Sandwell Metropolitan Borough Council Level 2 Strategic Flood Risk Assessment
Detailed Site Summary Tables

Site details	
Site Code	SEC1-7
Address	Land off Bilport Lane, Wednesbury
Area	3.38ha
Current land use	Brownfield
Proposed land use	Employment
Flood Risk Vulnerability	Less vulnerable
Sources of flood risk	
Location of the site within the catchment	The site is located to the west of Bilport Lane. The site is in a urban area, with industrial land to the north, west, south and east. The site is located in the River Tame catchment, the watercourse is approximately 10m north of the site, which drains most of the borough and eventually flows into the River Trent and River Severn respectively. Additionally, the Tame Valley Canal is approximately 120m south of the site.
Topography	Environment Agency 1m resolution LiDAR across the site shows that ground levels are relatively flat. The highest point of elevation within the site is 126m AOD on the eastern boundary. The lowest elevation is 122m in the southeastern section of the site. A railway line also runs 25m east of the site, and the embankment is 127m AOD
Existing drainage features	The River Tame flows along the northern boundary of the site and the Tame Valley Canal is 120m south of the site. Two bridges run over the River Tame watercourse. The first is along Holloway Bank, 190m east of the site. The second is along Smith Road 140m west of the site. A bridge also runs over the Tame Valley Canal, on Holloway Bank, 250m east of the site. As a brownfield site it is likely to drain into the surface water sewer network, which will likely drain to the River Tame.
Critical Drainage Area	The site is not located within a Critical Drainage Area (CDA).
Fluvial and tidal	**The proportion of site at risk FMFP:** **FZ3 – 1.18%** **FZ2 – 3.81%** **FZ1 – 95.01%** *The Flood Zone values quoted show the percentage of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone. This is because the values quoted are the area covered by each Flood Zone/extent within the site boundary. For example: Flood Zone 2 includes Flood Zone 3. Flood Zone 1 is the remaining area outside Flood Zone 2 (FZ2+ FZ1 = 100%).* **Available data:**

	Proportion of the sites at flood risk are determined from the Environment Agency's Flood Map for Planning Flood Zones and River Tame Fluvial Modelled Outputs. This represents the undefended scenario. **Flood characteristics:** The FMfP shows that Flood Zone 3 encroaches along the northern boundary of the site, affecting a small section of the northwest and northeast boundary. Flood Zone 2 also encroaches the northern boundary but also floods along the eastern boundary of the site. The Fluvial data from the River Tame Model is a 1D-only model. Depth, Velocity and Hazard data are not available. Actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs). The Fluvial Present Day flooding shows similar results to the FMfP.
Surface Water	**Proportion of site at risk (RoFfSW):** **3.3% AEP** – 0.57 % Max depth – 0.3 – 0.6m Max velocity – 0.0 – 0.25m/s **1% AEP** – 2.32% Max depth – 0.9 – 1.2m Max velocity – 0.5 – 1m/s **0.1% AEP** – 17.13% Max depth – >1.2m Max velocity – 1 - 2m/s *The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP event includes the 3.3% AEP event).* **Available data:** The Environment Agency's Risk of Flooding from Surface Water mapping was used in this assessment. **Description of surface water flow paths:** The site is essentially at no risk of surface water flooding in the 3.3% AEP event, except for a small area of ponding in the southeastern section of the site where topography is lowest. Depths are between 0.3 to 0.6m and a velocity of 0.0 to 0.25m/s. In the 1% AEP event there is ponding in the same area but to a slightly greater extent. The maximum depth in this extent is 0.3 to 0.6m and the maximum velocity is 0.5 to 1m/s. The extent of flooding increases greatly in the 0.1% AEP event. A flow path is present as surface water flows from the canal to the River. This event has maximum depths of >1.2m and a velocity of 1 – 2m/s. This has an overall hazard rating of "Danger to Most".
Reservoir	The northern boundary of site SEC1-7, along the River Tame, is at risk of flooding in the event of a failure of Sheepwash Country Park Reservoir in the dry day scenario.
Groundwater	The JBA Groundwater Flood Emergence Mapping (5m resolution) shows the site is at no risk from ground water emergence. The site is deemed to have negligible risk from groundwater flooding due to the nature of the geological deposits. This should be confirmed through additional site investigation work.
Sewers	The site is located within a postcode area with 65 incidences of sewer flooding, according to the Severn Trent Water Hydraulic Sewer Flood Risk Register.

Flood history	The site is not located in or near historic flood outlines in accordance with flood records provided by Sandwell Metropolitan Borough Council and the Environment Agency's Historic Flood Map and Recorded Flood Outline Map datasets.
Flood risk management infrastructure	
Defences	The Environment Agency AIMS dataset shows that there are no formal flood defences at the site, however it is defended by the riverbank.
Residual risk	The site is at residual risk of canal breach or overtopping from the Tame Valley Canal, which is situated approximately 130m south of the site. The northern edge of the site is also at residual risk of reservoir breach in the dry day scenario.
Emergency planning	
Flood warning	The northern boundary of the site is within the Upper Tame (033WAF303) Flood Alert Area, but the area is not within a Flood Warning Area.
Access and egress	Access and egress to the site is currently via Bilport Lane to the east of the site, running under a railway. Access to Bilport Lane is from Holloway Bank (A4196) which runs in both a north and south direction. The access route lies outside of Flood Zone 2 and 3. Access from the north of Holloway Bank is impeded, however the south is unaffected. In the 3.3% AEP surface water event, access is still maintained during the event. Maximum depths are between 0.15 to 0.3m, with a maximum velocity of 0.25 to 0.5m/s. They have a hazard rating of 'Caution'. In the 1% and 0.1% AEP surface water event, access and egress is impeded from Bilport lane. Maximum depths rise to 0.3 to 0.6m and the maximum velocity is 0.5 to 1m/s. The access from Holloway Bank (north) is fully impeded as depths exceed 1.3m and the hazard rating is 'Danger for All'. Access from Holloway Bank (south) is impeded as depths range from 0.3 to 0.6m and the maximum velocity is 1 to 2m/s. The hazard rating is 'Danger for All'. In the design surface water event (the 1% AEP +40%), extents are similar to the 0.1% AEP event and will likely cause similar access and egress issues. The maximum depth along Holloway Bank is 3.2m with a maximum velocity of 4.1 m/s. Extents have a maximum rating of 'Danger for All'. Arrangements for safe access and egress will need to be demonstrated for the 1% AEP plus an allowance for climate change rainfall events, using the depth, velocity, and hazard outputs. Any raising of access routes should not impede surface water flows or contribute to increasing flood risk off-site. If detailed modelling (including consideration of breach scenarios) suggests that the site is at significant risk of flooding which affects access routes, a Flood Warning and Evacuation Plan will be required.
Dry Islands	The site does not become a Dry Island.
Climate change	
Implications for the site	**Management Catchment: Tame, Anker and Mease** Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard, and frequency of both fluvial and surface water flooding **Fluvial Flooding:**

	Fluvial data from the River Tame Model is a 1D-only model. Depth, Hazard and Velocity are not available. Climate change outputs for FZ3a are available, however a proxy was used for FZ3b plus Climate Change. This is represented using a 1.33% AEP event present day model. This is because the 3.3% AEP event plus climate change data is not available. A proxy was thought to be appropriate in this case due to the small proportion of the site at risk of fluvial flooding. This return period was selected by using the available event data. Fluvial peak flow estimates were available for a 50%, 2%, 1.33% and 1% AEP events. 30% (the climate change uplift) was added to the 3.33% and 2% AEP fluvial peak flow estimates. This was then compared to the other available fluvial peak flow estimates for other available return periods. The 1.33% AEP event peak flow estimate was slightly higher than 2% AEP plus climate change. This approach therefore represents a conservative approach to mapping fluvial flood extents plus climate change uplift. Flood extents are shown to increase from the 1.33% AEP (representing Flood Zone 3b plus Climate Change) to Flood Zone 3a + 30% CC. Even so, flooding only occurs along a small section of the northern and eastern boundary. Therefore, fluvial flood risk to the site is not expected to increase significantly with future climate change. Because a proxy for Flood Zone 3b plus Climate change has been used for this study, actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs) for Flood Zone 3b plus climate change (3.33% AEP plus 30%). **Surface Water Flooding:** The design event for rainfall intensities is the upper climate allowance for the 2070s epoch. As such the design event is the 1% AEP + 40% CC. The extent of the design event is similar to that of the present day 0.1% AEP event, with maximum depths of 1.7m. Therefore, pluvial flood risk to the site is not expected to increase significantly with future climate change. Development proposals at the site must address the potential changes associated with climate change and be designed to be safe for the intended lifetime. The provisions for safe access and egress must also address the potential increase in severity and frequency of flooding.
Requirements for drainage control and impact mitigation	

Broad-scale assessment of possible SuDS	**Geology & Soils**
	• The geology consists of:
	  ○ Bedrock formed of mudstone, siltstone, sandstone and coal
	  ○ Superficial deposits consisting of alluvium – clay, silt, sand and gravel.
	• The soil is comprised of slowly permeable, acid loamy and clayey soils with impeded drainage.
	
	SuDS
	• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work.
	• BGS data suggests that the underlying geology is likely to have variable permeability and should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff.
	• The site is not in a Groundwater Source Protection Zone.

	• The site is within the River Trent (source to confluence with Derwent) Nitrate Vulnerability Zone (NVZ) and is within a Secondary A Superficial Aquifer designation zone. As such, infiltration techniques may not be appropriate at the site in order to preserve water quality. • The site is within a Historic Landfill site. A thorough ground investigation will be required as part of a detailed site-specific FRA, to determine potential mitigation for contamination and the impact this may have on SuDS. As such, proposed SuDS should be discussed with the relevant stakeholders (LPA, LLFFA and EA) at an early stage to understand possible constraints. • Surface water discharge rates should not exceed pre-development discharge rates for the site and should be designed to be as close to greenfield runoff rates as reasonably practical in consultation with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques.
Opportunities for wider sustainability benefits and integrated flood risk management	• Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should consider the impacts of future climate change over the projected lifetime of the development • Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will clean and improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. • The Risk of Flooding from Surface Water (RoFSW) mapping indicates the presence of surface water flow paths during the 0.1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.
NPPF and planning implications	
Exception Test requirements	The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied. Whilst part of the site is within Flood Zone 3 and Flood Zone 2, the proposed use is classified as 'Less vulnerable' and the Exception Test is not required for this site.
Requirements and guidance for site-specific Flood Risk Assessment	**Flood Risk Assessment:** Section 2 of the Level 2 SFRA and Sections 2 and 3 of the Level 1 SFRA have more guidance on this section and any relevant policies and information applicable to development within Sandwell. • Consultation with the Sandwell Metropolitan Borough Council, South Staffordshire Water, Severn Trent Water, Canal and River Trust and the Environment Agency should be undertaken at an early stage. • Because the fluvial data for the River Tame is a 1D-only model and a proxy was used for Flood Zone 3b plus Climate Change, more detailed hydraulic modelling of the site is required. This will need to include the latest climate change allowances and 2D outputs with depth, velocity and hazard. • Developers should consult with Severn Trent Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan. • Development plans should use the Level 1 and 2 SFRA for Sandwell, as well as the Local Flood Risk Management Strategies to identify

cumulative flood risk issues. It should also promote an integrated approach to water management. Drainage should be designed and implemented in ways that promote multiple benefits.
- Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Sandwell MBC Local Plan Policies and Sustainable Drainage Design and Evaluation Guide for developers.

Guidance for site design and making development safe:

- The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).
- Development should be steered away from areas at greatest risk, namely along the northern boundary where there is fluvial risk form the River Tame.
- The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are as close as possible to greenfield rates.
- Access and egress is shown to be impeded in the 1% and 0.1% AEP surface water events and careful consideration will need to be given to how safe access/egress can be maintained.
- Consultation with RMAs early on should be implemented to ensure an appropriate flood evacuation plan is put in place for the site.
- Flood resilience and resistance measures should be implemented where appropriate during the construction phase, e.g. raising of floor levels. These measures should be assessed to make sure that flooding is not increased elsewhere. If the floor levels cannot be raised to meet the minimum requirements, developers will need to:
    - raise them as much as possible.
    - consider moving vulnerable uses to upper floors.
    - include extra flood resistance and resilience measures.
- Other examples of flood resistance and resilience measures include:
    - using flood resistant materials that have low permeability to at least 600mm above the estimated flood level.
    - making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level.
    - by raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level.

Key messages

The northern boundary of the site is at risk of fluvial flooding in the present day. Flood extents are similar for fluvial flooding plus climate change, however flooding is also present along a small section of the eastern boundary. More detailed hydraulic modelling of the site is required as the fluvial data for the River Tame is a 1D-only model and a proxy was used for Flood Zone 3b plus Climate Change.

The site is shown to be at risk of pluvial flooding in the 1% AEP and 0.1% AEP event. The site is considered to be at residual risk of canal overtopping or breach. The site is considered 'Less Vulnerable' therefore the Exception Test is not required, however the Sequential Test must still be applied. The development may be able to proceed, considering the following:

- To locate new development in areas of lowest risk, in line with the Sequential Test, by steering sites to Flood Zone 1 and avoiding where possible areas with a high risk of surface water flooding.

- A carefully considered and integrated flood resilient and sustainable drainage design is put forward. A site-specific Surface Water Drainage Strategy, and SuDs maintenance and management plan is submitted along with the FRA.
- There are access and egress issues with the 1% AEP, 0.1% AEP surface water event and the design surface water event (1% AEP plus 40% climate change allowance). Safe access and egress will need to be demonstrated in the 1% AEP fluvial and surface water events including an appropriate allowance for climate change.
- A site-specific Flood Risk Assessment demonstrates that site users will be safe in the design surface water and fluvial events, including an allowance for climate change. This will need to show that the site is not at an increased risk of flooding in the future and that development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties.
- If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another).

Mapping Information

The key datasets used to make planning recommendations for this site were the Environment Agency's Flood Map for Planning and the Environment Agency's Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

Flood Zones	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning mapping.
Climate change	The latest climate change allowances (updated May 2022) have been applied to the EA's RoFSW and River Tame Fluvial dataset.
Fluvial extents mapping	This has been assessed using the present day results from the Environment Agency's River Tame model. The River Tame fluvial model is a 1D model only. Depth, Velocity and Hazard data are not available. Actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs).
Surface Water	The Agency's Risk of Flooding from Surface Water (RoFSW) map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	The Environment Agency's Risk of Flooding from Surface Water (RoFSW) has been used to define areas at risk from surface water flooding.