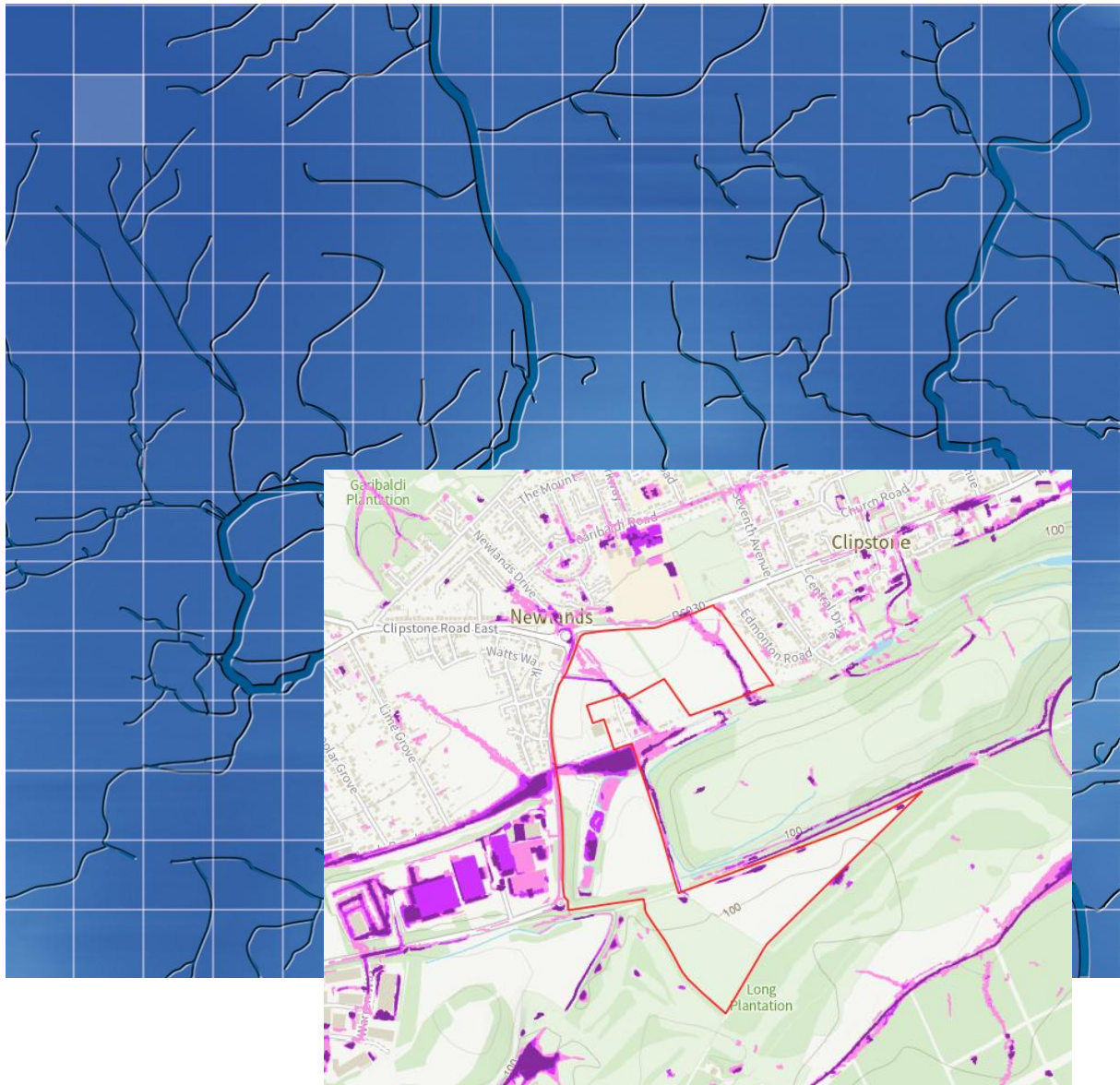


Mansfield District Council

August 2026

Appendix 1 Land South of Clipstone Rd East Level 2 Strategic Flood Risk Assessment



Mansfield District Council

Land South of Clipstone Rd East

Level 2 Strategic Flood Risk Assessment

Document issue details

WHS10323

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For and on behalf of Wallingford HydroSolutions Ltd.

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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	M
Other Sources of Flood Risk	M
Confidence in Assessment	M

Flood Risk

Pluvial flood risk represents the greatest risk of flooding to the site with 4% of the site inundated during a 1.0% AEP +CC event. This flood risk is predominantly associated with two surface water flow paths in the north of the site.

The Flood Map for Planning Surface Water Spatial Planning depth data shows depths are generally less than 150 mm, though some areas have depths up to 600-900 mm. These depths are associated with a small topographic depression in the south of the site and directly within the largest pond at the site.

The risk of fluvial flooding is considered to be low as 97% of the site is located in Flood Zone 1.

The risk from other sources of flooding is considered to be moderate due to the potential for groundwater flooding.

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. Provided no infrastructure is located in flood risk areas the national scale modelling will remain suitable for planning purposes.

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 and outside the surface water flood extents at this site to avoid flood risk to people and property.

However, a sequential approach will need to be followed, to ensure that all residential buildings are outside of the areas at surface water flood risk.

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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 South of Clipstone Rd East, 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 South of Clipstone Rd East is a 45.3ha site. It is located southeast of Forest Town and southwest of Clipstone, see Figure 1. The site is predominantly located on grassland fields with one industrial unit also present within the boundary. Land use surrounding the site is residential and industrial to the north and west, and open rural and recreational land to the south and east. Five ponds are located in sequence in the centre of the site.

The site is a proposed allocation for residential development in the emerging Local Plan review, with a capacity for 315 dwellings. These dwellings are exclusively proposed for the northern portion of the site at this stage which lies north of Newlands Rd. Open space, amenity uses and biodiversity uses (GI & Habitat creation/enhancement) are proposed in the central and southern portions of the site.

2.2 Topography

Based on 1m LiDAR data the site slopes towards the centre where the ponds are located. The ground levels across the site range from 80.7 m AOD to 108.7 m AOD. The average ground level is 93.5 m AOD, see Figure 2.

2.3 Nearby Watercourses

A series of five ponds are located through the centre of the site, they are connected by a small drainage channel, see Figure 1. The drainage channel flows east from the site through Vicar Water Country Park eventually joining the River Maun approximately 3.1 km northeast of the site. Other small drainage channels are present to the southwest and east of the site.

Land South of Clipstone Rd East Level 2 SFRA

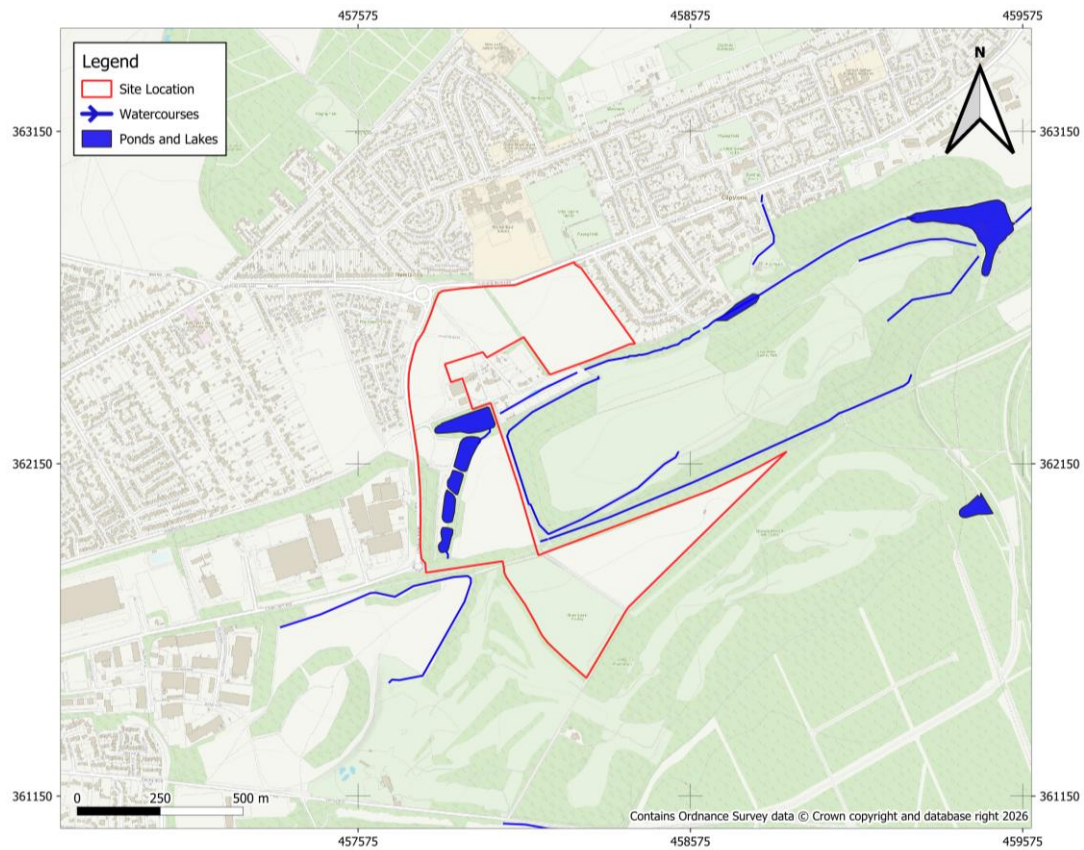


Figure 1 - Site Location

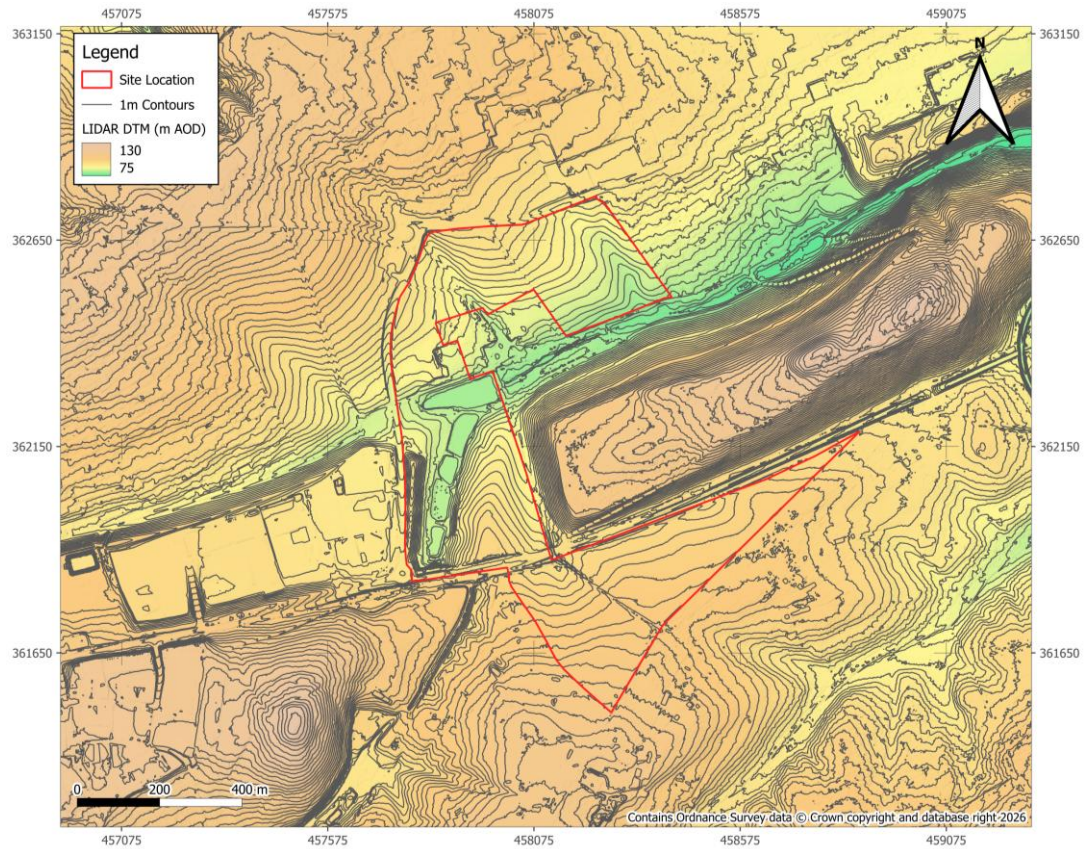


Figure 2 – Topography

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), 3.1% of the site is located in Flood Zone 2 (0.1% Annual Exceedance Probability (AEP)) and 1.6% is located in Flood Zone 3a (1.0% AEP). These Flood Zones consider the undefended scenario whereas Flood Zone 3b (3.3% AEP) considers the defended scenario. For this event, less than 0.1% of the site is located in Flood Zone 3b. These areas of flood risk are mainly associated with the existing ponds within the site, as well as a small area of low-lying land adjacent to a drain in the south of the site, see Figure 3. Note, these areas lie outside of the northern portion of the site where the residential development is proposed.

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 as very limited land outside of the existing ponds is at risk of fluvial flooding. In this regard, no further assessment is required.

3.3 Flood Defence Infrastructure

There is no formal flood defence infrastructure in the vicinity of the site nor is it located within a flood storage area.

3.4 Surface Water Flood Risk

The EA's surface water flood maps show less than 0.4% of the site is inundated in the 3.3% AEP event, 2.4% is inundated in the 1.0% AEP event and 6.3% is inundated in the 0.1% AEP event, see Figure 5. When accounting for climate change the proportions moderately increase to 2.4% in the 3.3% AEP event, 4.4% in the 1.0% AEP event, and 8.1% in the 0.1% AEP, see Figure 6.

Although the extent of surface water flooding is relatively small, the areas at risk are associated with surface water flow paths. Therefore, the risk of surface water flooding is considered to be moderate and is assessed in more detail in Section 4.

3.5 Groundwater Flooding

The site is underlain wholly by Chester formation sandstone, which classed as a highly productive, principal aquifer. No superficial deposits are present. The overlying soils are slightly acidic sandy soils; these are expected to be freely draining.

Based on the data available the risk of groundwater flooding is considered moderate, largely based on the freely draining nature of the overlying soils which could permit a mobile water table. 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 South of Clipstone Rd East Level 2 SFRA

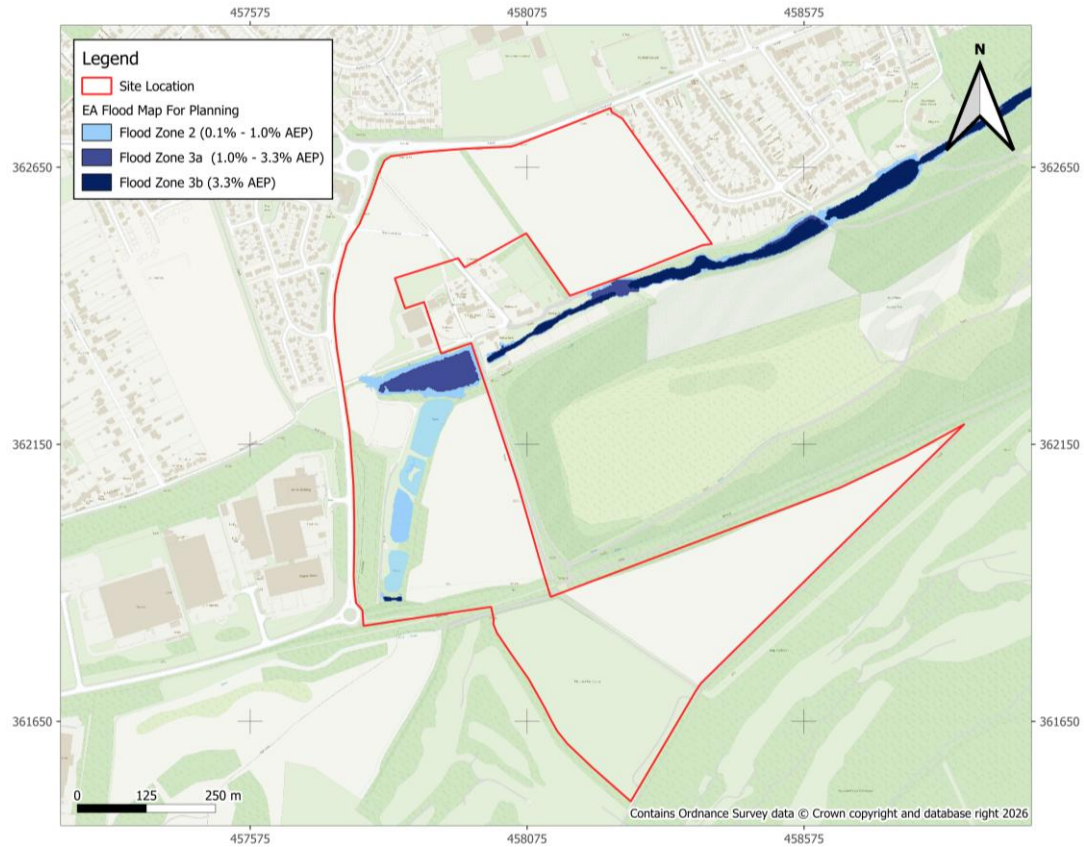


Figure 3 - Fluvial Flood Map

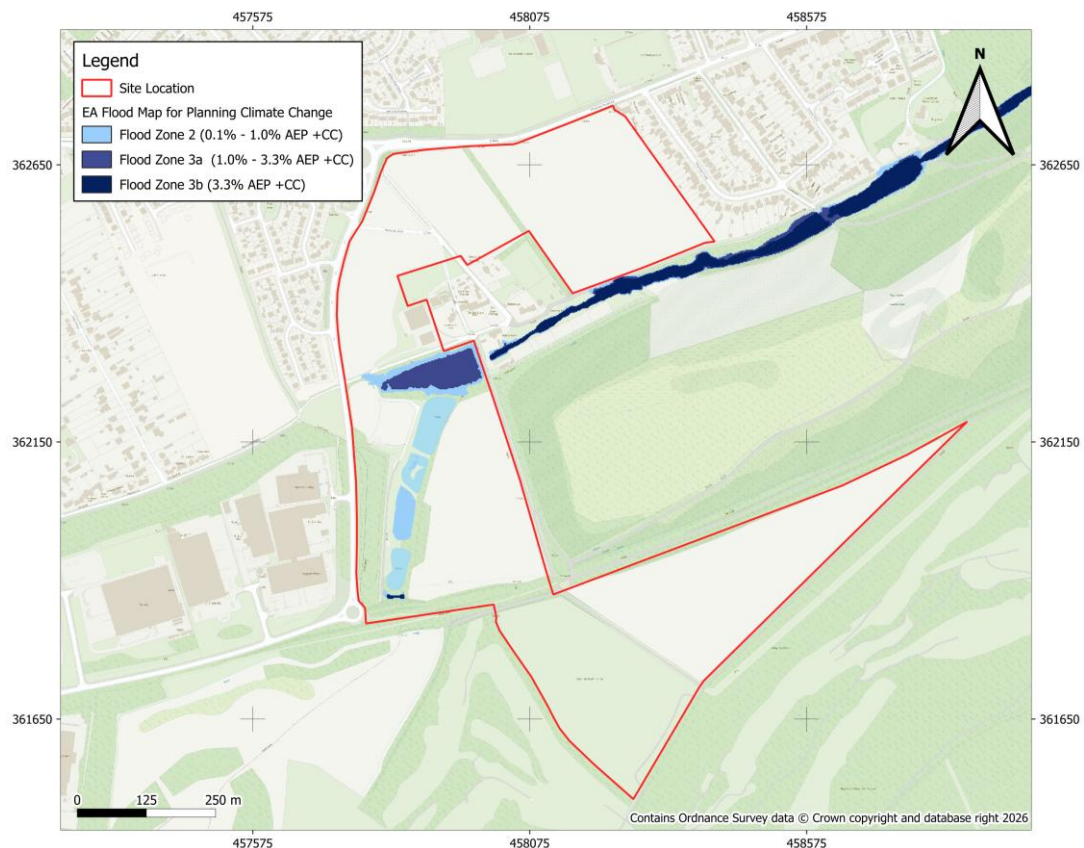


Figure 4 - Fluvial Climate Change Flood Map

Land South of Clipstone Rd East Level 2 SFRA

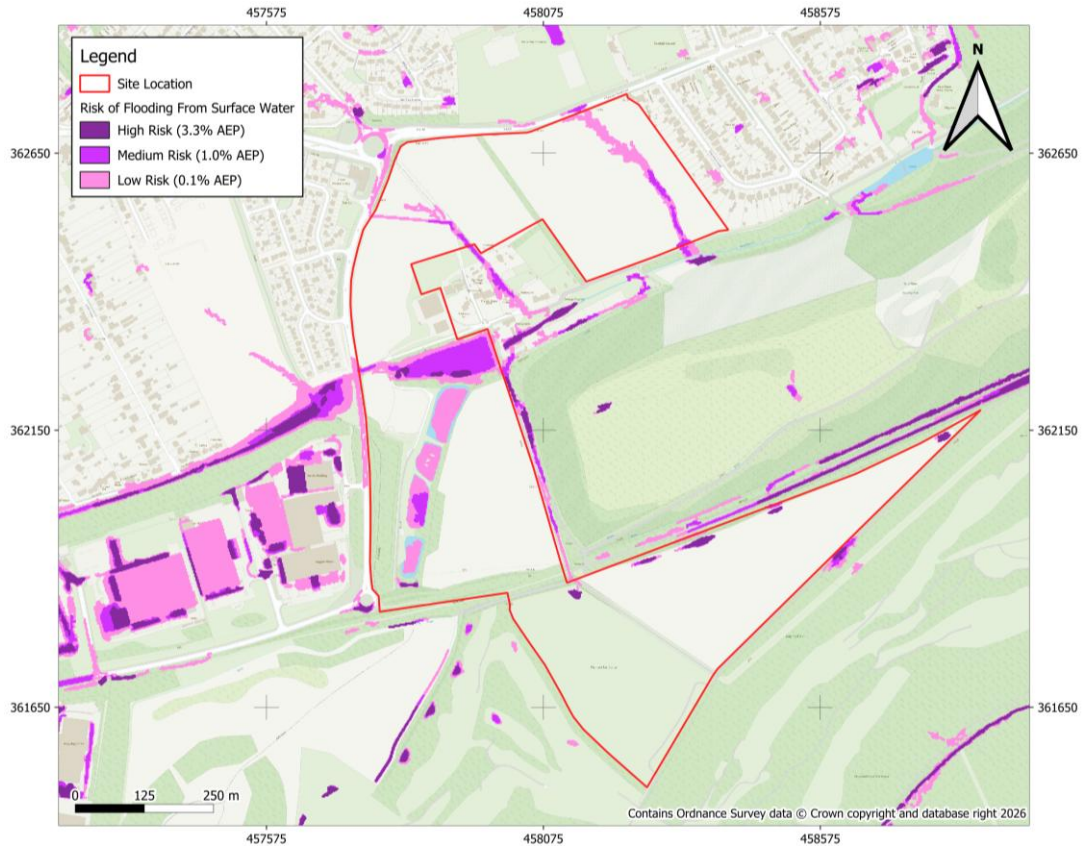


Figure 5 – Surface Water Flood Map

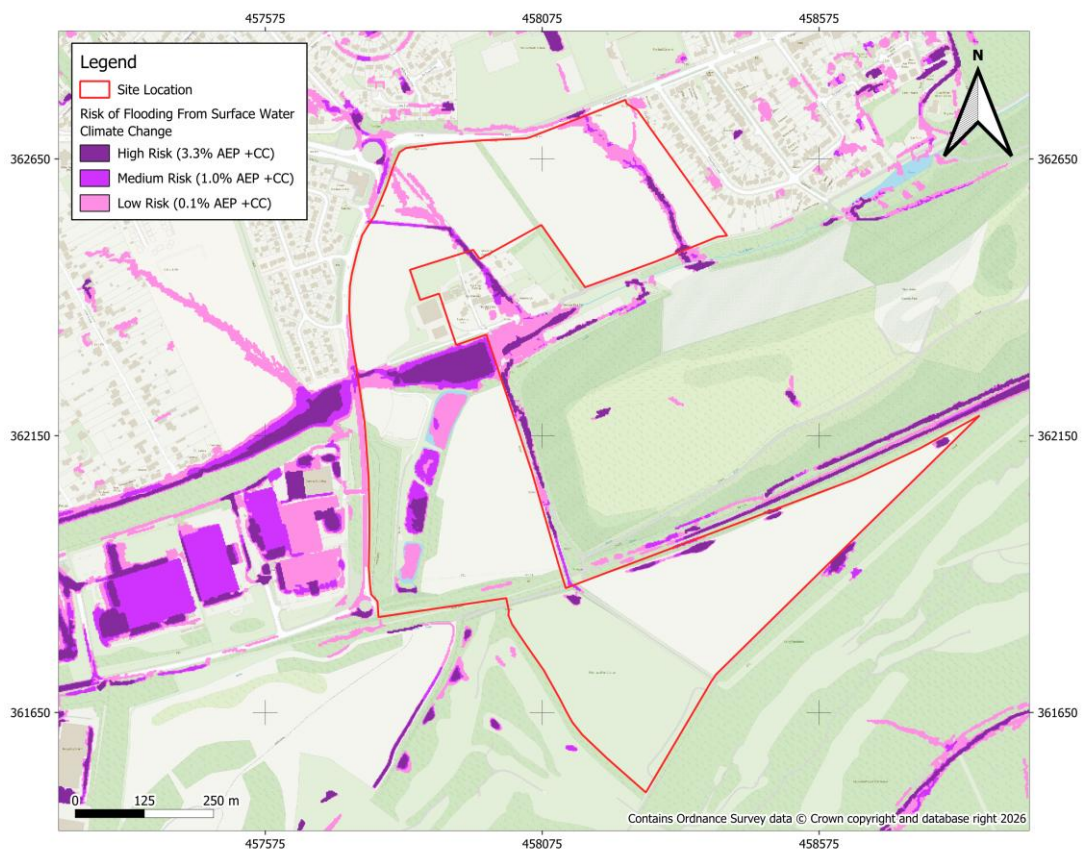


Figure 6 -Surface Water Climate Change Flood Map

Land South of Clipstone Rd East Level 2 SFRA

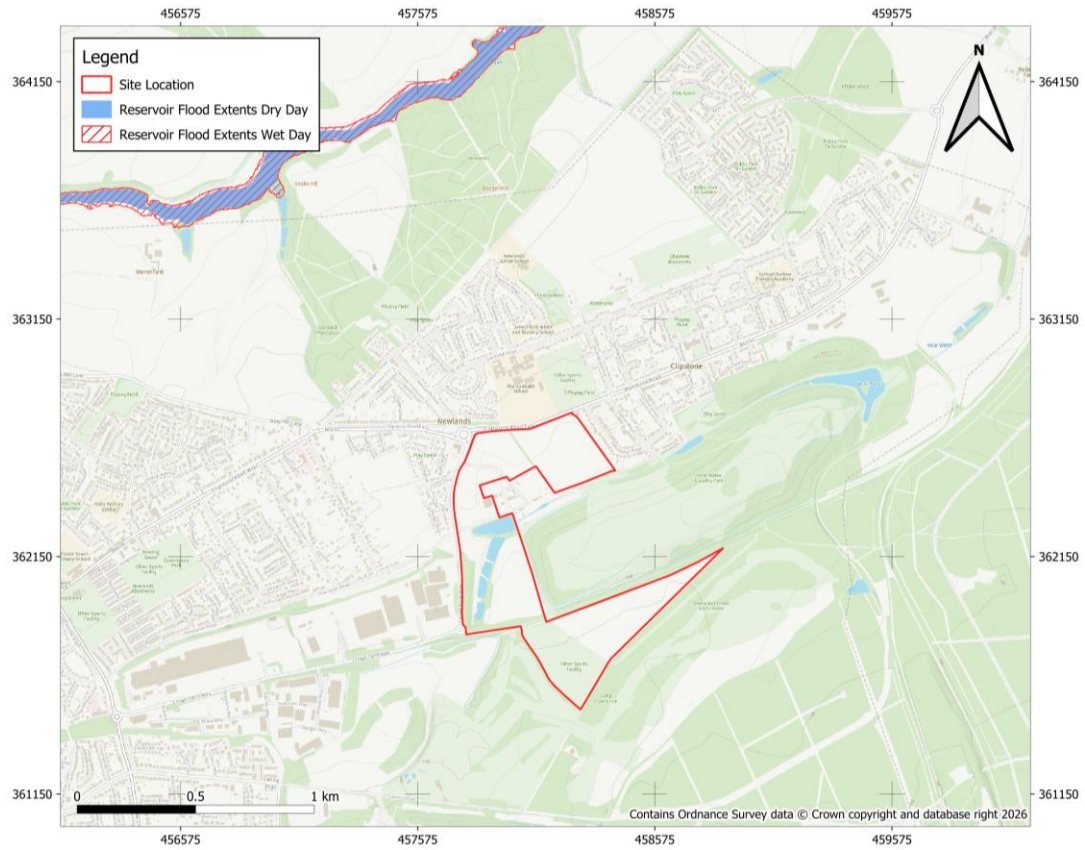


Figure 7 - Reservoir Failure Flood Map

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 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 mainly limited to the area surrounding the largest pond in the centre of the site, and two overland flow paths in the north. Some flooding is also present along the drain in the south of the site. Overall, approximately 4% of the total site area is inundated, see Figure 8.

Flood depths within the two surface water flow routes in the north of the site are generally less than 150 mm though small areas show depths between 150 and 300 mm. The western most surface water path flows along the existing roads in this area, whereas the eastern route follows a small valley through an open field.

The greatest flood depth outside of the existing waterbodies is 600-900 mm and is located at a low point in the topography near to the drain in the south of the site. Other areas of surface water ponding are also present along the edge of the site in the southern fields with depths up to 300-600 mm.

4.3 Access and Egress

As all properties are proposed in the north of the site, the main access and egress route will be via Clipstone Road East/Mansfield Road. During an extreme pluvial flood (0.1% AEP +CC) much of this route remains flood free, with small areas of low flood depths, see Figure 9. The greatest risk along this route is a 50 m stretch of 300-600 mm ponding, however this is limited to the edges of the road. During an extreme fluvial flood event (0.1% AEP +CC) Clipstone Road East/Mansfield Road remains outside of the flood extent.

A site-specific FRA should also consider routes across the site once the development layout is known and assess in more detail the nature of the flood risk to determine how quickly it occurs and the degree of hazard.

Land South of Clipstone Rd East Level 2 SFRA

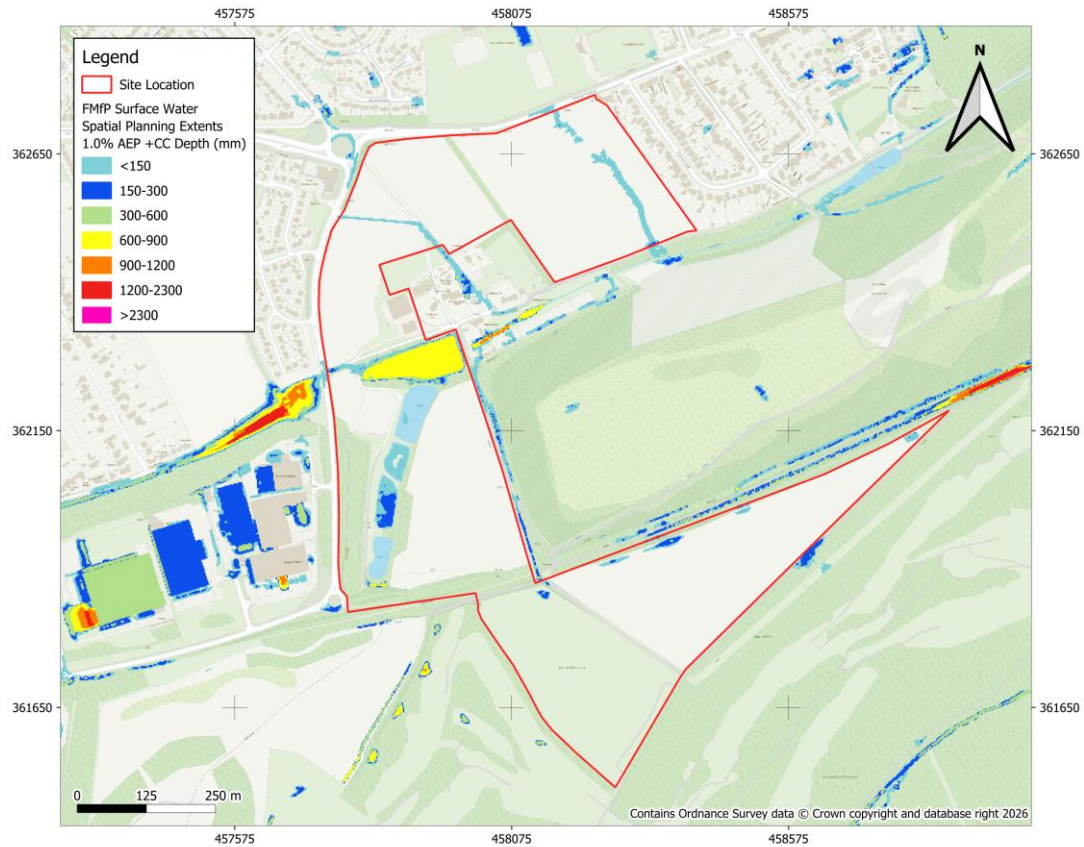


Figure 8 - FMfP Surface Water Spatial Extents - 1.0% AEP + CC Depth

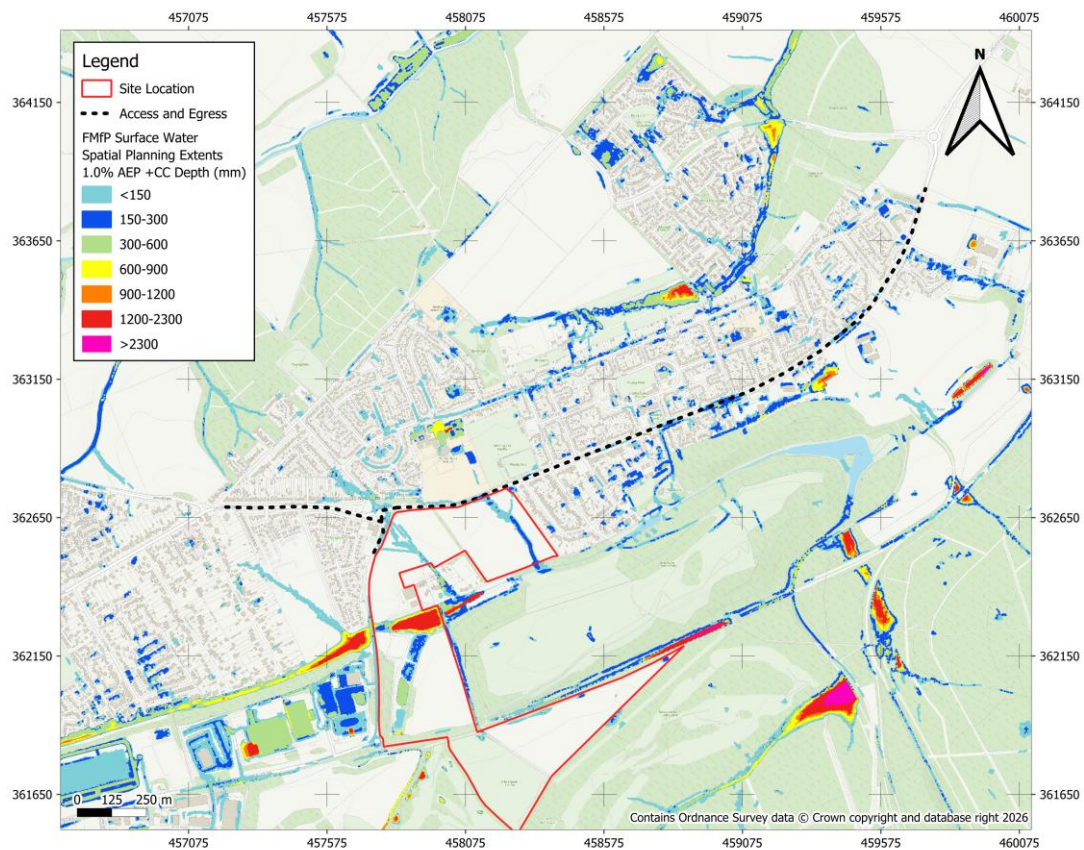


Figure 9 - Access and Egress Routes

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, although the site is at low risk of fluvial flooding, parts of the site are identified as being at risk of surface water flooding based on the Environment Agency's surface water modelling extents. The risk is primarily concentrated around the existing ponds, which are located outside the area proposed for residential development in the north of the site. However, two surface water flow routes extend into the northern part of the site and could affect the proposed residential area.

Given the extent of these flow routes, provided a sequential approach is followed, it should be possible to locate development and associated infrastructure outside areas of surface water flood risk.

5.2 Scale of Development

The total site area is 45.3 ha, allocated for 315 dwellings, however all these dwellings are proposed within the northern 15.8 ha of the site. Assuming medium density housing (35 dwellings per hectare) 315 dwellings would require 9.00 ha of land.

In terms of fluvial flood risk, 97% of the site is located within Flood Zone 1, including the northern part of the site where residential development is proposed. The surface water 0.1% AEP +CC extreme pluvial event inundates 6.6% of the northern area which indicates that 14.75 ha remains flood free during the design event. Therefore, it should be possible to locate all development within the north of the site outside of flood risk areas. This is provided there are no constraints (non-flood related) which require development to be located in at-risk areas.

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, the surface water flood maps should be used to ensure development is prioritised in flood free areas where possible, followed by low risk, medium risk and high-risk areas.

If required ancillary infrastructure such as car parks and green spaces could be located in higher flood risk areas to allow residential properties to be sited in lower risk areas. This is under the assumption that it does not increase flood risk elsewhere and is designed to be appropriately resistant and resilient to flooding.

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. As only national scale modelling is available at the site, if development is proposed within the flood extents, detailed modelling may be required during a site-specific FRA to better inform design flood levels and finished flood levels at the site. However as already noted, it should be possible to locate all development outside of these areas.

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 likely to be permeable and such infiltration SuDS solutions are likely to be appropriate; however, this should be confirmed through further geotechnical investigation. Attenuated discharge to a watercourse or a sewer may also need consideration as part of the development's drainage design.