

# **Halton Borough Council Local Plan Site Screening**

**Level 2 Strategic Flood Risk  
Assessment – Site W18 Screening**

**Draft Report**

**July 2019**

**[www.jbaconsulting.com](http://www.jbaconsulting.com)**



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## Revision history

| Revision Ref/Date | Amendments | Issued to      |
|-------------------|------------|----------------|
| P01 / July 2019   | N/A        | Alasdair Cross |
|                   |            |                |
|                   |            |                |

## Contract

This report describes work commissioned by Anne Moyers, on behalf of Halton Borough Council, by an email dated 3 May 2019. Hannah Bishop, Joseph Landells-Molloy and Mike Williamson of JBA Consulting carried out this work.

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# 1 W18 (DALP Sub)

| Proposed Site                                                | W18 (DALP Sub)  |
|--------------------------------------------------------------|-----------------|
| Site area (ha)                                               | 1.63            |
| Existing use                                                 | Open space      |
| Existing flood risk vulnerability classification             | Less vulnerable |
| Proposed use                                                 | Residential     |
| Proposed development flood risk vulnerability classification | More vulnerable |
| Proposed development impermeable area (ha)                   | 1.39            |

Flood outlines (current day)

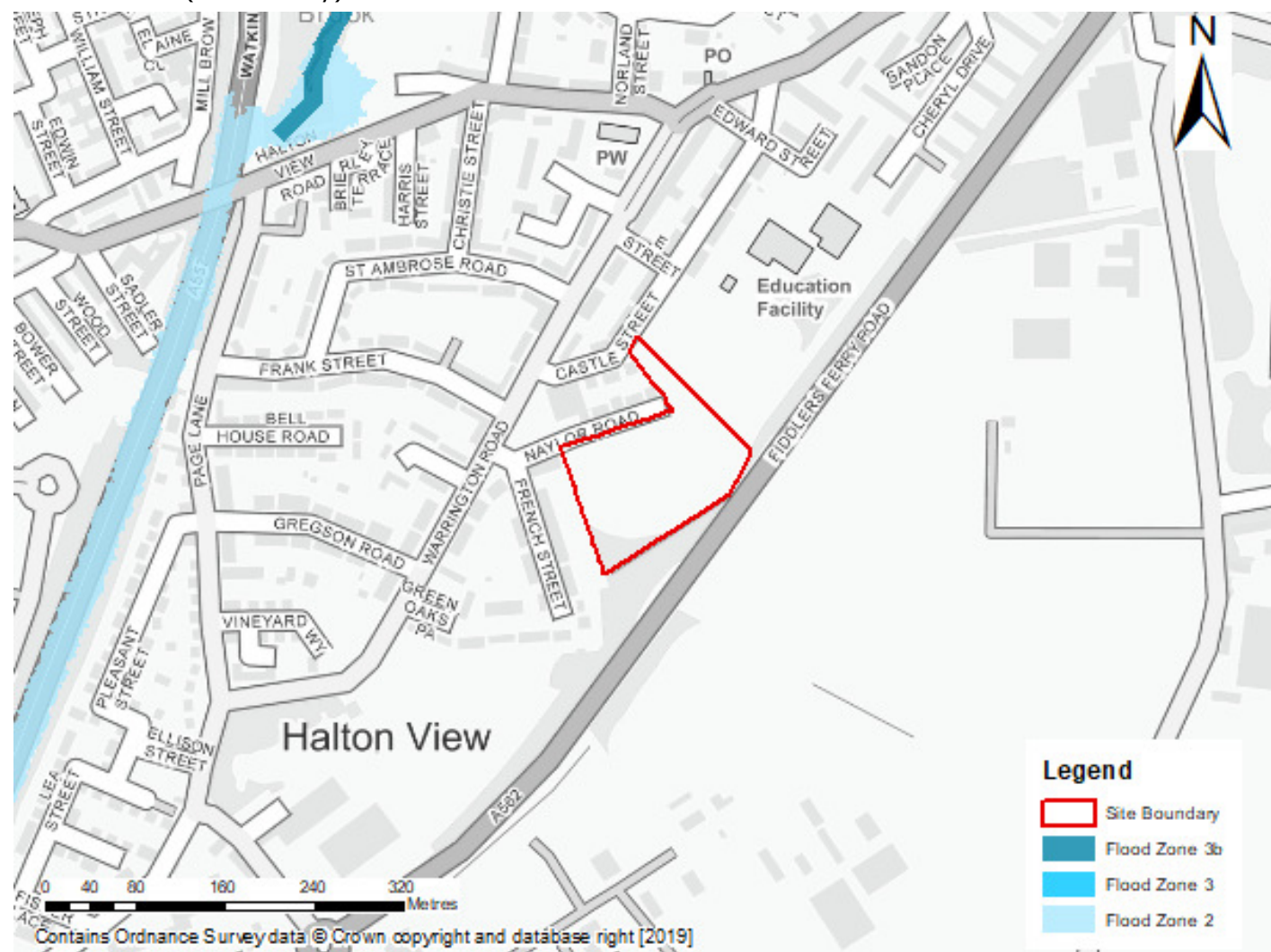


Figure 1-1: Flood Zone Mapping with Flood Defences (no flood zone mapping immediately close to the site)

## Proposed Site

## W18 (DALP Sub)



Figure 1-2: Site with 1m LIDAR (elevation data)

- The surrounding area to the north-east of the site sees ground levels rising to approximately 22m AOD compared to elevation within the site at approximately 17m AOD.

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## Observations

- Allocation should be possible at this site assuming the recommendations in this Level 2 assessment were followed. An FRA will be required to address surface water risk through site layout and design, SuDS and a drainage strategy.
- The proposed vulnerability classification will change from less vulnerable to more vulnerable, according to the NPPF.
- The site is 100% within Flood Zone 1 with development allowed at this location.
- There is no fluvial or tidal flood risk according to flood zone mapping, this is corroborated by the modelled outputs produced from the Mersey Estuary 2016 model.
- Surface water presents the greatest flood risk to the site.

| Proposed Site                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                              | W18 (DALP Sub) |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <ul style="list-style-type: none"><li>Approximately 10% of the total site area is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m (see Figure 1-3). The extent of flooding in the 3.33% and 1% AEP events is limited to a localised depression at the southern bound of the site.</li><li>Safe access and egress are achievable via Fiddlers Ferry Road towards the northeast of the site based on the 1% AEP outline.</li></ul> |                                                                                                                                                                                                                                                                                                                              |                |               |
| Flood Source: Fluvial/Tidal                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                              |                |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Flood Zone 2                                                                                                                                                                                                                                                                                                                 | Flood Zone 3a  | Flood Zone 3b |
| Flood Zones (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                                                                                                                                                                                                                                                                         | 0.00           | 0.00          |
| Tidal: Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                        | N/A                                                                                                                                                                                                                                                                                                                          | N/A            | N/A           |
| Tidal: Hazard                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                                                                                                                                                                                                                                          | N/A            | N/A           |
| Modelled Flood Risk and Climate Change                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"><li>The site lies outside any modelled flood risk from fluvial and/or tidal sources.</li></ul>                                                                                                                                                                                             |                |               |
| Historic Flooding                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"><li>The site lies outside of any Environment Agency historic flood outlines.</li></ul>                                                                                                                                                                                                     |                |               |
| Defences                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"><li>There are no flood defences located close to the site according to the EA's spatial flood defence database.</li></ul>                                                                                                                                                                  |                |               |
| Flood Warning Area (FWA)                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"><li>The site is not located within any current EA FWA.</li></ul>                                                                                                                                                                                                                           |                |               |
| Mitigation options & site suitability                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"><li><b>Allocation would be possible at this site assuming the recommendations in this Level 2 assessment were followed</b></li><li><b>The entirety of the site lies within Flood Zone 1, outside fluvial or tidal modelled risk outlines from the Mersey Estuary 2016 model.</b></li></ul> |                |               |
| Flood source: Groundwater                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                              |                |               |
| Flood risk: groundwater                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"><li>Data unavailable. Possible risk from groundwater must be assessed as part of an FRA.</li></ul>                                                                                                                                                                                         |                |               |
| Flood Source: Infrastructure Failure – Reservoirs                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                              |                |               |
| Flood risk: reservoirs                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"><li>The site is not located within reservoir flood extents according to the EA's Reservoir Flood Map (RFM).</li></ul>                                                                                                                                                                      |                |               |
| Flood Source: Infrastructure Failure – Canals                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                              |                |               |
| Flood risk: canal                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"><li>Data unavailable but the site lies north of the St Helen's Canal. This data should be acquired and consulted as part of an FRA.</li></ul>                                                                                                                                              |                |               |
| Flood Source: Surface Water                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                              |                |               |
| Surface Water Flood Risk to Proposed Development Site                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                              |                |               |

**Proposed Site**

**W18 (DALP Sub)**

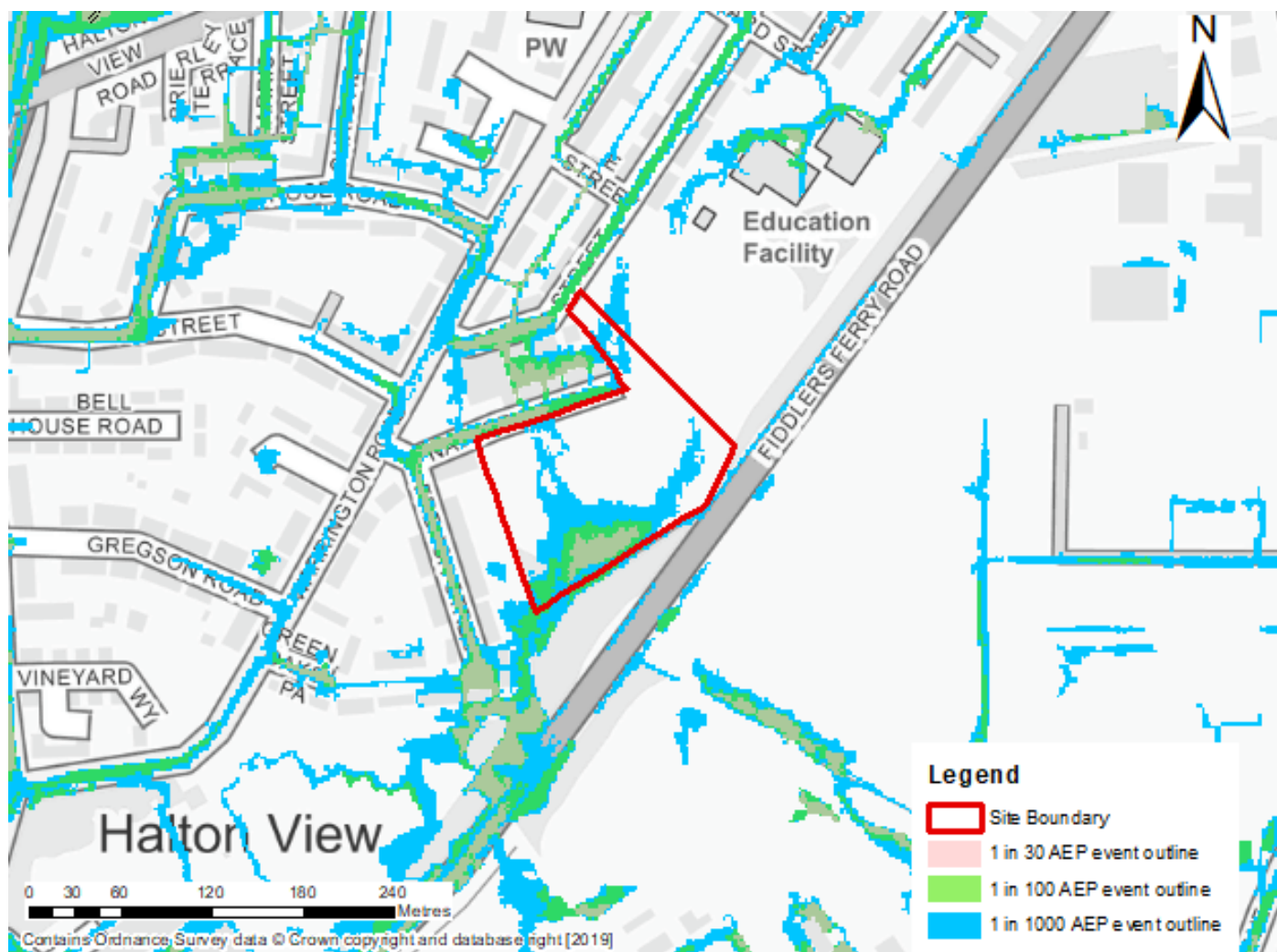


Figure 1-3: Surface Water Flood Risk to the site

| Existing development risk of flooding from surface water (%) | High Risk (3.33% AEP outline)                                                                                                                                                         | Medium Risk (1% AEP outline) | Low Risk (0.1% AEP outline)        |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------|
|                                                              | 4.29                                                                                                                                                                                  | 10.42                        | 33.75                              |
| Surface water flooding depths                                | Max: 0.15-0.30m                                                                                                                                                                       | Max: 0.30-0.60m              | Max: 0.60-0.90m                    |
| Surface water hazards                                        | Max: Moderate<br>Mean: Low                                                                                                                                                            | Max: Moderate<br>Mean: Low   | Max: Significant<br>Mean: Moderate |
| Climate change                                               | <ul style="list-style-type: none"> <li>The current day 0.1% AEP outline provides an indication of the likely increase in extent of the more frequent events.</li> </ul>               |                              |                                    |
| Surface water: flood risk to development site                | <ul style="list-style-type: none"> <li>Approximately 10% of the total site area is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m.</li> </ul> |                              |                                    |

| Proposed Site                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | W18 (DALP Sub)                                      |                     |                              |                                              |                                                      |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------|------------------------------|----------------------------------------------|------------------------------------------------------|
|                                                                                                   | <ul style="list-style-type: none"><li>The extent of flooding in the 3.33% and 1% AEP events is limited to a localised depression at the southern bound of the site.</li><li>The main access route via Fiddlers Ferry Road is shown to be at very low risk of flooding.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                     |                     |                              |                                              |                                                      |
| Surface water: mitigation options & site suitability                                              | <ul style="list-style-type: none"><li><b>Allocation would be possible at this site assuming the recommendations in this Level 2 assessment were followed. An FRA will be required to address surface water risk through site layout and design, SuDS and a drainage strategy.</b></li><li><b>Development should avoid the 1% AEP outline – approximately 10% of the total site area. This should be achievable given the risk is located in one area of ponding in the south of the site.</b></li><li><b>Safe access and egress are achievable via Fiddlers Ferry Road towards the northeast of the site based on the 1% AEP outline.</b></li><li><b>Surface water runoff should be fully attenuated to the greenfield runoff rate, and as such, ensure that there is no increase in surface water flood risk elsewhere. The required volumes of attenuation have been calculated below.</b></li><li><b>The site is greenfield and therefore, infiltration SuDS may be feasible (subject to Ground Investigation) where existing low-lying areas that are currently showing localised ponding may be utilised for attenuation.</b></li></ul> |                                                     |                     |                              |                                              |                                                      |
| Indicative Surface Water Flood Risk from Proposed Development (for Proposed Site in its Entirety) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                     |                     |                              |                                              |                                                      |
| Proposed Development limiting runoff rate: Greenfield – FEH Statistical                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Qbar: 9.65 l/s<br>Q30: 16.41 l/s<br>Q100: 20.08 l/s |                     |                              |                                              |                                                      |
| Design flood event (inc CC)                                                                       | Critical storm duration (Hrs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Inflow volume (m³)                                  | Outflow volume (m³) | Attenuation required (m³)    | Time to empty assuming no infiltration (Hrs) | Total storage required: Area (ha) and % of site area |
| 3.33% AEP Rainfall + 20%                                                                          | 3.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 649                                                 | 145                 | 504                          | 12.1                                         | 0.034 ha<br>2.061 %                                  |
| 3.33% AEP Rainfall + 40%                                                                          | 4.25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 790                                                 | 176                 | 615                          | 14.8                                         | 0.041 ha<br>2.515 %                                  |
| 1% AEP Rainfall + 20%                                                                             | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 908                                                 | 202                 | 706 (202 exceedance storage) | 13.9                                         | 0.047 ha<br>2.888 %                                  |
| 1% AEP Rainfall + 40%                                                                             | 4.75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1100                                                | 240                 | 859 (244 exceedance storage) | 16.9                                         | 0.057 ha<br>3.513 %                                  |

| Proposed Site                                                        |  | W18 (DALP Sub)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate change                                                       |  | <ul style="list-style-type: none"><li>Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.</li></ul>                                                                                                                                                                                                                                                |
| Surface water: flood risk impacts from development site & mitigation |  | <ul style="list-style-type: none"><li>As part of this Level 2 Screening we have included calculations to provide an estimated land take if a pond with an assumed depth of 1.5m was included as part of the development.</li><li>Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.</li></ul> |

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