 9 of the Act);
- developing a register of structures or features that might affect flood risk (see Section 21 of The Act);
- having the power to undertake works for managing flood risk and power to take enforcement action where there is an obstruction to an ordinary watercourse (Section 25 of the Land Drainage Act 1991 (<https://www.legislation.gov.uk/ukpga/1991/59/contents>));
- investigating flooding (see Section 19 of the Act) to a locally derived threshold for a minimum scale of flood event required before an investigation is to take place (see sub-section 1.4); and
- an overseeing role to ensure that RMAs and landowners are fulfilling their responsibilities adequately.

Derbyshire County Council is also the Highways Authority within its administrative area and has a duty under the Highways Act (1980) to drain the local highway network of surface water where it creates a nuisance. They are not, however, responsible for trunk road drainage (see sub-section 1.5.5).

Derbyshire County Council is responsible for preparing and planning for emergencies as part of the Civil Contingencies Act 2004. Its responsibilities and duties under this act include:

- assessing the risk of emergencies occurring and using this to inform contingency planning;
- putting in place emergency plans and business continuity management arrangements;
- putting in place arrangements to make information available to the public about civil protection matters and maintain arrangements to warn, inform and advise the public in the event of an emergency;
- sharing information with other local responders to enhance co-ordination;
- co-operating with other local responders to enhance co-ordination and efficiency; and
- providing advice and assistance to businesses and voluntary organisations about business continuity management.

1.5.3 District and Borough Councils

Eight district or borough councils are within the Derbyshire County Council administrative area (see Figure 1-1). They are designated as Land Drainage Authorities under the Land Drainage Act 1991. They have powers under Section 14 of this Act to enter land and undertake works to alleviate flood risk.

Several key teams in the district and borough councils liaise with Derbyshire County Council, as the LLFA, to manage flood risk. The teams and their duties relating to flood risk are:

- The local planning teams within local planning authorities as defined in the Town and Country Planning Act 1990 (<https://www.legislation.gov.uk/ukpga/1990/8/contents>), which liaise with the LLFA to promote sustainable planning and development;
- Environmental health teams, who have general powers to serve notice on landowners to undertake remedial action on water related issues, which could be considered a risk to health or a nuisance, under the Public Health Act 1936 (<https://www.legislation.gov.uk/ukpga/Geo5and1Edw8/26/49/contents>);
- Parks or open space teams are responsible for the maintenance of public open space, which in some instances is used to accommodate flood water; and
- Flood risk and drainage teams are responsible for undertaking regular or reactive maintenance on watercourses where they are the relevant landowner.

Figure 1-1 shows the operating areas of district and borough councils within the administrative area of Derbyshire County Council. The district and borough councils located within Derbyshire are as follows:

- Amber Valley Borough Council
- Bolsover District Council
- Chesterfield Borough Council
- Derbyshire Dales District Council

- Erewash Borough Council
- High Peak Borough Council
- North East Derbyshire District Council
- South Derbyshire District Council

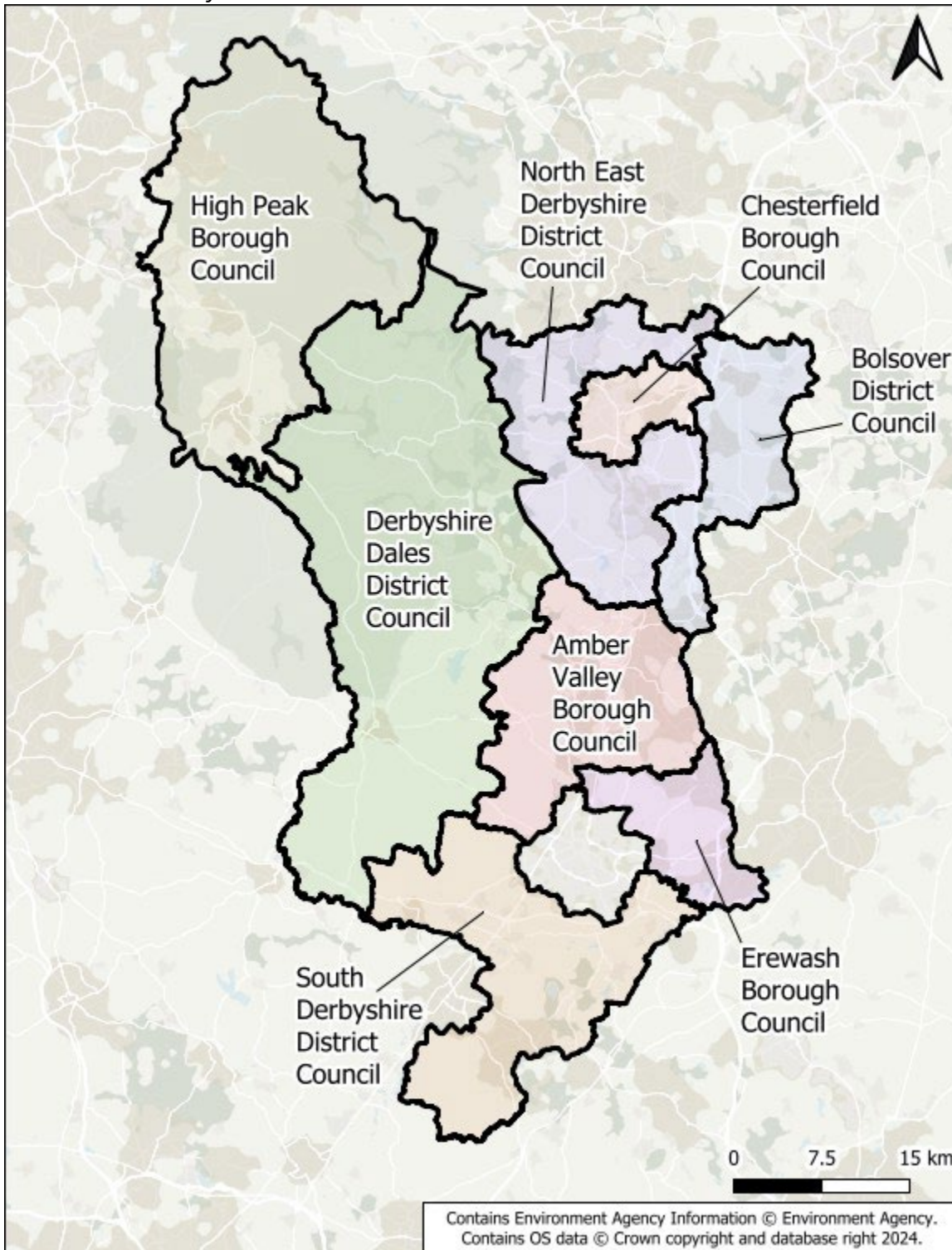


Figure 1-1: District and borough councils within the administrative area of Derbyshire County Council

1.5.4 Water Companies

Water companies have a duty under Section 94 of the [Water Industry Act 1991](https://www.legislation.gov.uk/ukpga/1991/56/contents) (<https://www.legislation.gov.uk/ukpga/1991/56/contents>) to provide and maintain sewers for the drainage of buildings and associated paved areas within property boundaries. They are also responsible for transferred sewers under the 'Transfer of Private Sewer Regulations 2011' and lateral drains, which connect with the public sewers.

Derbyshire is serviced by four water companies who manage the surface water, foul water and combined public sewer network throughout the county and neighbouring authorities. These are Yorkshire Water, Severn Trent Water, United Utilities and South Staffs Water (see Figure 1-2).

With regards to local flood risk management, they are responsible for any flooding which is directly caused by their assets such as water or sewerage pipes and must maintain a register of properties that have flooded due to insufficient hydraulic capacity of the sewerage network. Under the Act, they have a duty to cooperate with other relevant authorities.

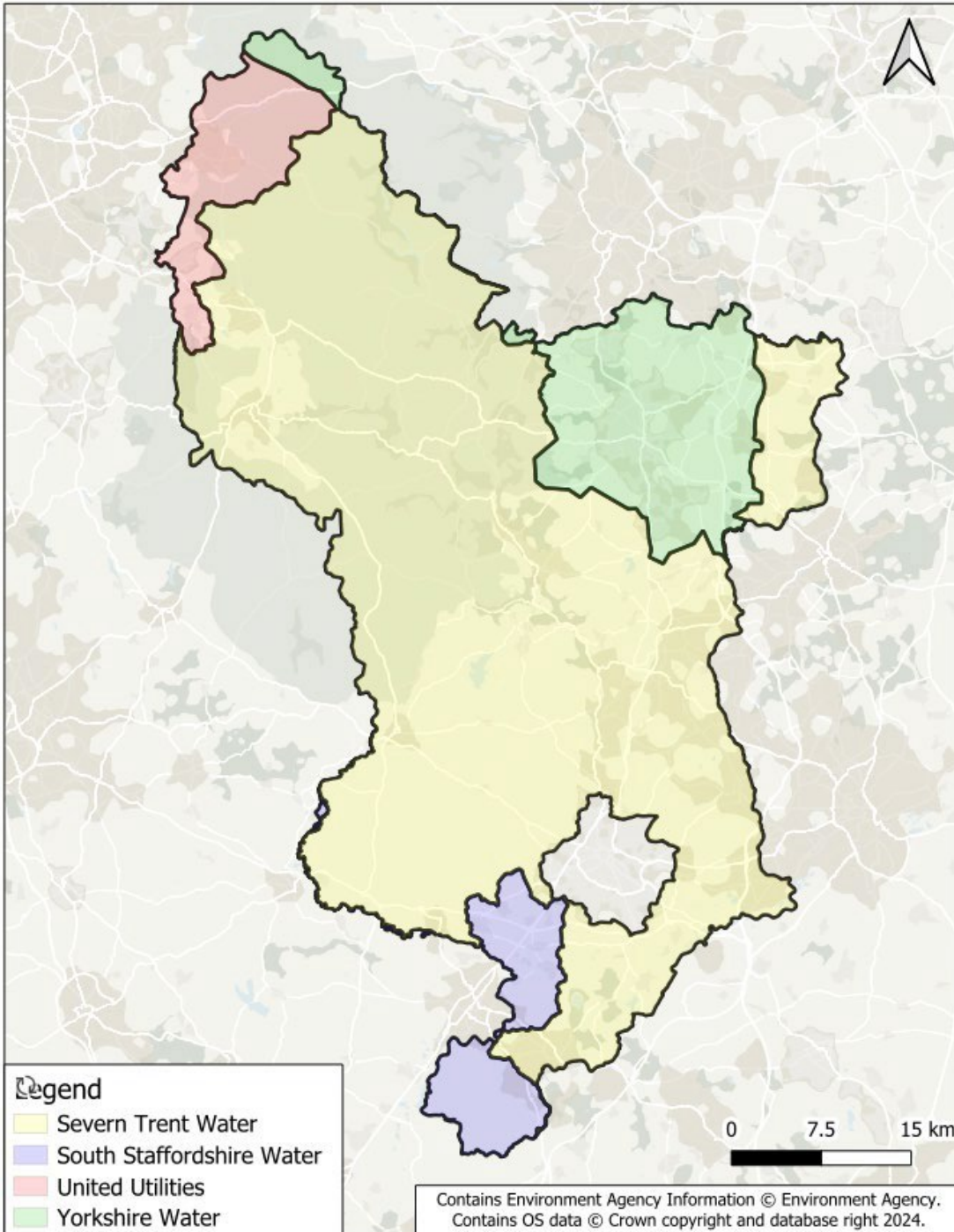


Figure 1-2: Water companies operating within the administrative area of Derbyshire County Council

1.5.5 National Highways

National Highways has sole responsibility and powers for managing highway surface water runoff from the trunk road network, such as the M1, A6, A38, A50 and A52. It shares the same flood risk management duties as a county council has as a highway authority.

1.6 Other Relevant Bodies or Groups

1.6.1 Canal and River Trust

The Canal & River Trust is not an RMA and does not have any flood risk management responsibilities or duties under the Flood and Water Management Act 2010. However, it can assist by offering support to an LLFA and other RMAs. In some cases, this may be by inspecting, maintaining and operating the water control structures it owns under the instruction of an RMA. However, its only duty is for its assets to meet its statutory obligation to maintain navigation.

1.6.2 Riparian Landowners and Residents

Riparian landowners are those who own land adjoining or containing a watercourse. They have certain rights and responsibilities, including responsibility for the maintenance of watercourses and assets within their ownership, and to ensure flood risk is not increased upstream or downstream of their land. Private drains are also the responsibility of the property or landowner to maintain.

Residents or business owners who are concerned that they may be at risk of flooding can take appropriate action to protect themselves and their property. These actions include registering to receive flood warnings and making the inside of their property more flood resilient. For example, by keeping more important possessions upstairs, raising electrical sockets, or by replacing downstairs fixtures and fittings with more flood resilient alternatives. Actions could also include installing external Property Flood Resilience measures, such as water-resistant doors, airbrick covers, floodgates and the fitting of non-return valves on pipes. The [National Flood Forum](https://nationalfloodforum.org.uk/about-flooding/reducing-your-risk/protecting-your-property/) provides guidance on protecting your property from flooding (<https://nationalfloodforum.org.uk/about-flooding/reducing-your-risk/protecting-your-property/>)

The Environment Agency's guidance on owning a watercourse (<https://www.gov.uk/guidance/owning-a-watercourse>) provides information on responsibilities, rules and required permissions for riparian landowners.