EH9 - GIL, Gilston: Gilston Area				
OSNGR: 544060,213119	Area: 697.75ha		Mixed Greenfield and Brownfield	
Flood Zone Coverage: *based on 2D Jflow modelling	**FZ3b** 2.15%*	**FZ3a** 2.65%*	**FZ2** 3.2%*	**FZ1** 92%*

Proposed Development Details:
10,000 homes, primary and secondary education, health, retail and green space.

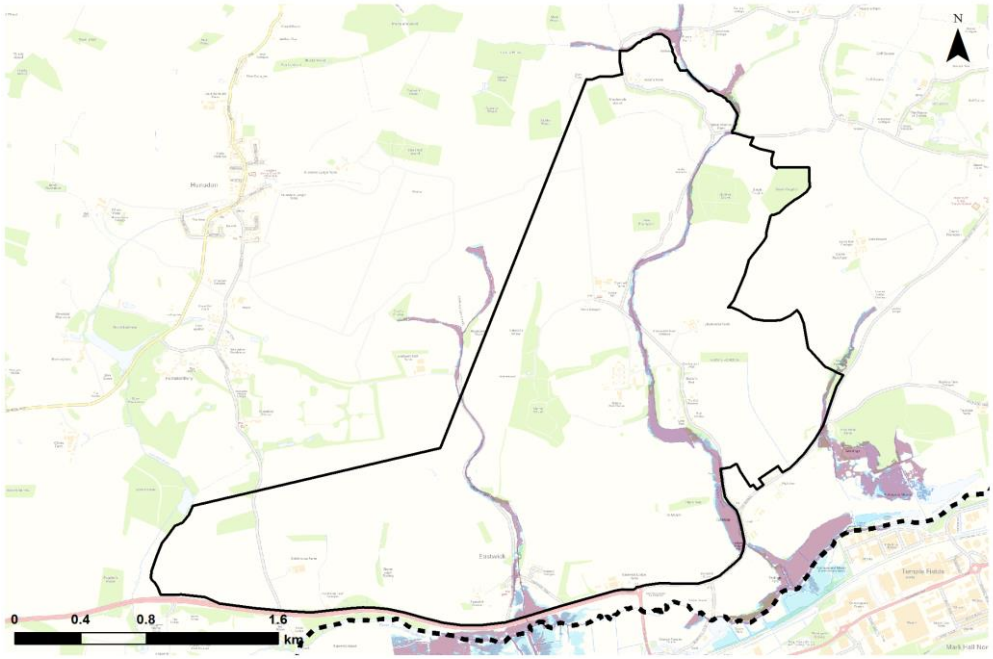
Exception Test Required?
Unlikely, as the majority of the site is located within Flood Zone 1.

The Exception Test is required if:
"More Vulnerable" and "Essential Infrastructure" development is located in FZ3a and for "Highly Vulnerable" development located in FZ2.
"Essential Infrastructure" development in FZ3b will also require the Exception Test.
"Highly Vulnerable" development should not be permitted within FZ3a and FZ3b.
"More Vulnerable" and "Less Vulnerable" development should not be permitted within FZ3b

NPPF Guidance:
• For development proposals on sites comprising one hectare or above in Flood Zone 1, the vulnerability of flooding from other sources as well as from river flooding should be incorporated into a FRA.
• The potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new developmenton surface water run-off should be considered.
• Developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development and through appropriate sustainable drainage techniques.

Sources of Flood Risk:
A very small area of the site is at risk of fluvial flooding from Fiddlers' Brook and and the unnamed drain which flows along Eastwich Hall Lane; both of which flow south to join the River Stort (Navigation) located just outside of the southern site boundary. The vast majority of the site is located in Flood Zone 1 and therefore is at little risk of fluvial flooding. Factoring in climate change at 25%, 30% and 70% does not significantly affect the area at risk of fluvial flooding. Parts of the site are also shown to be affected by surface water flooding; these areas tend to correspond with the watercourses.

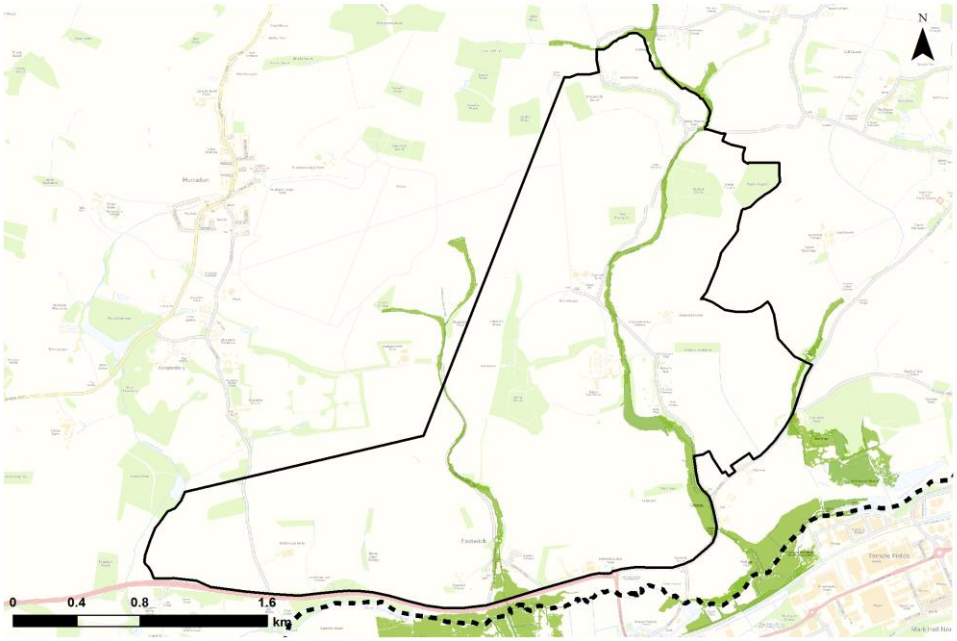
Flood Zone Map



This site was not represented in the Environment Agency's Flood Zones, but OS mapping showed a drain running through the site, therefore 2D generalised modelling using Jflow software has been undertaken to obtain indicative flood extents, using the 20-year extent as FZ3b, the 100-year extent as FZ3a, and the 1,000-year extent as FZ2. Developers may need to consider undertaking more detailed hydraulic modelling at the site as part of a site-specific FRA.

Potential Site Allocations
Council boundary
Flood Zone 3b
Flood Zone 3a
Flood Zone 2

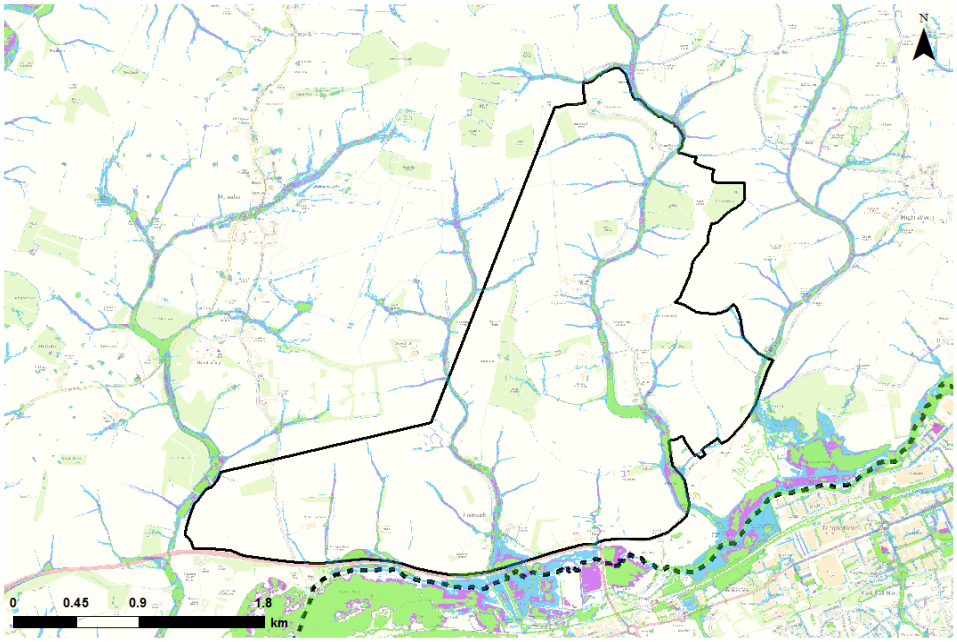
Climate Change Map



Climate change was modelled for the 2080s epoch, applying the following climate change factors to the 100-year flow: 25%, 35% and 70%.
The map above shows the 100-year + 70% climate change scenario, therefore representing a 'worst case'.

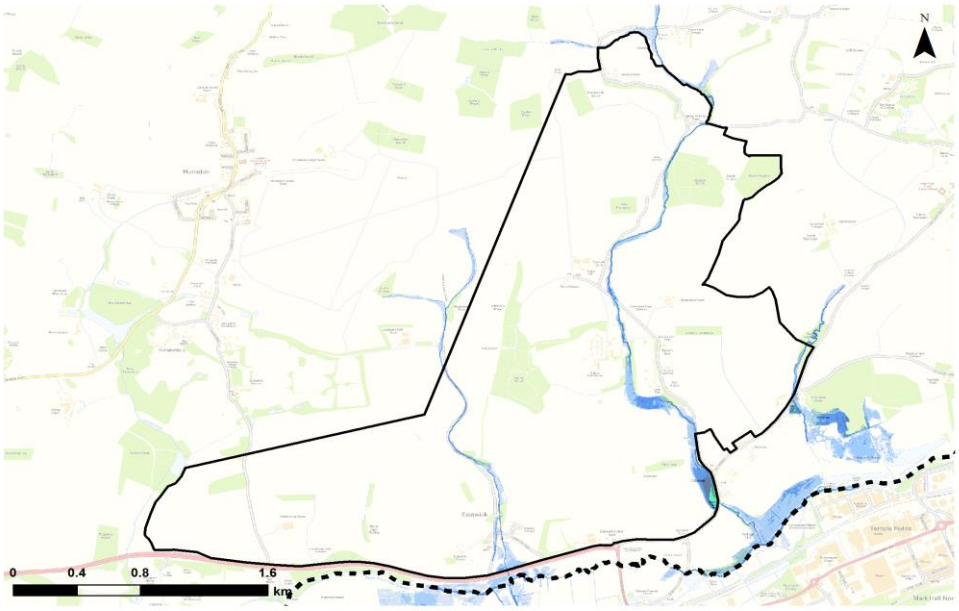
Potential Site Allocations
Flood Zone 3 with Climate Change
Council boundary

Surface Water Map



Potential Site Allocations
Council boundary
uFMfSW* 30-year Extent
uFMfSW* 100-year Extent
uFMfSW* 1,000-year Extent

Depth Map



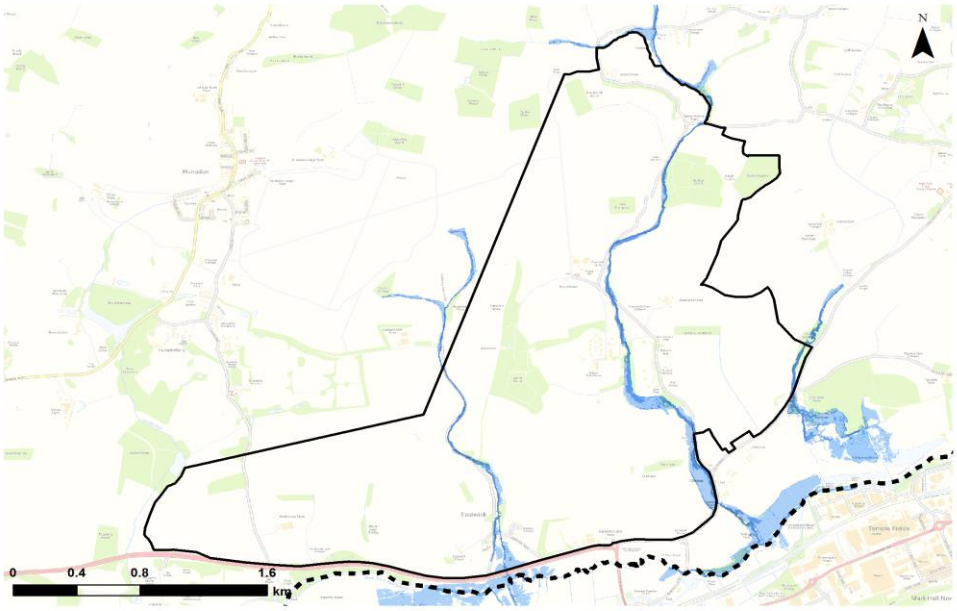
This depth map is an output from Jflow 2D generalised modelling, and represents the 100-year event

Potential Site Allocations
Council boundary

Depth (m)

0 - 0.10
0.10 - 0.50
0.50 - 1.00
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.50
3.50 - 4.00
>4.00

Velocity Map



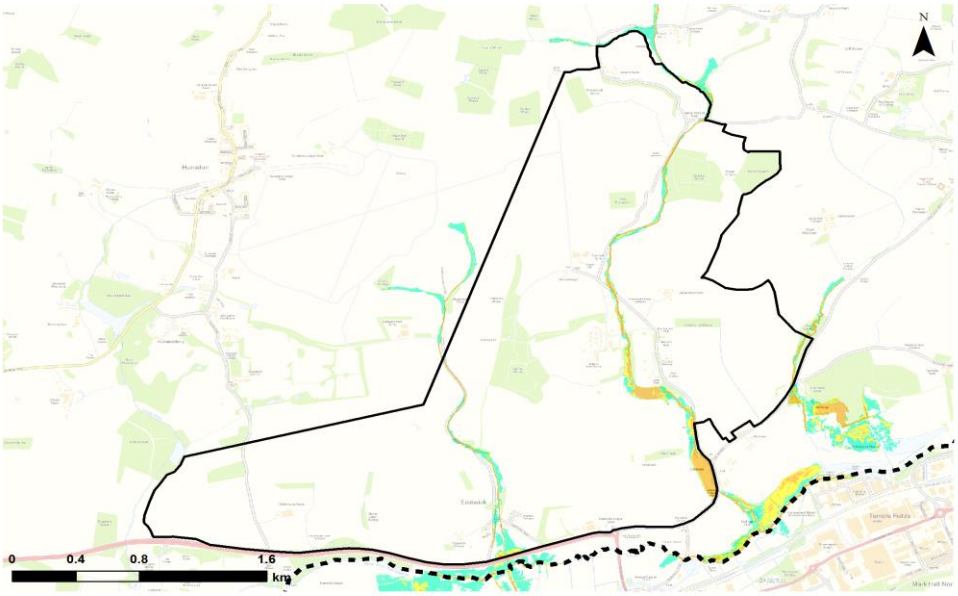
This velocity map is an output from Jflow 2D generalised modelling, and represents the 100-year event

Potential Site Allocations
Council boundary

Velocity (m/s)

0 - 0.2
0.2 - 0.5
0.5 - 1.0
1.0 - 2.0
> 2.0

Hazard Map



This hazard map is an output from Jflow 2D generalised modelling, and represents the 100-year event

Potential Site Allocations
Council boundary

Hazard Rating

Very low hazard - caution
Danger for some
Danger for most
Danger for all

SuDS & the development site:		
SuDS Type	Suitability	Comments
Source Control		Most source control techniques are likely to be suitable.
Infiltration		Mapping suggests split in the risk of groundwater flooding and underlying soils in the site. The southern area of the site near to the boundary, soil type and the aStGWF map indicate that inflitration would not be suitable. The remander of the site infiltration, most infiltration techniques are likely to be suitable. Further site investigation should be carried out to assess
Detention		This option may be feasible provided site slopes are < 5% at the location of the detention feature. If the site has groundwater issues or contamination issues in areas of brownfiels, a liner will be required.
Filtration		This feature is probably suitable provided site slopes are <5% and the depth to the water table is >1m. If the site has contamination or groundwater issues, a liner will be required.
Conveyance		All forms of conveyance are likely to be suitable. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. If the site has contamination or groundwater issues; a liner will be required.

The site is not designated by the Environment Agency as previously being a landfill site.

A proportion of the site is located with a Source Protection Zone. Techniques such infiltration should only be used where there are suitable levels of treatment is possible or infiltration may not be permitted.

Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints

Drainage strategies should demonstrate that an appropriate number of treatment stages have been delivered. This depends on the factors such as the type of development, primary source of runoff and likelihood of contamination. Guidance should be sought from LLFA and other guidance documents such as the CIRIA SuDS Manual (C753).

Flood Defences:
There are no flood defences at this site.

Flood Warning:
This site is partly covered by 'The River Stort at Harlow including Roydon' Flood warning Area following three of the watercourses which intersect the site. Two small areas along the southern boundary are covered by 'The River Stort, Stansted Brook and their tributaries from Clavering to Hoddesdon including Stanstead Mountfitchet, Bishops Stortford, Sawbridgeworth and Harlow ' Flood Alert Area (062WAF51Stort).

Access & Egress:
Access and egress to the site is possible via the A414, Eastwick Road, Eastwick Hall Lane, Church Lane and two unnamed roads to the north of the site. The majority of these roads are impacted by surface water flooding according to uFMfSW and fluvial flooding. Consideration is needed as to how safe access and egress can be achieved to the whole site in times of flood. Fluvial flood risk divides the site; it is important that development across the site has safe access and egress in times of flooding.

Climate Change:

Climate change mapping indicates the following impacts for the future:
• Increased storm intensities.
• The increase in Flood Zone 3a outline with differing climate change allowances is minimal within the site boundary.
• The floodplain of the unnamed drain appears to be fairly constrained within this area; with 70% climate change allowance the flood outline is similar to Flood Zone 2. It may, however, increase the depth, velocity and hazard of flooding in the area affected.
• Climate change may also increase the extent, depth and frequency of surface water flooding.

Implications for Development:
•Use of the Sequential approach means, given the size of the site, development can be placed away from the Flood Zones, with the area affected by the Flood Zones left undeveloped.
• The main access and egress routes are affected by surface water flooding in some places, therefore safe access and egress will be required by development, or safe refuge provided if evacuation is not possible during a flood for the lifetime of the development.
• Climate change may increase the extent of surface water and fluvial flooding in the future and have the potential to affect routes.
• Development should also ensure that there is no increase in flood risk that may exacerbate flooding to access and egress routes
•Broadscale assessment of suitable SuDS has indicated a number of different types may be possible.
• The site is not covered by the Environment Agency's Flood Warning Service. However, if development is placed outside of the Flood Zones, then access to a Flood Warning would not be required.
• The site is not known to benefit from any flood defences. Given the size and location of the site, it is possible the site could be used to implement strategic solutions to alleviate flood risk downstream from the drains; development should consider the feasibility of including any strategic flood risk solutions, depending on the land available.

Guidance for Developers:

• At the planning application stage, a site-specific Flood Risk Assessment will be required if any development is located within Flood Zones 2 or 3 or greater than 1ha in size. Other sources of flooding should also be considered.

• Consultation with the Local Authority and the Environment Agency should be undertaken at an early stage, to determine requirements for a FRA and to establish an approach to consider climate change in line with latest guidance.

• The peak flows of the unnamed watercourse should be considered when considering drainage.

• Resilience measures will be required if buildings are situated in the flood risk area.

• Safe access and egress will need to be demonstrated; currently access and egress is affected by fluvial and surface water flooding.

• Assessment for runoff should include allowance for climate change effects.

• New or re-development should adopt exemplar source control SuDS techniques to reduce the risk of frequent low impact flooding due to post-development runoff.

• New development must seek opportunities to reduce overall level of flood risk at the site, for example by:

  o Reducing volume and rate of runoff
  o Relocating development to zones with lower flood risk
  o Creating space for flooding.
  o Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.

• Onsite attenuation schemes would need to be tested against the hydrographs for any unnamed watercourses to ensure flows are not exacerbated downstream within the catchment.

• Developers may need to undertake more detailed investigations/ modelling of the unnamed watercourse to confirm flood risk at the site. The Jflow outputs present an indication of flood risk in the absence of Environment Agency Flood Zones; however, this does not incorporate channel/ structure topographic survey and assumes a channel capacity of QMED.