

Ref	SPCW5
Primary Flood Zone	Flood Zone 1
Vulnerability Classification	Mixed (More vulnerable and Less vulnerable)

Site Details

Site Location:	X:	450722	Address: Oxpens Rd, OX1 1NY
	Y:	205875	
Site Area:	6.3 ha		Additional Information: The site is currently occupied by a Royal Mail depot and the Oxford Ice Rink, along with a large area of hardstanding set back from these.
Proposed Function:	Mixed		
Ground Level Range (m AOD):	55.358m-59.728m		

Fluvial Flood Risk

	1 in 100 Yr (+26%)	1 in 100 Yr (+84% CC)
Percentage Inundated (%)	26%	35%
Average Flood Depth (m)	0.04 m (Max – 0.25m)	0.62 m (Max – 1.77m)
Average Velocity (m/s)	0.28 m/s (Max – 0.44 m/s)	0.08 m/s (Max – 0.63 m/s)
Speed of Onset (hrs)	66 hrs	30 hrs

Summary: The site is at moderate risk of fluvial flooding, with a significant proportion of the site lying within Flood Zone 2 and in Flood Zones 3a and 3b (see fluvial flood map overpage). When accounting for climate change, for the design 100-year (+26% climate change) event, 26% of the site is modelled to be inundated. The hazard map for this event (see hazard map) shows the hazard rating to be *Danger for most* indicating significant flood depths and velocities. Whilst the extent and hazard is greater for the extreme climate change scenario, given the proposed development this scenario should not be relevant. Some of the site also lies within the historical flood map, this was from flood events in 1947, 1977, 1979, 2002 and 2013.

Defence Infrastructure

Description:	Some minor bank protection.
Owner:	Private
Standard of Protection:	N/A
Condition:	2 (Good)

Potential Access & Egress Route: The proposed access and egress route is to head south via the Oxpens Rd, before joining Thames Street. Travel from this point would likely be northwards via the High Street towards low risk areas in North Oxford (see access/egress map overpage).

Flood Risk: The initial parts of the route are shown to be within Flood Zone 2. The hazard rating is generally low at the start of the route which suggests that water is both shallow and slow moving. However, there are pockets of greater hazard (danger for most). For these reasons early warning will be essential.

It should be noted, that the River Thames catchment is dominated by chalk, it has relatively slow river response times to storm events, being groundwater, rather than surface water dominated. This increases the time taken for inundation which should allow for both adequate warnings and preparation in an extreme flood event. Most of the site is also in Flood Zone 1 so should provide safe refuge during an extreme flood event.

Pluvial & Other Sources of Flood Risk

The risk of pluvial flooding has been assessed using the EA surface water flood maps (see pluvial flood map overpage). The majority of the site is not at risk from surface water flooding from all events up to and including the 1000-year event. At risk areas on site are mainly isolated to the existing road network surrounding the site.

The underlying geology at the site comprises loamy and clayey floodplain soils with naturally high groundwater underlain by sedimentary bedrock in the form of Mudstone. In this regard, groundwater flood risk is considered to be moderate.

The EA's Flood Risk from Reservoirs Map shows the site to be at risk during the wet-day scenario, it is not at risk in the dry-day scenario. Reservoir failure is a rare event with a very low probability of occurrence, so this risk is not considered a significant barrier to development at the site. Based on the LLFA's flood incident data, there have been no recent historical flood incidents recorded close to the site.

FRA Implications, SuDS & Exception Test

Hydraulic modelling of the River Thames and its associated tributaries has indicated that the site is at moderate risk of fluvial flooding. A significant proportion of the site lies in Flood Zone 2 and in Flood Zones 3a and 3b. A mixed development with both housing (more vulnerable) and employment (less vulnerable) infrastructure is proposed. The latter is permissible within Flood Zones 2 and 3a, more vulnerable infrastructure is permissible in Flood Zone 2, but must pass an Exception Test as specified in the latest NPPF if located in Flood Zone 3a. Neither is permissible in Flood Zone 3b under any circumstances. When accounting for climate change, 26% of the site is at risk during the design 100-year (+26% Climate change) event.

The site's access route is largely flood free however parts of the route are at risk close to the site. In general flood hazard is low, however adequate flood warning will be necessary to ensuring that the routes can be utilised. A site-specific FRA should look into this in more detail.

The pluvial flood risk at the site is low, being mainly isolated to the existing road network in the site. The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that pluvial flood risk at the site and to third party land is not increased.

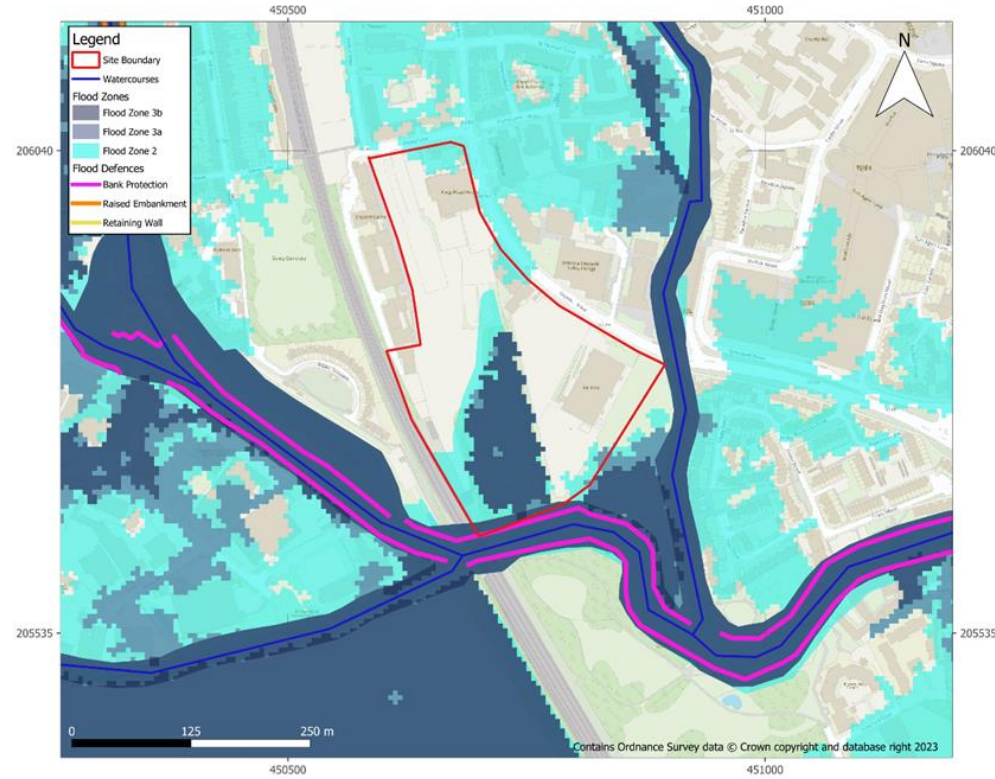
In assessing and demonstrating the viability of any SuDS solution for the site, a site-specific FRA should follow the Non-statutory technical standards for SuDS. The geology at the site consists of loamy and clayey floodplain soils with naturally high groundwater in this regard the use of infiltration SuDS solutions is likely to be limited. It is recommended that a geotechnical investigation is undertaken at this site to obtain further information relating to infiltration rates, this will confirm whether infiltration could be viable in some areas. Attenuated discharge to a watercourse or sewer will also need considering as part of a site-specific FRA.

Overall, a significant proportion of the site (>20%) lies within Flood Zone 3b no development (unless water compatible development) is permissible in this zone. Despite this a mixed-use development should be possible across the rest of the site. However, a sequential approach should be implemented prioritising more vulnerable residential development in Flood Zone 1 and Flood Zone 2 where possible. Less vulnerable employment development is also preferred in these zones however can be located in Flood Zone 3a (without the need for the Exception Test) if more space is required for residential uses.

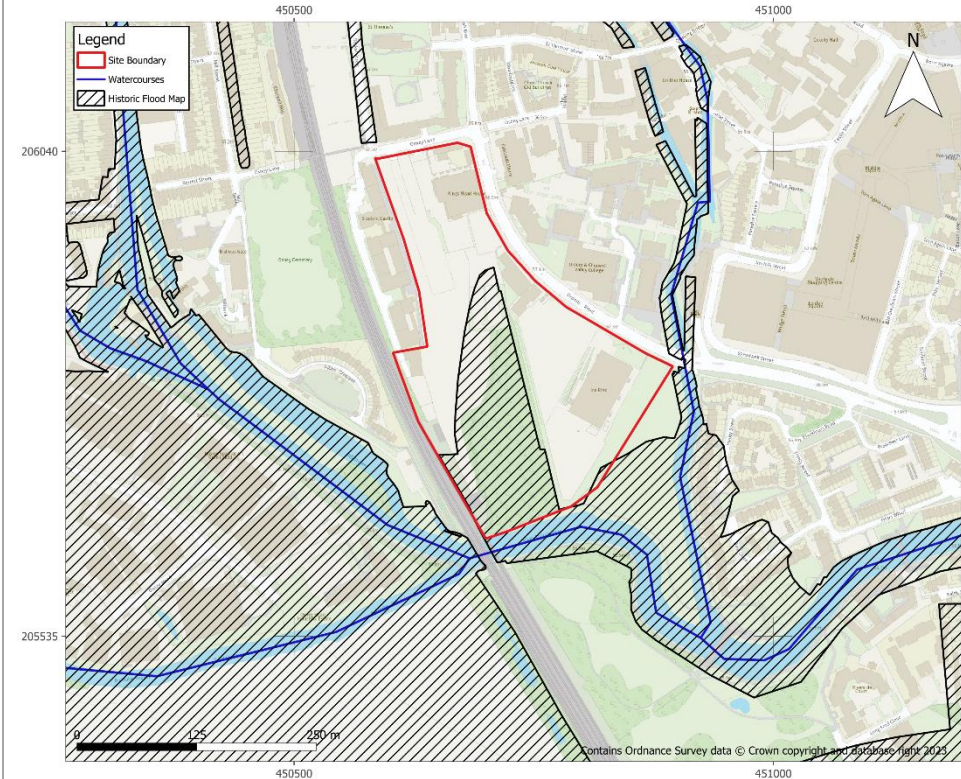
Development may need to be set at a floor level to provide an appropriate freeboard above the flood level for the 100-year (+26% climate change) design event, estimated at 56.66 m AOD in the centre of the site. The majority of the site is higher than these levels, so ground raising should be limited and can be reduced by locating development outside of low-lying areas. A site-specific FRA should confirm any requirements with the EA including the need to provide compensatory storage and assess 3rd party impacts if ground raising is implemented.

Fluvial Hazard	Moderate Risk
Pluvial Hazard	Low Risk
Developable	Flood Zone 3b takes up a significant proportion of the site, however proposed development should be appropriate across most of the site with a sequential approach to development advised

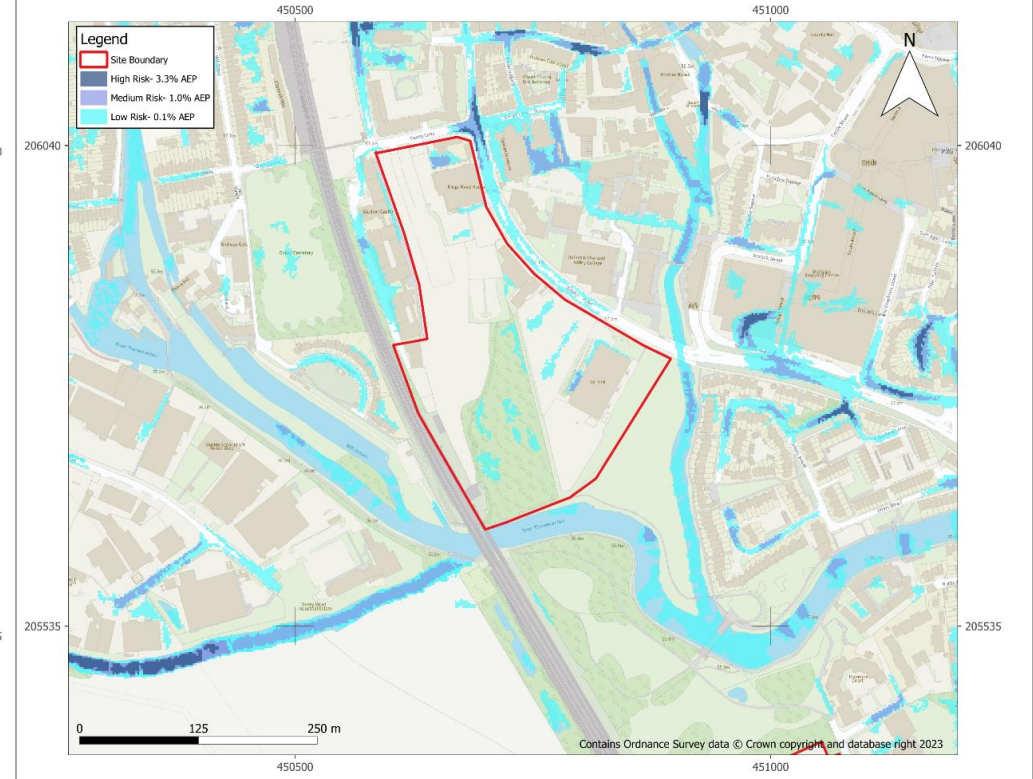
Fluvial Flood Map



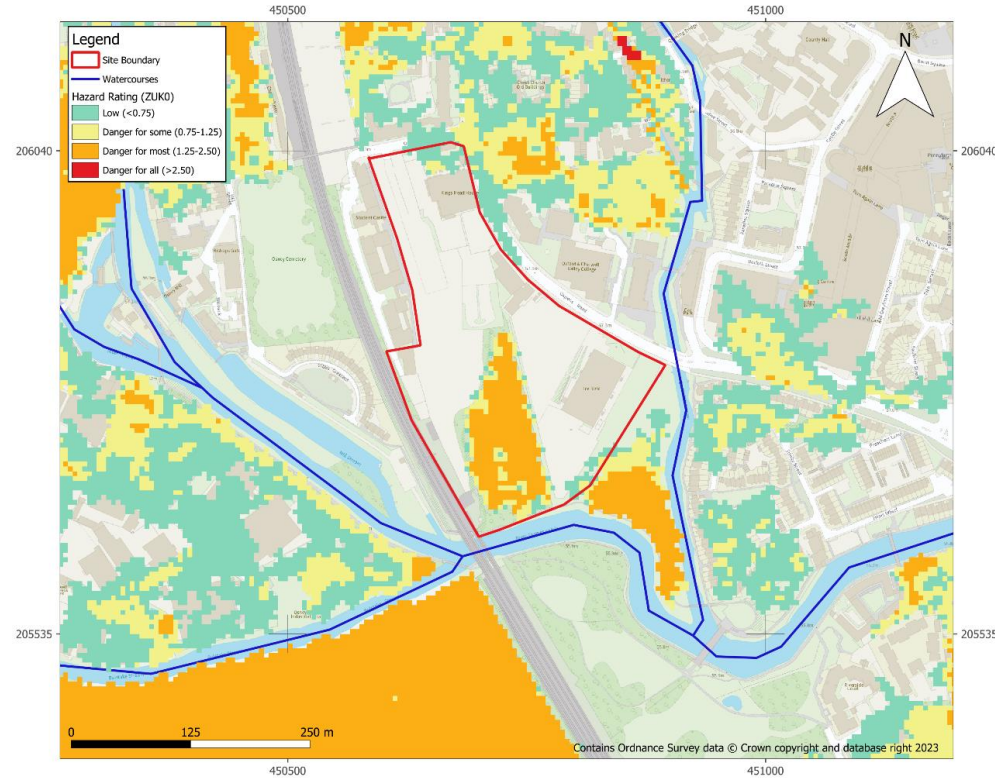
Historical Flood Map



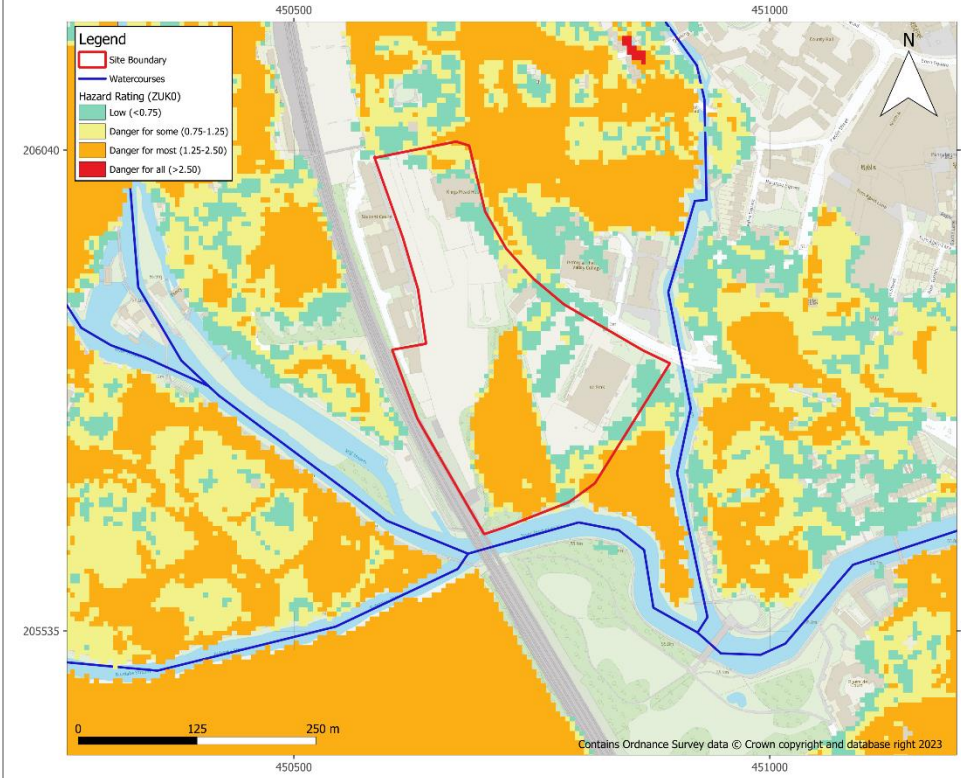
Pluvial Flood Map



Hazard Map (100 Yr + 26% Climate Change)



Hazard Map (100 Yr + 84% Climate Change)



Access/Egress Routes

