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Level 2 Strategic Flood Risk Assessment - HA16

Final

Prepared for
Derby City Council

Date
July 2026

Derby City Council

Contents

1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for Derby City Council. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the Derby City Level 1 SFRA and read the Derby City Level 2 SFRA and is therefore familiar with the terminology used in this report.

1.1 Site details

- Location: Land South of Bateman Street, Rose Hill
- Site area: 0.8ha.
- Existing site use: Greenfield
- Proposed site use: Housing/residential

1.2 Topography

Figure 1-1 shows the topography of the city centre represented by the Environment Agency (EA) 1m resolution LiDAR. This indicates that the topography of the site ranges between approximately 50.9mAOD in the northern area of the site to approximately 48.2mAOD along the eastern boundary of the site. The wider topography demonstrates that elevations are generally higher to the north and west of the site and gradually fall towards the east.

Figure 1-1: Topography of the site.

1.3 Geology and soils

Geology at the site consists of:

- Bedrock - The site is entirely underlain by Gunthorpe Member-Mudstone
- Superficial - Allenton Terrace Deposits consisting of sand and gravel within the northeastern corner of the site.

Soils at the site consist of:

- Freely draining slightly acidic loamy soils.

2 Sources of Flood Risk

2.1 Location of site within the catchment

The site is located within the urban extents of Derby and is within the catchment of the middle reach of the River Derwent. This drains approximately 1120km^2 at Derby and lies within the Derwent Derbyshire Management Catchment.

2.2 Existing drainage features

The site does not have any drainage features within or near its boundary, however as it is within the urban extents of Derby, any water is expected to drain into the surface water sewer network that ultimately drains into the River Derwent.

2.3 Fluvial

2.3.1 Available data

The EA's Flood Map for Planning (FMfP) has been used within this assessment. Due to the absence of detailed modelling at the site and reliance on national modelling, depths, velocities and hazards were not available for the assessment.

Table 2-1: Existing fluvial flood risk based on the EA FMfP data

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
72.2	27.8	0.0	0.0

**The percentage flood zones quoted show the percentage of the site at flood risk from that particular flood zone or event e.g. Flood Zone 1 is the remaining area outside Flood Zone 2 + Flood Zone 3 = 100%).*

2.3.2 Description of risk to the site

Fluvial flood risk is concentrated within low points at the northeast of the site and southern portion of the site. The areas at risk within the site are located within Flood Zone 2 (0.1% AEP event). Whilst Flood Zones generally represent the risk to sites from fluvial and tidal sources, in this instance the source of data is identified as direct rainfall modelling which may be more indicative of a surface water origin.

The source model was not available for this assessment. Given that the areas of risk broadly align with those identified in the risk of flooding from surface water dataset, please refer to Section 2.4 for a description of the areas of risk and available depth, velocity and hazard information.

It is recommended that developers should consult with the Environment Agency and or Lead Local Flood Authority as part of their site-specific flood risk assessment to understand the source of risk and available modelling, to design mitigation measures accordingly.

2.3.3 Climate Change

2.3.3.1 Available data

The EA's Flood Map for Planning (FMfP) plus climate change extents were used to assess climate change flood risk to the site. Due to the absence of detailed modelling at the site and risk only being covered by national modelling, depths, velocities and hazard were not available for the assessment.

Table 2-2: Comparison of fluvial flood risk to the site between the 1% AEP and 1% AEP plus 29% climate change extents.

Event	1% AEP	1% AEP plus 29% CC
Percentage of site at risk (%)	0.0	27.8

2.3.4 Description of risk to the site

Fluvial flood risk during the climate change event is concentrated within low points at the northeast of the site and southern portion of the site. As within the present-day event, the national modelling originates from a direct rainfall model which may be more indicative of surface water origin.

Given that the areas of risk broadly align with those identified in the risk of flooding from surface water dataset, please refer to the Section 2.4 for a description of the areas of risk and available depth information.

2.4 Surface water

2.4.1 Available data

The EA's Surface Water Spatial Planning Dataset, released in May 2026, has been used within this assessment to inform the extent and depth of surface water risk. Velocity and hazard data is not currently available within this dataset, therefore the Risk of Flooding from Surface Water (RoFSW) map has been used within this assessment to inform the velocity and hazard of surface water risk.

The flood risk information in the latest RoFSW dataset (September 2025) represents the low, medium or high likelihood of a flood depth occurring with water at a given depth/velocity/hazard or higher (e.g. the chance of flooding reaching a depth of 60cm or greater). The greater or equal to symbol (≥) has been used in Table 2-3 to show that the maximum flood depth, velocity and hazard category presented also includes values beyond the given threshold.

Table 2-3: Present day surface water flood risk based on the FMfP SW map and RoFSW.

Event	High risk (3.3% AEP)	Medium risk (1% AEP)	Low risk (0.1% AEP)
Percentage of site at risk* (%) - FMfP SW	6.6	2.7	15.1
Maximum depth (m) - FMfP SW	0.15-0.3	0.3-0.6	0.3-0.6
Maximum velocity (m/s) - RoFSW	<0.25	<0.25	≥0.25
Maximum hazard classification - RoFSW	≥0.5 (Caution)	≥0.75 (Danger for some)	≥0.75 (Danger for some)

** The percentage surface water extents quoted show the percentage of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP includes the 3.3% AEP percentage).*

2.4.2 Description of risk to the site

Surface water flood risk at the site is primarily concentrated along the eastern boundary, extending into the central portion of the site. No distinct surface water flow paths are present within the RoFSW mapping as the majority of surface water flooding pools within topographic low spots within the east of the site. Site-specific hydraulic modelling may be required at the Flood Risk Assessment stage to understand surface water flow paths and support the design of a SuDS scheme.

During the 3.3% AEP event, the maximum depths are between 0.15 and 0.3m in areas of topographic low spots within the northeast of the site. The maximum velocity of <0.25m also occurs within these topographic low spots, alongside the maximum hazard-to-people classification of ≥0.5 (Caution).

During the 1% AEP event, there is a small increase in the extent of flooding within the topographic low spots in the northeast of the site. The maximum depths within the site increase to 0.3 - 0.6m within a topographic low spot along the eastern boundary of the site. The maximum velocity within the site remains at <0.25 during the 1% AEP event, with a small increase in the extent of this maximum velocity within the topographic low spots in the northeast of the site. The maximum hazard-to-people classification within the site increases to ≥0.75 (Danger for some), following a similar pattern of risk as the depth in the topographic low spot along the eastern boundary.

During the 0.1% AEP event, there is a greater increase in the extent of flooding within the northwest corner and southeast of the site. The maximum flood depths remain at 0.3 - 0.6m, with a small increase in the area of maximum flood depths within the topographic low spots in the northeast of the site. There is an increase in maximum velocities within the site during the 0.1% AEP event to ≥0.25 within a topographic low spot in the southeast of the site. The maximum hazard-to-people classification remains at ≥0.75 (Danger for some),

however, there is an increase in the extent of this hazard within a topographic low spot in the northeast of the site.

2.4.3 Climate Change

2.4.4 Available data

The EA's Surface Water Spatial Planning Dataset, released in May 2026, has been used within this assessment to inform the extent and depth of surface water risk with climate change. Climate change outputs are available for the 3.3%, 1%, and 0.1% AEP events with the Upper End climate change allowance for the 2070s epoch. There is currently no available velocity or hazard information to use within this assessment.

Table 2-4: Comparison of surface water flood risk to the site between the 1% AEP and 1% AEP plus 40% climate change extents.

Event	1% AEP	1% AEP plus 40% CC
Percentage of site at risk (%)	2.7	15.1
Maximum depth (m)	0.3-0.6	0.3-0.6

2.4.5 Description of risk to the site

The comparison of surface water flood risk to the site in Table 2-4 shows an increase in flood extents from 2.7% to 15.1% during the 1% AEP and 1% AEP plus climate change (40%) events. The areas of increased flood risk are predominantly located along the eastern boundary, extending westwards into the central portion of the site. A small increase in flood extents can also be seen within the northwest corner of the site.

The maximum flood depths within the site have remained at 0.3 to 0.6m during the 1% AEP plus climate change (40%) event. However, during the 1% AEP plus climate change (40%) event, there is an increase in the extent of depths ranging between 0.3 to 0.6m along the eastern boundary. Across the remainder of the site, there is an increase in the extent of flood depths ranging between 0.15 to 0.3m along the eastern boundary and towards the central portion of the site. Within the northeastern corner of the site, there is also an increase in extents with a depth of less than 0.15m.

2.5 Reservoir

The site is not shown to be at risk from reservoir flooding during either the Dry Day or Wet day scenarios from the EA Reservoir Flood Maps.

2.6 Groundwater

The JBA Groundwater Emergence Mapping shows that there is a small pocket of ground water levels that lie within 0.025m and between 0.025m and 0.5m of the ground surface in the north-eastern area of the site. For the remainder of the site, there is little risk of ground water emergence.

Where groundwater levels are indicated to be at or very near (within 0.025m) ground level there is a risk of groundwater flooding at the surface during a 1% AEP event, which may flow to and pool within topographic low spots. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity.

Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate in these areas.

This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.

2.7 Sewers

The sewer flooding risk register provided by Derby City Council shows that there have been no instances of sewer flooding within the postcode area of the site.

2.8 Flood history

The EA's Historic Flood Mapping and Recorded Flood Outlines datasets do not show records of any flooding on or surrounding the site.

3 Flood risk management infrastructure

3.1 Defences

The EA AIMS dataset shows that the site is not protected by any formal flood defences.

3.2 Residual risk

The site may be at residual risk of flooding resulting from the breach or overtopping of flood defence structures associated with the River Derwent. However, given that the site is located approximately 850m from the river and occupies relatively higher ground, the likelihood of flooding from such an event is considered to be low.

4 Emergency planning

4.1 Flood warnings and alerts

The site is not located in an EA Flood Warning or Flood Alert Area.

4.2 Access and escape

Safe access and escape will need to be demonstrated in the 1% AEP plus climate change fluvial and surface water events. Site drainage proposals should address the requirements for access routes, avoid impeding surface water flows and preserve the storage of surface water to avoid exacerbation of flood risk elsewhere on the site and in the wider catchment.

4.2.1 Potential access

The site can currently be accessed by Bateman Street at the northern boundary of the site. Bateman Street provides access to Osmaston Road (A514) which runs to the west of the site and London Road (A5194) which runs to the east of the site.

4.2.2 Fluvial

Whilst Flood Zones generally represent the risk to sites from fluvial and tidal sources, in this instance the source of data is identified as direct rainfall modelling which may be more indicative of a surface water origin. There is negligible risk to accessing the site from Bateman Street along the northern boundary of the site. However, access within the site may be restricted along the eastern boundary indicated by Flood Zone 2 extents (0.1% AEP).

It is recommended that developers should consult with the Environment Agency and or Lead Local Flood Authority as part of their site-specific flood risk assessment to understand the source of risk and available modelling, to put in place appropriate access and escape measures.

4.2.3 Surface water

Surface water flooding is considered to be the primary risk to the site. During the 1.0% AEP plus climate change event, access is maintained from Bateman Street along the northern boundary of the site. Access and escape is only impeded within and along the eastern boundary of the site. Depths which may impede access to the site are between 0.3 to 0.6m during the 1.0% AEP plus climate change event.

4.3 Dry islands

The site is not located on a dry island.

5 Requirements for drainage control and impact mitigation

5.1 Broadscale assessment of possible SuDS

- BGS data indicates that the underlying geology is mudstone which is likely to be highly variable in permeability. This should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site.
- Within an area of lower elevation in the northeast corner of the site, groundwater levels are indicated to be at or very near (within 0.025m) ground level and there is a risk of groundwater flooding at the surface during a 1% AEP event, which may pool within the topographic low spots. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate in this area.
- Across the remainder of the site groundwater flood risk is negligible, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work.
- The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.
- The site is not located within a historic landfill site.
- Where possible, proposed attenuation features such as basins, ponds and tanks should be located outside of Flood Zone 2 to avoid the potential risks to the hydraulic capacity or structural integrity of these features. Surface water outfalls that discharge into the River Derwent may be susceptible to surcharging due to water levels in the river. The impacts of flood flows will need to be considered in terms of the attenuation storage requirements of the site and placement of the outfalls.
- Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques.

5.2 Opportunities for wider sustainability benefits and integrated flood risk management

- Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (Local Planning Authority, Lead Local Flood Authority, and the EA) at an early stage to understand possible constraints.
- Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.
- Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered.
- Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. At the site, the receiving waterbody is likely to be the River Derwent which has a moderate ecological status. The use of multistage SuDS treatment will improve water quality of surface water runoff discharged from the site and reduce the impact on the receiving water bodies.
- Due to the urban nature of the area adjacent to the site, opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site.

6 NPPF and planning implications

6.1 Exception Test requirements

The Local Planning Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied.

The NPPF classifies residential development as More Vulnerable.

The Exception Test is not required for this site because More Vulnerable development is proposed at a site located in Flood Zone 1 and Flood Zone 2.

6.2 Requirements and guidance for site-specific Flood Risk Assessment

At the planning application stage, a site-specific FRA will be required as the proposed development site:

- Is in Flood Zone 2
- Is within 'Flood Zones plus Climate Change', showing it is at increased risk of flooding from rivers or sea in the future
- Is within Flood Zone 1 and the Flood Map for Planning shows it is at risk of flooding from surface water, now or in the future
- Is within Flood Zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime

All sources of flooding should be considered as part of a site-specific FRA.

Consultation with Derby City Council as LPA and LLFA, Severn Trent, and the EA should be undertaken at an early stage.

Any FRA should be carried out in line with latest guidance including the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change Planning Practice Guidance (PPG), and Derby City Council Local Plan Policies.

The development should be designed with mitigation measures in place where required.

6.3 Guidance for site design and making development safe

The site layout should adopt a sequential approach by steering development away from areas of higher risk of fluvial and surface water flooding in topographic low spots within the northern east and southern portions of the site.

Whilst the site is located in Flood Zone 2, the source of this data appears to be direct rainfall modelling, which may indicate a surface water origin. Additional investigation and consultation with the EA/LLFA should be carried out to understand the origins flooding on the site.

The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not

increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are as close as possible to pre-development greenfield rates, with areas of surface water ponding used as open space and SuDS or water compatible/essential infrastructure uses only.

Arrangements for safe access and escape will need to be provided for the 1% AEP fluvial and surface events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate measures, so development and occupants are safe.

Provisions for safe access and escape should not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.

7 Conclusions

This Level 2 site assessment has been developed for Site HA16 for proposed housing/residential use. The NPPF classifies residential development as 'More Vulnerable'.

The following points should be considered in development of this site:

- The Exception Test is not required for this site because More Vulnerable development is proposed at the site located in Flood Zone 1 and Flood Zone 2.
- However, the LPA should follow a similar principle as the proposed site is at risk from surface water flooding.
- A small extent of the site is located within Flood Zone 2, with the remainder of the site located in Flood Zone 1 as defined by the Environment Agency's Flood Map for Planning. The data used to derive the national modelling at the site is taken from a direct rainfall model.
- The site layout should adopt a sequential approach by steering the most vulnerable aspects of the development outside of areas at risk of fluvial and surface water flooding within the northeast and southern portions of the site.
- Further site investigation is recommended to contextualise the origins of the risk of flooding to the site which can likely be managed through the implementation of a site drainage strategy.
- The site will require a site-specific Flood Risk Assessment that quantifies the flood risk at the site from all sources in the present day while also taking into account increases due to climate change.
- Developers should consult with a range of stakeholders at an early stage to understand the impacts of the site on the surrounding area and infrastructure including the LA, LLFA, EA, Canal and River Trust along with Severn Trent Water.

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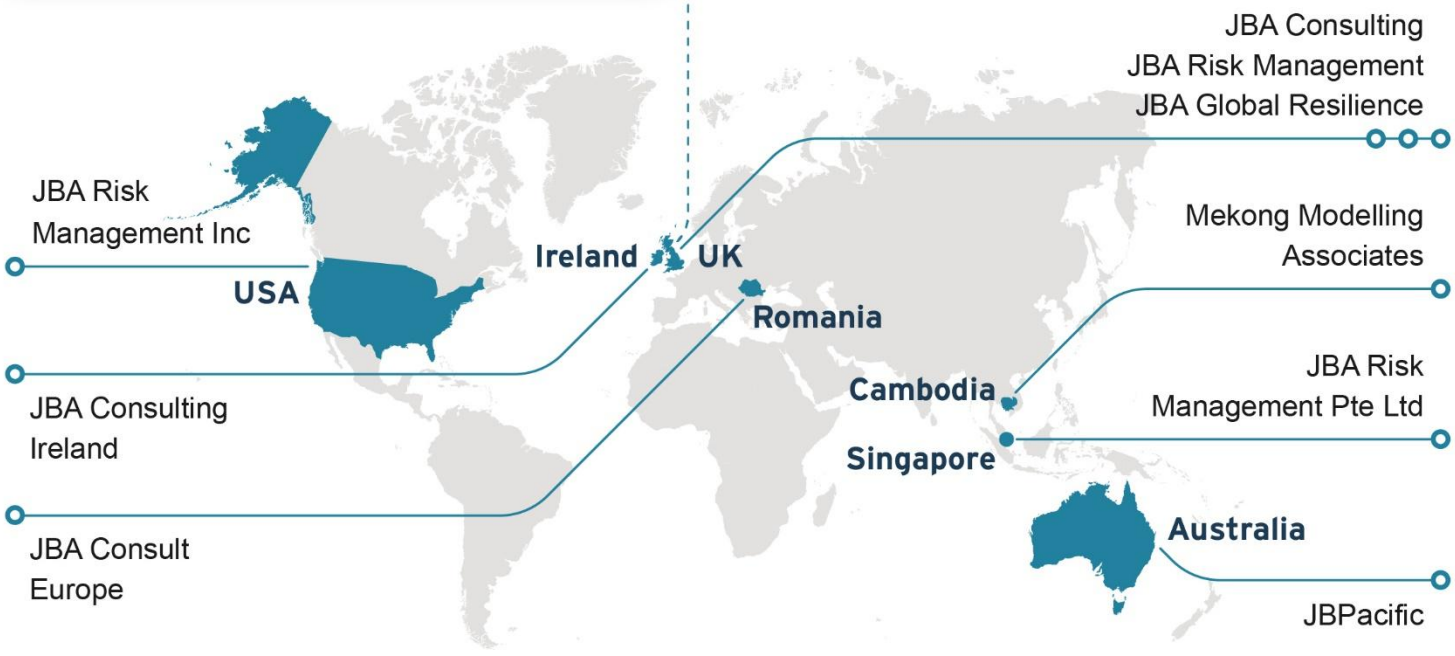

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