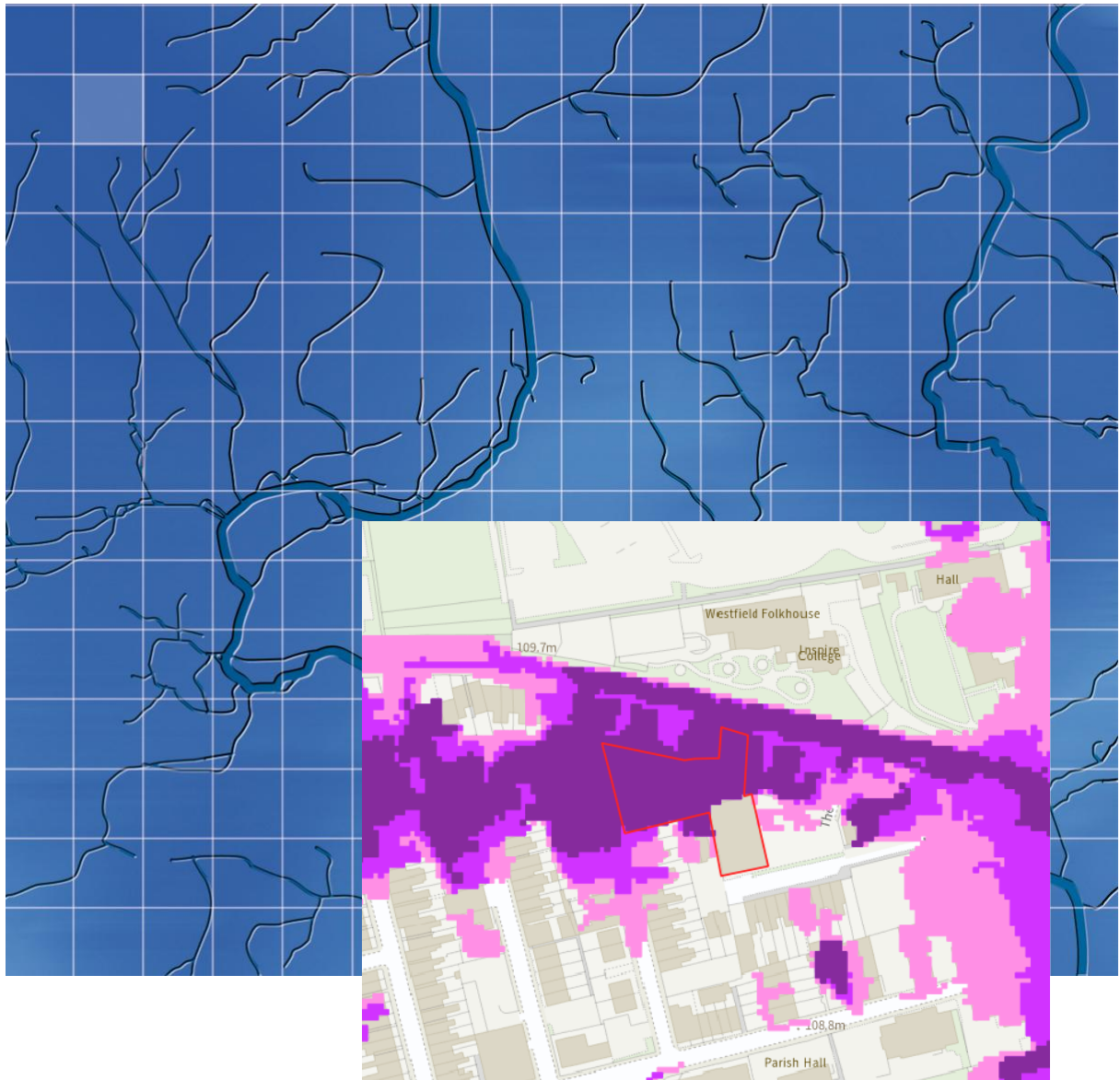


Mansfield District Council

September 2026

Appendix 1 Land at Lindley Street Level 2 Strategic Flood Risk Assessment



Mansfield District Council

Land at Lindley Street

Level 2 Strategic Flood Risk Assessment

Document issue details

WHS10323

Version	Issue date	Issue status	Prepared By	Approved By
1.3	04/09/2026	Final	Jasmine Lucas (Consultant)	Daniel Hamilton (Principal Consultant)

For and on behalf of Wallingford HydroSolutions Ltd.

This report has been prepared by WHS with all reasonable skill, care and diligence within the terms of the Contract with the client and taking account of both the resources allocated to it by agreement with the client and the data that was available to us. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of any nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.



The WHS Quality & Environmental Management system is certified as meeting the requirements of ISO 9001:2015 and ISO 14001:2015 providing environmental consultancy (including monitoring and surveying), the development of hydrological software and associated training.



Registered Office Stables 4, Howbery Business Park, Wallingford, OX10 8BA
www.hydrosolutions.co.uk

Land South of Clipstone Rd East Level 2 SFRA

Flood Risk Overview

Fluvial Flood Risk	L
Pluvial Flood Risk	H
Other Sources of Flood Risk	L
Confidence in Assessment	M

Flood Risk

Pluvial flood risk represents the greatest risk of flooding to the site with 72% of the site inundated during a 1.0% AEP +CC event. This flood risk is concentrated in the north of the site. The Flood Map for Planning Surface Water Spatial Planning depth data shows depths are between 300 and 600 mm. It should be noted that an existing industrial/commercial building in the south of the site currently forms a significant barrier to flood water.

The risk of fluvial flooding is considered to be low as the entire site is located in Flood Zone 1.

The risk from other sources of flooding is considered to be low.

The overall confidence in the assessment is moderate. This is based on the fact that the EA's latest national scale modelling has informed the assessment of surface water flood risk. Infrastructure will likely need to be located in the current surface water flood zones, therefore bespoke modelling will likely be needed at the planning stage.

Conclusions and Recommendations

The development proposed is residential and categorised as *More Vulnerable Development*. It should be possible to locate all infrastructure in Flood Zone 1 at this site to avoid fluvial flood risk to people and property.

However, it is unlikely that all properties could be located outside of the surface water design event extent. Furthermore, the existing mapping includes the impact of existing buildings onsite which may be demolished to make space for the new development. In this regard, it is recommended that site-specific pluvial modelling is carried out to inform design flood levels and finished floor levels for the proposed site.

Contents

1	Introduction	2
1.1	Background	2
1.2	Assessment of Flood Risk	2
1.3	Report Structure	3
2	Site Description	4
2.1	General Location Plan	4
2.2	Topography	4
2.3	Nearby Watercourses	4
3	Flood Risk	6
3.1	Historical Flooding	6
3.2	Fluvial Flood Risk	6
3.3	Flood Defence Infrastructure	6
3.4	Surface Water Flood Risk	6
3.5	Groundwater Flooding	6
3.6	Reservoir Flood Risk	6
3.7	Flood Warning Service	6
4	Detailed Review of Primary Flood Risk	10
4.1	Primary Flood Risk	10
4.2	Flood Risk Metrics	10
4.3	Access and Egress	10
5	Development Viability and FRA recommendations	12
5.1	Development Categorisation	12
5.2	Scale of Development	12
5.3	Sequential Approach	12
5.4	Other Site-Specific Considerations	12

1 Introduction

1.1 Background

Wallingford HydroSolutions Ltd has been commissioned by Mansfield District Council (MDC) to undertake a Level 2 Strategic Flood Risk Assessment (SFRA) at Land Lindley Street, in accordance with the National Planning Policy Framework (NPPF)¹, Planning Practice Guidance (PPG)² and associated guidance from the Environment Agency (EA)³.

Where there is a risk of flooding at the site, this risk has been quantified with the latest available datasets and any associated limitations with the assessment have been identified.

Where applicable, recommendations for improving our understanding of flood risk and/or mitigating the risk has also been included in this report.

1.2 Assessment of Flood Risk

For the site, a detailed assessment of the nature of flood hazard was undertaken. This included using the relevant fluvial modelling data to assess:

- The proportion of the site inundated for a range of return periods
- The speed of onset
- Flood depth
- Flood velocity
- Flood Hazard

The site is assessed against a range of return periods, however the design event, the 100-year (plus central climate change) event, was considered most important for planning purposes.

In addition to the analysis of modelling data, the location, standard and condition of existing flood defences was assessed. Other sources of flooding were also reviewed at the site. This included an assessment of surface water flooding and an assessment of groundwater flooding based on available hydrogeological information from BGS and SoilScapes. Potential access/egress routes were identified with respect to the risk posed from all sources of flooding.

Following a review of flood risk, flood defences and access/egress routes, an assessment was made on whether a future site-specific FRA would be able to show that the site can be allocated for development. The assessment takes into account the flood risk vulnerability of the development, the scale of development proposed along with any requirements for the Exception Test. In this context, any mitigative actions in the form of ground raising and compensatory storage are identified.

The site assessment also includes guidance for the preparation of FRAs, including information about the use of SuDS.

¹ Ministry of Housing Communities & Local government (2024) National Planning Policy Framework https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

² UK Government (2025) Planning practice guidance- Flood risk and coastal change <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

³ Environment Agency (2026) <https://www.gov.uk/guidance/how-to-prepare-a-strategic-flood-risk-assessment>

1.3 Report Structure

This FRA follows the structure summarised below:

- 1 - Introduction (this section)
- 2 - Site Description
- 3 - Flood Risk
- 4 - Detailed Review of Primary Flood Risk
- 5 - Development Viability and FRA Recommendations

2 Site Description

2.1 General Location Plan

Land at Lindley Street is a 0.18 ha site located northwest of Mansfield town centre, see Figure 1. The site is brownfield, being occupied by a vacant industrial/commercial buildings. Land use surrounding the site is residential.

The site is a proposed allocation for residential development in the emerging Local Plan review, with a capacity of 8 dwellings.

2.2 Topography

Based on 1m LiDAR data the site slopes from west to east, with ground levels ranging from 107.3 m AOD to 109.5 m AOD, see Figure 2. The average ground level is 108.4 m AOD.

2.3 Nearby Watercourses

The closest watercourse to the site is the River Maun which flows from south to north through Mansfield town centre approximately 770 m east of the site, see Figure 1.

Land at Lindley Street Level 2 SFRA

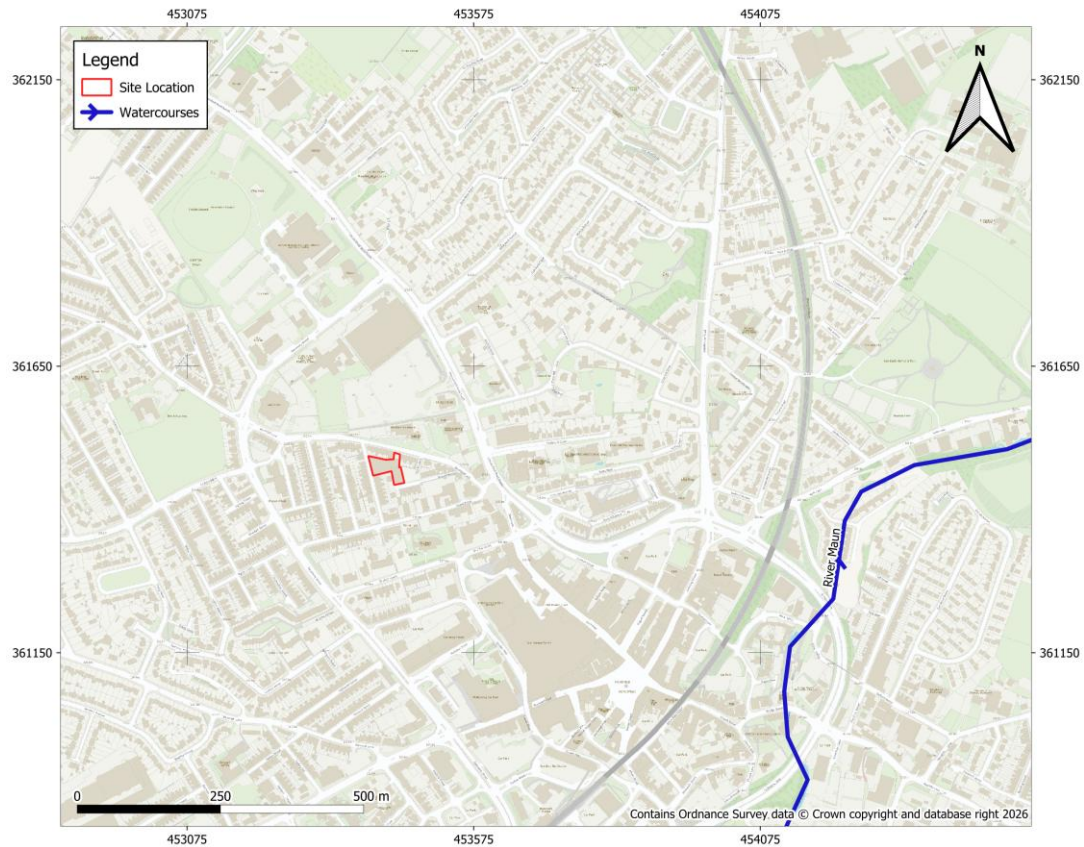


Figure 1 - Site Location

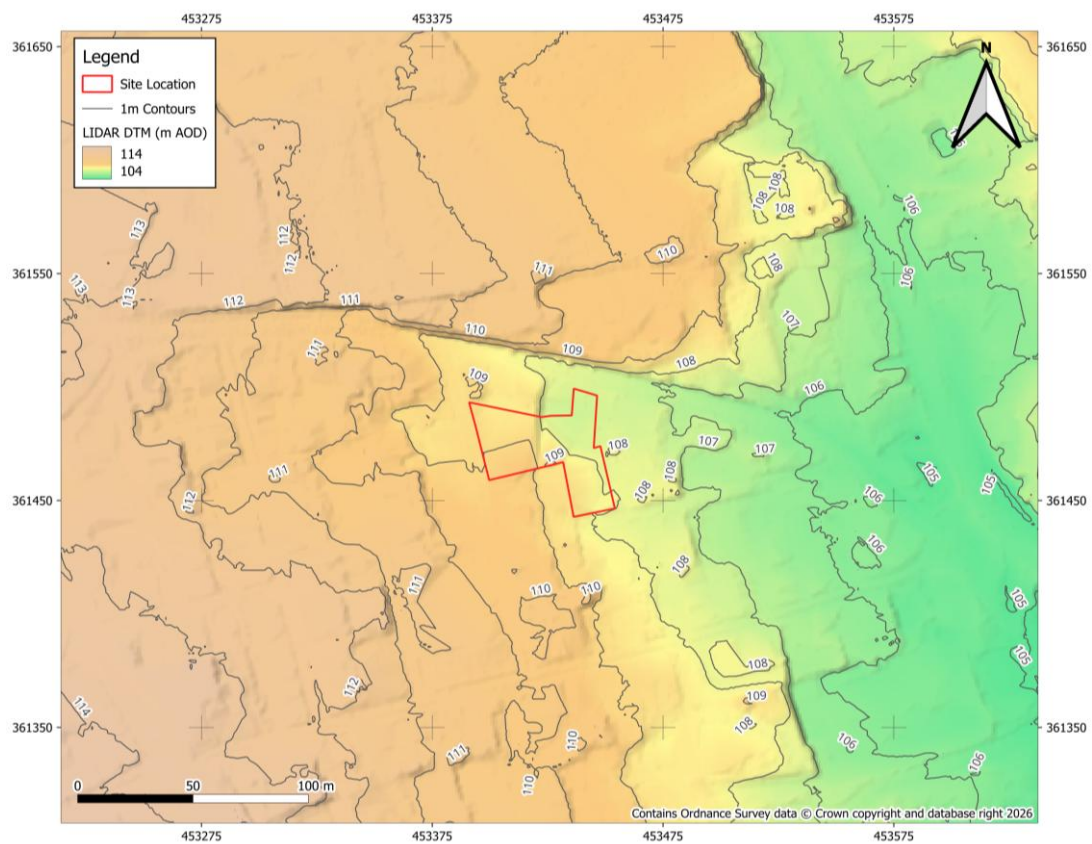


Figure 2 – Topography

3 Flood Risk

3.1 Historical Flooding

The EA hold no records of historic flooding at the site.

3.2 Fluvial Flood Risk

In the EA Flood Map for Planning (FMfP), the entire site is located within Flood Zone 1, defined as land having a less than 0.1% annual chance of flooding, see Figure 3.

When considering an allowance for climate change, no changes are shown in the extent of inundation within the site, Figure 4.

Fluvial flood risk is considered to be low and no further assessment is required.

3.3 Flood Defence Infrastructure

Flood defences are present along the River Maun through Mansfield town centre, however ground levels at the site are already located at least 10 m higher than the river channel so these do not serve the site. The site is not located within or near a flood storage area.

3.4 Surface Water Flood Risk

The EA's surface water flood maps show 71% of the site is inundated in the 3.3% Annual Exceedance Probability (AEP) event, 72% is inundated in the 1.0% AEP event and 72% is inundated in the 0.1% AEP event, see Figure 5. When accounting for climate change the proportions slightly increase to 72% in the 3.3% AEP event, 72% in the 1.0% AEP event, and 73% in the 0.1% AEP, see Figure 6.

The surface water flood map shows the northern buildings and the hardstanding parking area within the site to be inundated. However, flood levels do not exceed the finished floor level of the building located in the south of the site. Therefore, the minimal change in the surface water flood extent as event magnitude increases is considered likely to be due to this building acting as a barrier to the flow of surface water.

Overall, the risk of surface water flooding is considered to be high and is assessed in more detail in Section 4.

3.5 Groundwater Flooding

Based on BGS mapping the site is underlain by Edlington formation which comprises mudstone and sandstone, which are expected to yield limited groundwater. No superficial deposits are present. Soils at the site are described as freely draining lime-rich and loamy, however currently the site is entirely brownfield and tarmacked.

Based on the data available the risk of groundwater flooding is considered low, however if the soil is exposed there may be potential for a mobile water table which could present a risk. A geotechnical assessment is recommended at the planning stage to confirm the level of risk from groundwater flooding.

3.6 Reservoir Flood Risk

The FMfP shows no part of the site to be at risk from reservoir flooding during either the wet or dry day scenario, see Figure 7.

3.7 Flood Warning Service

The site is not located within an EA Flood Warning Area.

Land at Lindley Street Level 2 SFRA

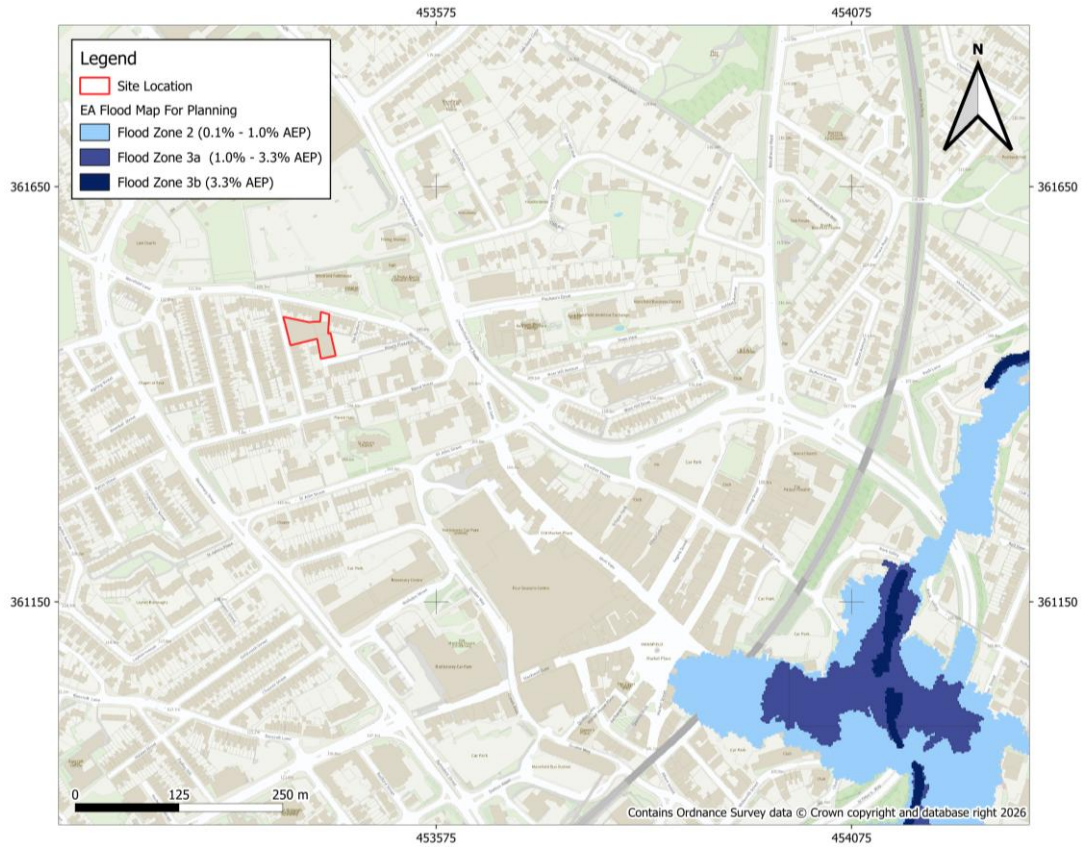


Figure 3 - Fluvial Flood Map

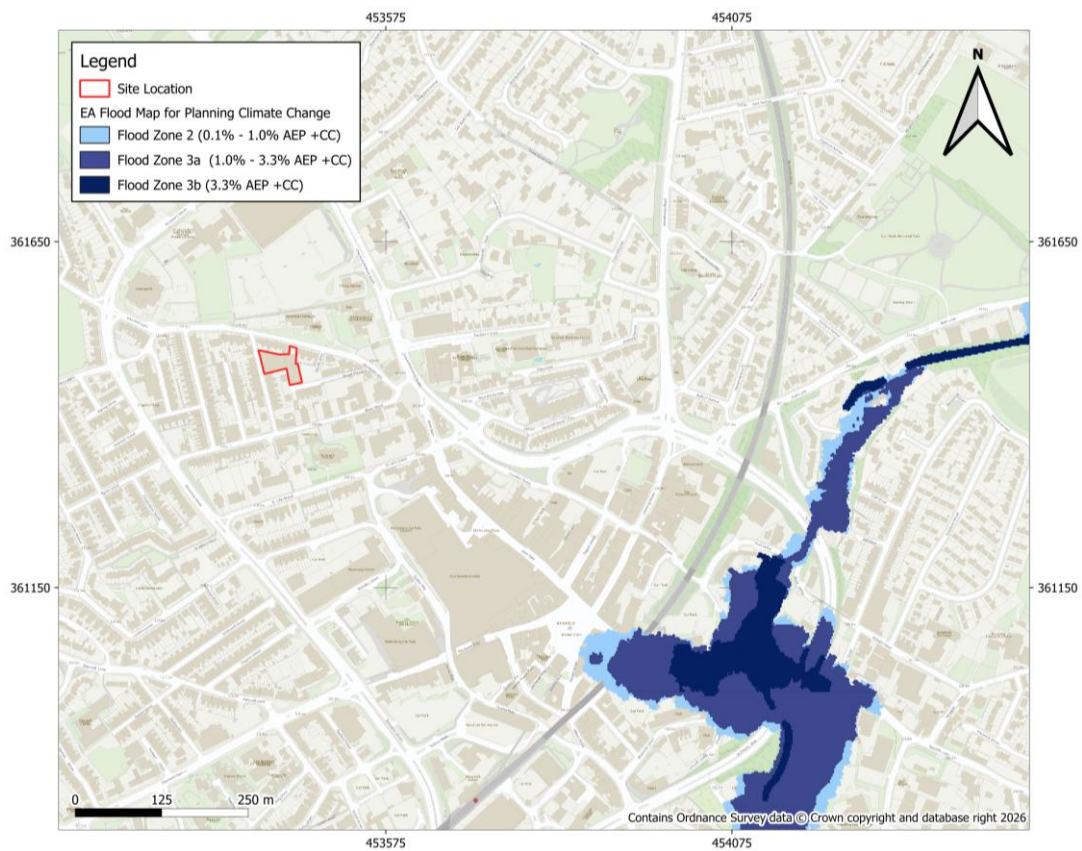


Figure 4 - Fluvial Climate Change Flood Map

Land at Lindley Street Level 2 SFRA

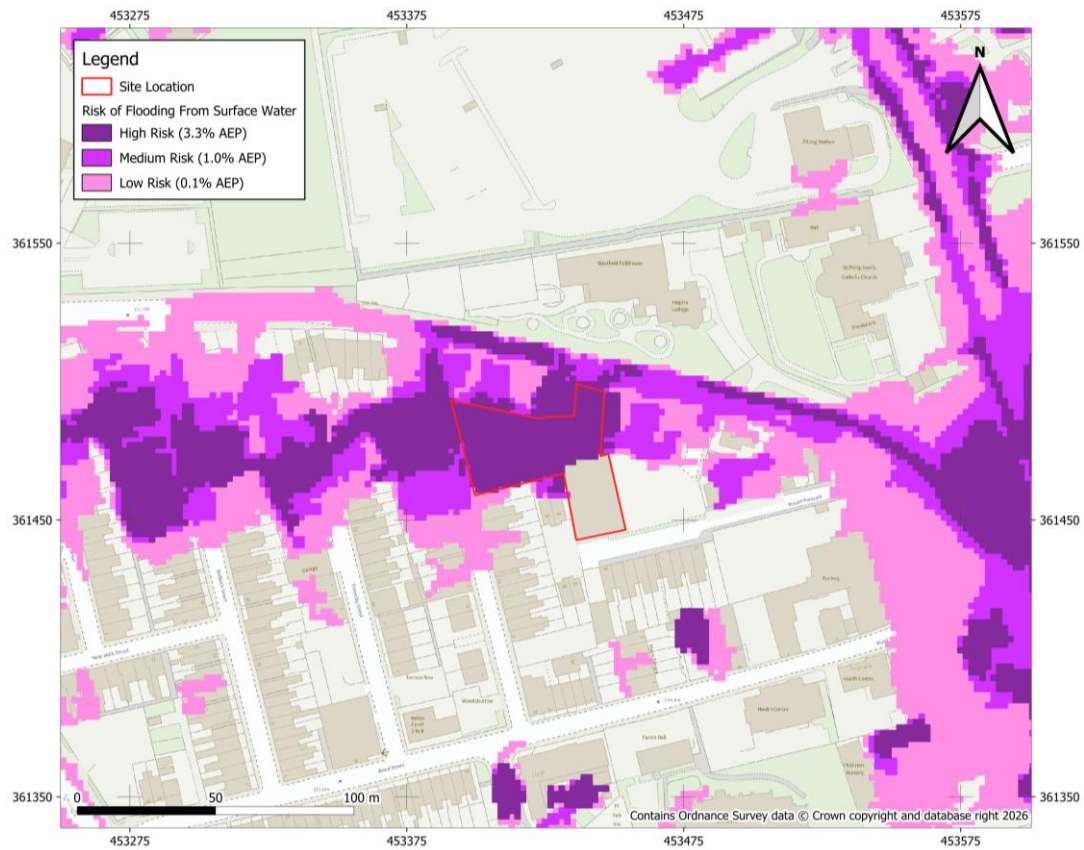


Figure 5 – Surface Water Flood Map

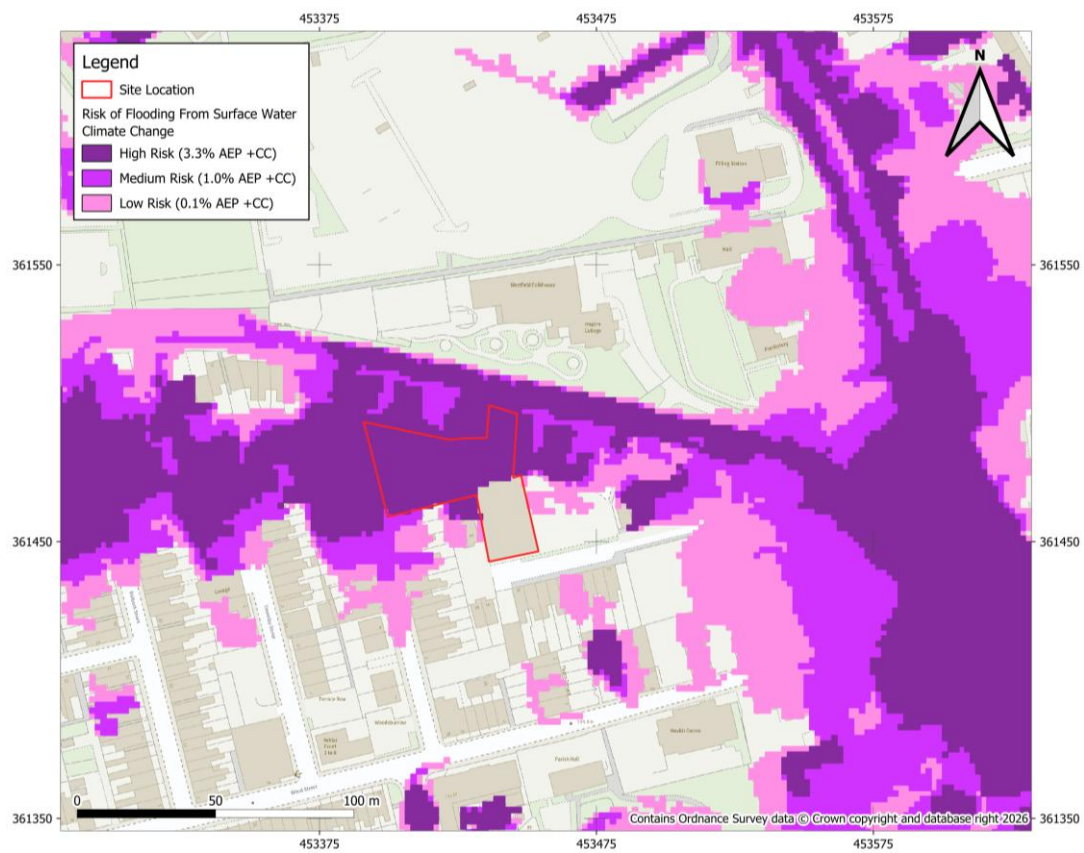


Figure 6 - Surface Water Climate Change Flood Map

Land at Lindley Street Level 2 SFRA

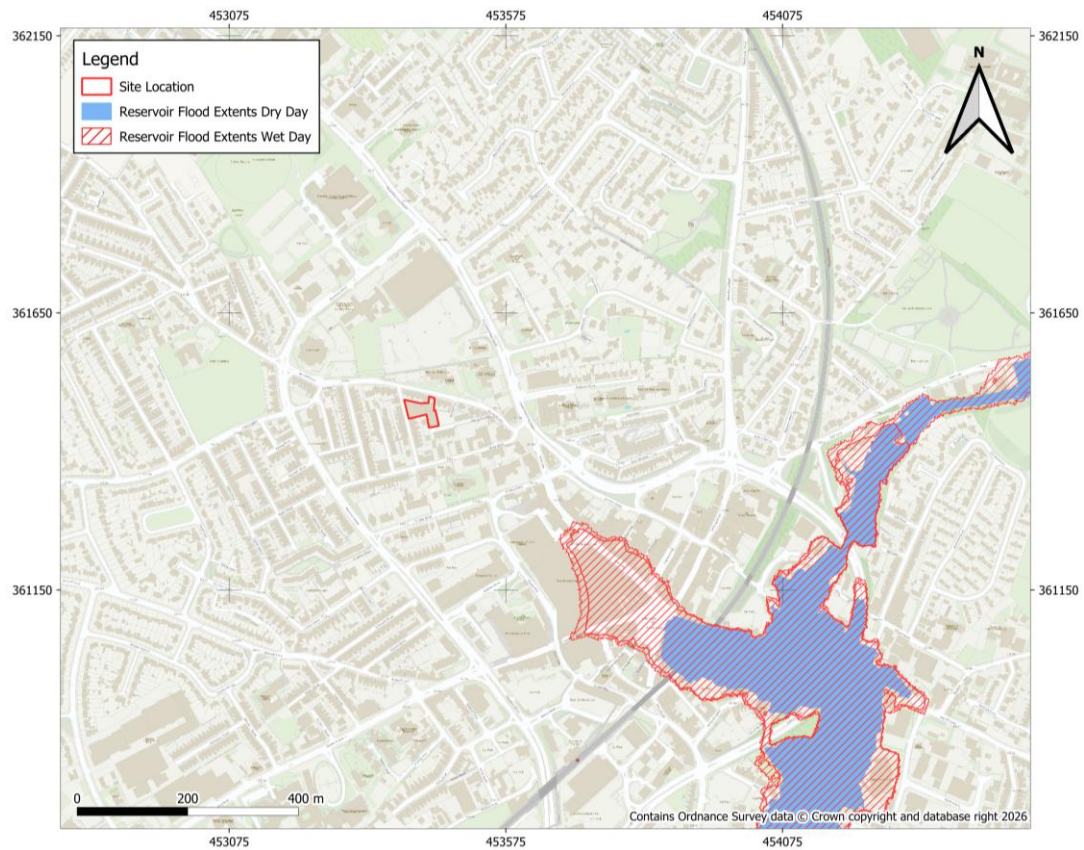


Figure 7 - Reservoir Failure Flood Map

4 Detailed Review of Primary Flood Risk

4.1 Primary Flood Risk

Pluvial flooding is the primary flood risk mechanism at the site and is assessed in more detail below.

4.2 Flood Risk Metrics

The FMfP Surface Water Spatial Extents depth data for the design 100-yr plus climate change (2070s epoch) design event was assessed to attain further detail on surface water flooding. During this event, the inundation is located in the north of the site with 72% of the site area inundated, see Figure 8.

Flood depths across the north of the site are consistently 300-600 mm. As the site slopes gradually from west to east, the associated velocities are expected to be low to moderate. The risk of surface water flooding is associated with a wider surface water flow route which flows between Ladybrook Lane to the west of the site and Chesterfield Road South to the east of the site.

As floodwater enters the site it inundates the buildings within the north of the site but does not inundate the finished floor level of the building to the south. Note, in most cases building footprints in the EA's surface water flood map are raised by 300mm, therefore flood depths need to reach this level in order to inundate them. In this case, it is thought that flood depths do not reach this depth along the border of the existing industrial/commercial building in the south of the site leading it to form a barrier to flood water.

It should be noted that the existing buildings are expected to be demolished prior to development, and such bespoke pluvial modelling will be required to produce an up-to-date assessment of surface water flood risk to the site.

4.3 Access and Egress

Access to the site is available via Lindley Street to the west or Westfield Lane to the north. Both access points lie within the modelled surface water flood extent. However, during an extreme pluvial event (0.1% AEP + CC), the safest egress route is via Lindley Street, travelling south, as shown in Figure 9. The greatest flood hazard along this route occurs at the junction of Belvedere Street and Stockwell Gate, where ponding depths of 300–600 mm are predicted. Nevertheless, following the route shown in Figure 9 avoids the deeper floodwater present within Mansfield town centre.

A site-specific FRA should assess the provisions for safe access and egress at the site in more detail once the final site layout and access points are known. It should assess nature of the flood risk to determine how quickly it occurs and the degree of hazard.

Land at Lindley Street Level 2 SFRA

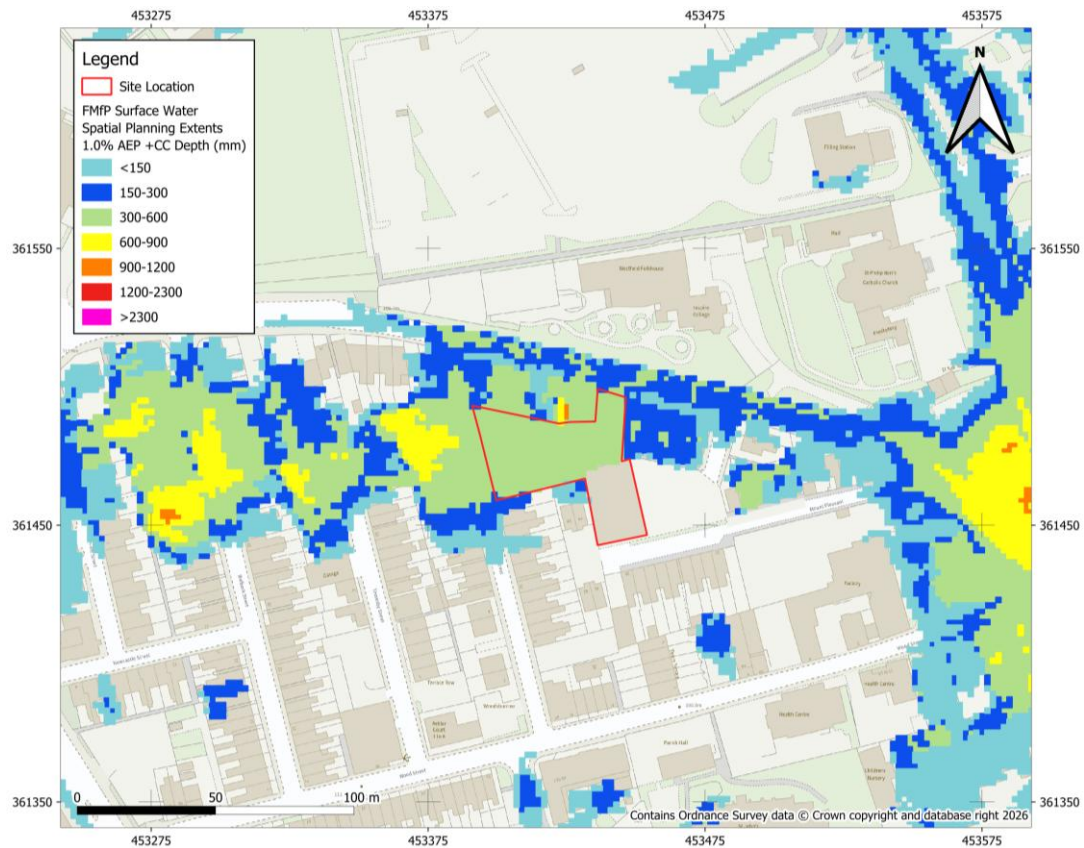


Figure 8 - FMfP Surface Water Spatial Extents - 1.0% AEP + CC Depth

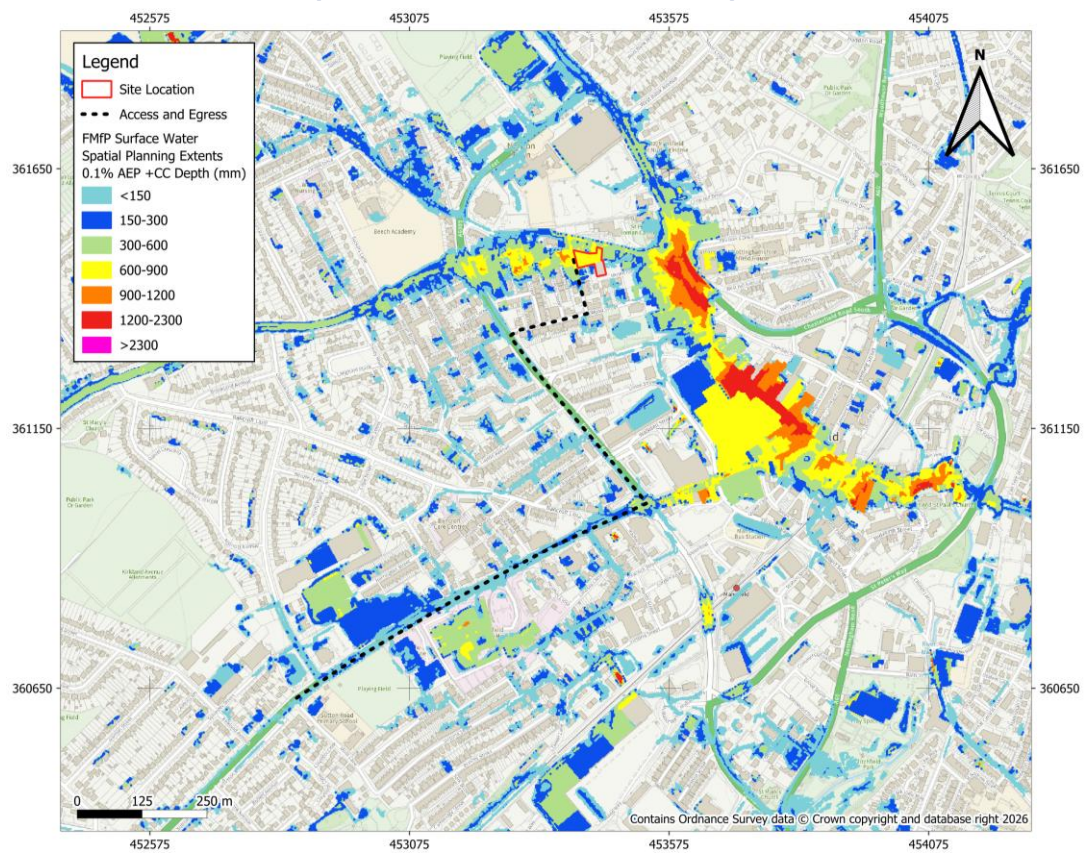


Figure 9 - Access and Egress Routes

5 Development Viability and FRA recommendations

5.1 Development Categorisation

The development proposed is residential and categorised as *More Vulnerable Development*. It should be possible to locate all infrastructure in Flood Zone 1 at this site to avoid fluvial flood risk to people and property.

It should be noted that whilst the site is at low fluvial flood risk, much of the site is at flood risk based on the EA's surface water modelling extents. The risk is concentrated in the north of the site and affects available access routes to and from the site. Given the extent of surface water flood risk, it is unlikely that all properties could be located outside of the flood risk zone. Furthermore, the existing mapping includes the impact of existing buildings onsite which may be demolished to make space for the new development. In this regard, it is recommended that site-specific pluvial modelling is carried out to inform design flood levels, the development layout and finished floor levels for the proposed dwellings.

5.2 Scale of Development

The total site area is 0.18 ha, allocated for 8 dwellings. Assuming the density of housing will be similar to the existing development in the area (60 dwellings per hectare) 8 dwellings would require 0.10 ha of land.

As the entire site is located within Flood Zone 1, development should be guided by the surface water flood risk at the site. The 1.0% AEP +CC design event inundates 72% of the site which indicates that 0.05 ha remains flood free during the design event. It is also assumed that as part of the development the existing buildings onsite will be demolished, which may increase the extent to which flood water transverses through the site.

In general, it is considered unlikely that all dwellings can be located outside of the surface water flood extent.

5.3 Sequential Approach

It is important that a sequential approach is implemented at the site, as the entire site is located within Flood Zone 1, surface water flood risk should be assessed to ensure development is prioritised in flood free areas where possible, followed by low risk, medium risk and high-risk areas.

The current surface water flood maps account for the influence of existing buildings on surface water flow routes. If the existing buildings are proposed to be demolished, site-specific pluvial modelling should be undertaken to reassess surface water flood risk following their removal. The results of this modelling should then be used to inform the sequential approach to the siting and layout of development.

Where appropriate, ancillary infrastructure such as car parks and green spaces could be located within areas of higher surface water flood risk to allow residential properties to be located within areas of lower flood risk. Given the size of the site and the likely density of development, it is considered unlikely that significant areas of green space will be available, although some small areas of garden or amenity space may be provided. Any development or infrastructure located within areas at risk of flooding should be appropriately designed to be resistant and resilient to flooding and must not increase flood risk elsewhere.

5.4 Other Site-Specific Considerations

Whilst this SFRA report has reviewed surface water flood risk, a site-specific FRA should consider in more detail how quickly it occurs, the degree of hazard to the site, and its impact on access considering the final layout. Given the extent of surface water flooding on site, bespoke pluvial modelling is recommended to better define flood depths and extents,

particularly following the removal of the existing building. The modelling should incorporate a detailed topographic survey and be used to inform the site layout, finished floor levels (above design flood level with appropriate freeboard) and access arrangements. The overall objective should be to demonstrate that the second part of the exception test can be passed, ensuring the development remains safe throughout its lifetime without increasing flood risk elsewhere.

A site specific FRA will also need to demonstrate that the site offers sustainability benefits that outweigh flood risk to satisfy the first part of the exception test. At this stage, the expected sustainability benefits of the site are focused on regeneration. The former bus depot buildings are in a poor state and require demolition. The site has been subject to fly tipping and anti social behaviour. Redevelopment of the site would resolve these issues and deliver new homes to meet the council's identified housing need, all be it a small number, within a sustainable location. The alternative the site is left in a poor state and the above issues continue.

The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that surface water flood risk at the site and to third party land is not increased. In assessing and demonstrating the viability of any drainage solution for the site, a site-specific FRA should follow the national standards for SuDS and any relevant Local Authority Local Plan policies. The geology at the site is unlikely to be permeable and such infiltration SuDS solutions are not likely to be appropriate; however, this should be confirmed through further geotechnical investigation. Attenuated discharge to a watercourse or a sewer will also need consideration as part of the development's drainage design.