East Devon District Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**Farr_01**
Address	Land south of the A30, Exeter
Area	0.9 hectares
Current land use	Agricultural storage sheds
Proposed land use	Employment allocation
Flood Risk Vulnerability	Less vulnerable
Sources of flood risk	
Location of site	The site is located south of Exeter Airport, south of the A30 and north of the B3184. The site is located adjacent to a small ditch/watercourse to the east of the site, which flows under the A30 and heads north across Exeter Airport. Furthermore, a small unnamed tributary of the River Clyst flows approximately 100m west of the site.
Topography	The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography of the site declines from the west (35mAOD) to east (30.5mAOD). The gradient is approximately 2%, therefore the site is considered to have little slope, and is unlikely to affect any proposed SuDS features. The catchment drains north along an unnamed watercourse before joining the River Clyst.
Existing drainage features	No existing drainage features have been identified on site, with the exception of the watercourse/ditches to the west and east of the site. The extent and location of the culvert downstream is unknown and should be assessed as part of a site-specific FRA.
Fluvial	The proposed development site has not been identified to be in an area at risk of fluvial flooding.
Fluvial plus climate change	The proposed development site has not been identified to be in an area at risk of fluvial flooding.
Surface Water	**Available data and mapping:** Environment Agency's Risk of Flooding from Surface Water dataset for the 3.33%, 1% and 0.1% AEP events. Farr_01 - Surface Water 3.33% AEP – Depth Farr_01 - Surface Water 3.33% AEP – Hazard Farr_01 - Surface Water 3.33% AEP - Velocity Farr_01 - Surface Water 1% AEP – Depth Farr_01 - Surface Water 1% AEP – Hazard Farr_01 - Surface Water 1% AEP - Velocity Farr_01 - Surface Water 0.1% AEP – Depth Farr_01 - Surface Water 0.1% AEP – Hazard Farr_01 - Surface Water 0.1% AEP - Velocity

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Data analysis:

3.3% AEP (1 in 30 year) event:

Proportion - 0%

Max Depth – N/A	Mean Depth – N/A
Max Velocity – N/A	Mean Velocity – N/A
Max Hazard – N/A	Mean Hazard – N/A

1% AEP (1 in 100 year) event:

Proportion - 1%

Max Depth – 0.56m	Mean Depth – 0.28m
Max Velocity – 0.18m/s	Mean Velocity – 0.10m/s
Max Hazard – 1.28	Mean Hazard – 0.89

0.1% AEP (1 in 1000 year) event:

Proportion - 11%

Max Depth – 1.20m	Mean Depth – 0.33m
Max Velocity – 1.11m/s	Mean Velocity – 0.17m/s
Max Hazard – 1.61	Mean Hazard – 0.98

Flood characteristics: The site is not shown to be at risk of flooding in the 3.33% AEP event, with 1% of the site at risk of flooding in the 1% AEP event. The average flood depth in the 1% AEP event is shown to be 0.28m. During the 1% and 0.1% AEP events two localised areas flood in the east and northwest of the site, with flood extents increasing in the 0.1% AEP event, with predominantly shallow depths (averaging 0.33m in the 0.1% AEP event). The average hazard and velocity on site during the 0.1% AEP event are shown to be 0.98 'danger to some' and 0.17m/s respectively.

Surface water plus climate change

Available data and mapping: Environment Agency's Risk of Flooding from Surface Water dataset for the 3.33%, 1% and 0.1% AEP events with 65% Climate Change scenarios.

Farr_01 - Surface Water 3.33% AEP plus 65% Climate Change – Depth
Farr_01 - Surface Water 3.33% AEP plus 65% Climate Change – Hazard
Farr_01 - Surface Water 3.33% AEP plus 65% Climate Change - Velocity
Farr_01 - Surface Water 1% AEP plus 65% Climate Change – Depth
Farr_01 - Surface Water 1% AEP plus 65% Climate Change – Hazard
Farr_01 - Surface Water 1% AEP plus 65% Climate Change - Velocity
Farr_01 - Surface Water 0.1% AEP plus 65% Climate Change – Depth
Farr_01 - Surface Water 0.1% AEP plus 65% Climate Change – Hazard
Farr_01 - Surface Water 0.1% AEP plus 65% Climate Change - Velocity

Management Catchment: Farr_01 is located within the East Devon Management Catchment. The Environment Agency guidance recommends that the Upper End allowance is considered for both the 3.3% and 1% AEPs for the 2070's epoch, unless the allowance for the 2050's epoch is higher, in which case this should be used. This is appropriate for development with a lifetime beyond 2100. The recommended uplift on peak rainfall intensity for the 3.3% AEP is 40% and for the 1% AEP is 45%. As Risk of Flooding from Surface Water data with a 65% uplift was already available this has been used as the best available data for the 3.3%, 1% and 0.1% AEPs.

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Site Code	**Farr_01**
Address	Land south of the A30, Exeter
	Data analysis: **3.3% AEP (1 in 30 year) plus 65% climate change event:** Proportion - 4% Max Depth – 0.94m Max Velocity – 0.36m/s Max Hazard – 1.48 Mean Depth – 0.25m Mean Velocity – 0.1m/s Mean Hazard – 0.77 **1% AEP (1 in 100 year) plus 65% climate change event:** Proportion - 11% Max Depth – 1.20m Max Velocity – 0.52m/s Max Hazard – 1.61 Mean Depth – 0.33m Mean Velocity – 0.12m/s Mean Hazard – 0.98 **0.1% AEP (1 in 1000 year) plus 65% climate change event:** Proportion - 24% Max Depth – 1.86m Max Velocity – 1.06m/s Max Hazard – 1.98 Mean Depth – 0.61m Mean Velocity – 0.22m/s Mean Hazard – 1.18 **Flood characteristics:** The site is shown to be at risk of flooding in all three scenarios with two localised areas of flooding in the east and northwest of the site, with depths averaging less than 0.61m. The maximum flood depth in the 0.1% AEP plus 65% climate change event is shown to be 1.86m in the eastern boundary of the site. The average velocity is shown to be no more than 0.22m/s, with a maximum velocity of 1.06m/s during the 0.1% AEP event with 65% climate change. The average hazard rating is 1.18 and is therefore stated to be a 'danger to some'.
Reservoir	The site is not located near to a Wet or Dry day reservoir flooding extent, according to the Environment Agency's reservoir flood mapping.
Groundwater	**Available data and mapping:** The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid. Farr 01 - Groundwater Emergence **Flood characteristics:** Groundwater levels on site are shown to be 'low risk'.
Sewers	No evidence of sewer flooding has been identified at or near the development site.
Flood history	The site is not shown to be located within the Environment Agency's Recorded Flood Outlines extent. There are no flooding incidents within Devon County Council's dataset recorded within 100m of the site.
Policy zones	
Critical drainage areas	The site has not been identified to be located within a critical drainage area. Mapping: Farr 01 - Critical Drainage Area

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Coastal change management areas	The site is not located within a coastal change management area.
Flood risk management infrastructure	
Existing defences	The Environment Agency's AIMS dataset shows there are no formal flood defences within the vicinity of the site.
Emergency planning	
Flood warning	The site has not been identified to be located within an area of flood warning or alerts. Mapping: Farr 01 - Flood Warnings and Alerts
Access and egress	Access and egress are available heading west of the site along the B3184 and are flood free in the 1% AEP plus climate change surface water modelling.
Requirements for drainage control and impact mitigation	
Broad-scale assessment of possible SuDS	**Geology and Soils** The geology consists of mudstone, siltstone and sandstone. There are no superficial deposits at the development site. The soils are shown to be slightly acid loamy and clayey soils with impeded drainage to the west and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils to the east. This suggests that infiltration may be a viable means of surface water disposal. **SuDS** • The site is located within a Nitrate Vulnerable Zone. Therefore, early engagement with the LLFA and the EA is recommended to determine requirements for the site to manage the impact to surrounding watercourses. Consideration of water quality is likely to be of high importance and demonstrated through the use of the Simple Index Approach. • The site has not been identified to be located within a historic landfill site or a groundwater Source Protection Zone. • Groundwater levels on site suggest low risk, however soils suggest impeded drainage to the west of the site. The infiltration potential of the site should be confirmed through infiltration testing, in line with BRE 365. Offsite discharge may therefore be required to discharge surface water runoff. • 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. • SuDS measures should follow the discharge hierarchy, and if it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be

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	confirmed through surveys and the discharge rate agreed with the asset owner. • Due to the topography, any surface water not intercepted via infiltration will drain via gravity to the eastern boundary. It is therefore recommended that the LLFA and the EA are consulted about viable discharge locations for surface water from the site and their attenuation potential.
Opportunities for wider sustainability benefits and integrated flood risk management	• Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity, helping meet requirements for the Nitrate Vulnerable Zone. This could provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. • The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. • SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual. • SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements. • 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 improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered. Conveyance features should be located on common land or public open space to facilitate ease of access. • SuDS should be designed in line with Devon County Councils SuDS Guidance. https://www.devon.gov.uk/floodriskmanagement/document/sustainable-drainage-system-guidance-for-devon-2023/#dcc-documents-cpt-contents
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. The NPPF classifies the usage as "Less Vulnerable".

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(Local Authority considerations)	East Devon District Council require that developments in areas at risk of surface water, groundwater or reservoir flooding will be expected to follow the same requirements as those laid out in Parts (a) and (b) of the NPPF's Exception Test. Given the site is in Flood Zone 1, and the limited surface water extent in the 0.1% AEP event, provided development is proposed outside of the areas at risk, the Exception Test is not required for this site.
Requirements and guidance for site-specific Flood Risk Assessment **(Developer considerations)**	**Flood Risk Assessment:** The Level 1 SFRA has more guidance on this section and any relevant policies and information applicable to development within East Devon District Council. • Consultation with the East Devon District Council, and where relevant South West Water, Devon County Council, and the Environment Agency should be undertaken at an early stage. • Developers should consult with South West 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 East Devon District Council, 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. • The site is located within a medium risk Cumulative Impact Assessment (CIA) catchment and therefore specific CIA policy documents are applicable to this site. **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). • 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 do not exceed greenfield rates. • Arrangements for safe access and egress are likely to be possible, however these will need to be considered further within a site-specific FRA for the surface water events with an appropriate allowance for climate change, using the depth, velocity, and hazard outputs.

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Key messages

The site is generally identified to be at low risk, and development is likely to progress if:

- A site-specific FRA is undertaken to assess the risk of surface water flooding in relation to the proposed development.
- Development is placed outside of the areas at risk from surface water flooding.
- Infiltration rates are assessed on site as part of a drainage strategy.
- There is early engagement with the LLFA and the EA on the proposed SuDS measures and infiltration rate to discuss requirements on the site meeting relevant conditions due to the sites location within a Nitrate Vulnerable Zone.
- Cumulative Impact Assessment policy documents must be understood, and the cumulative impact of development should be considered.