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

Site Code	**Coly_06**
Address	Land east of the B3161, Colyton
Area	1.1 hectares
Current land use	Greenfield
Proposed land use	Housing and mixed use
Flood Risk Vulnerability	More vulnerable
Sources of flood risk	
Location of site	The site is located to the east of the B3161 and southeast of Govers Meadow. The site is approximately 150m west of the River Coly, which flows in a southerly direction.
Topography	The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography of the site declines from the west (16.1mAOD) to the east (10.4mAOD), with a relatively continuous gradient. The gradient is approximately 6%, therefore the site is considered to have a gentle slope, and there is potential some ground alterations may be required to accommodate any proposed SuDS features. The site therefore drains east into the River Coly.
Existing drainage features	The site has been identified to drain east into the River Coly, however some runoff may drain into an unnamed tributary to the north of the site. Further investigation of existing drainage and highway connections should be undertaken by the developer as part of a site-specific FRA to identify the risk to the site and associated flow paths.
Fluvial	**Available data and mapping:** Environment Agency Flood Map for Planning for Rivers and Sea. **Data analysis:** Details of the sites location within each Flood Zone are provided within the SFRA Site Screening Appendix. **Flood characteristics:** The site is almost completely located within Flood Zone 2, with the eastern half of the site located within Flood Zone 3. A small area to the west of the site is located within Flood Zone 1. • Flood Zone 1 represents areas which have less than 1 in 1000 (0.1%) chance of river flooding in a given year. • Flood Zone 2 represents areas which have less than 1 in 100 (1%) but greater than 1 in 1000 (0.1%) chance of river flooding in a given year. • Flood Zone 3 representing an area greater than 1 in 100 (1%) chance of river flooding in a given year. It should be noted that the Flood Zone 2 extent on site is comprised of the National Generalised Fluvial Model and the Environment Agency's Historic Flood Map dataset. The Historic Flood Map extent is much larger than the Generalised model extent, extending a further 33m west across the site, where there is a 2.8m elevation increase from the Generalised modelling extent. The Generalised modelling for Flood Zone 3 and 2 is similar in extent which corresponds with the relatively steep topography on site, suggesting Flood Zone 2's historical extent is likely to be inaccurate. The topography on site shows a 6m change in elevation from west to east, highlighting that it is

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	extremely unlikely this this depth of flooding would occur on site across the Flood Zone 2 extent. It is therefore likely that Flood Zone 2 is not a fair representation of the Flood Zones on site and development can proceed within Flood Zone 2, avoiding Flood Zone 3 to the east. As there is no detailed modelling available for this site, Flood Zone 3a has been used as a proxy for Flood Zone 3b. Detailed modelling should be undertaken as part of a detailed site-specific Flood Risk Assessment to define the extent of Flood Zone 3b and confirm the extent of Flood Zone 3a and Flood Zone 2. In the absence of detailed modelling, the Risk of Flooding from Surface Water dataset has been used to assess the depth, hazard and velocity flood risk to the site. Consideration should still be given to the Flood Zones and detailed modelling may be required within a site specific assessment.
Fluvial plus climate change	In the absence of detailed modelling, the Risk of Flooding from Surface Water dataset has been used to assess the depth, hazard and velocity flood risk to the site. Consideration should still be given to the Flood Zones and detailed modelling may be required within a site specific assessment.
Surface Water	**Available data and mapping:** Environment Agency's Risk of Flooding from Surface Water dataset for the 3.3%, 1% and 0.1% AEP events. Coly_06 - Surface Water 3.33% AEP – Depth Coly_06 - Surface Water 3.33% AEP – Hazard Coly_06 - Surface Water 3.33% AEP - Velocity Coly_06 - Surface Water 1% AEP – Depth Coly_06 - Surface Water 1% AEP – Hazard Coly_06 - Surface Water 1% AEP - Velocity Coly_06 - Surface Water 0.1% AEP – Depth Coly_06 - Surface Water 0.1% AEP – Hazard Coly_06 - Surface Water 0.1% AEP - Velocity **Data analysis:** **3.3% AEP (1 in 30 year) event:** Proportion - <1% Max Depth – 0.29m; Mean Depth – 0.21m Max Velocity – 0.18m/s; Mean Velocity – 0.1m/s Max Hazard – 0.96; Mean Hazard – 0.71 **1% AEP (1 in 100 year) event:** Proportion - 1% Max Depth – 0.36m; Mean Depth – 0.12m Max Velocity – 0.6m/s; Mean Velocity – 0.38m/s Max Hazard – 1.19; Mean Hazard – 0.63 **0.1% AEP (1 in 1000 year) event:** Proportion - 17% Max Depth – 0.46m; Mean Depth – 0.12m Max Velocity – 1.58m/s; Mean Velocity – 0.7m/s Max Hazard – 1.29; Mean Hazard – 0.65

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	Flood characteristics: During the 3.3% AEP event less than 1% of the site is shown to be at risk of flooding in the northeastern corner with a maximum depth of 0.29m. Within the 1% AEP event, a flow path forms from the centre of the site out to the east, increasing in extent out to the west during the 0.1% AEP event. It is therefore evident that as the flooding extent increases, the average flood depth decreases. The mean depth, velocity and hazard within the 0.1% AEP event are shown to be 0.12m, 0.7m/s and 0.65 (a 'caution') respectively.
Surface water plus climate change	**Available data and mapping:** Environment Agency's Risk of Flooding from Surface Water dataset for the 3.3%, 1% and 0.1% AEP events with 65% Climate Change scenarios. Coly_06 - Surface Water 3.33% AEP plus 65% Climate Change – Depth Coly_06 - Surface Water 3.33% AEP plus 65% Climate Change – Hazard Coly_06 - Surface Water 3.33% AEP plus 65% Climate Change - Velocity Coly_06 - Surface Water 1% AEP plus 65% Climate Change – Depth Coly_06 - Surface Water 1% AEP plus 65% Climate Change – Hazard Coly_06 - Surface Water 1% AEP plus 65% Climate Change - Velocity Coly_06 - Surface Water 0.1% AEP plus 65% Climate Change – Depth Coly_06 - Surface Water 0.1% AEP plus 65% Climate Change – Hazard Coly_06 - Surface Water 0.1% AEP plus 65% Climate Change - Velocity **Management Catchment:** Coly_06 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. **Data analysis:** **3.3% AEP (1 in 30 year) plus 65% climate change event:** Proportion - 5% Max Depth – 0.43m / Mean Depth – 0.11m Max Velocity – 0.96m/s / Mean Velocity – 0.55m/s Max Hazard – 1.24 / Mean Hazard – 0.61 **1% AEP (1 in 100 year) plus 65% climate change event:** Proportion - 16% Max Depth – 0.49m / Mean Depth – 0.12m Max Velocity – 1.54m/s / Mean Velocity – 0.65m/s Max Hazard – 1.33 / Mean Hazard – 0.64 **0.1% AEP (1 in 1000 year) plus 65% climate change event:** Proportion - 56% Max Depth – 0.82m / Mean Depth – 0.28m Max Velocity – 2.07m/s / Mean Velocity – 0.87m/s Max Hazard – 2.1 / Mean Hazard – 1.08

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	Flood characteristics: The site is shown to be at risk of flooding in all three scenarios to the north and east of the site with the extent increasing west in the 0.1% AEP plus 65% climate change up to 56% site coverage. The mean depth also increases to 0.28m. The average velocity is shown to be 0.87m/s, with a maximum of 2.07m/s. The average hazard rating is shown to be a 'danger to some' at 1.08.	
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. Coly_06 - Groundwater Emergence **Flood characteristics:** Groundwater levels on site vary, reflecting a banded pattern of four relatively equal width bands. During a 1% AEP groundwater flood event, groundwater levels from west to east are shown to be: 1. Between 0.5m and 5m below the ground surface. 2. Between 0.025m and 0.5m below the ground surface. 3. Either at or very near (within 0.025m of) the ground surface. 4. Low risk. Flow paths would be expected to follow the topography of the site and be similar to surface water flow paths. The risk of groundwater flooding will require further consideration in a site-specific flood risk assessment.	
Sewers	The site has been identified to be located near to a previous hydraulic overload event from November/December 2012, as reported within East Devon's Historical hydraulic flooding incidents database.	
Flood history	**Available data and mapping:** Environment Agency's Recorded Flood Outlines. **Flood characteristics:** Nearly all of the site is shown to be located within the Environment Agency's Recorded Flood Outlines extent. These events are all due to the Rivers Axe, Sid and Coly exceeding capacity in 1960 and 1968. 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: Coly_06 - Critical Drainage Area	
Coastal change management areas	The site has not been identified to be located within a coastal change management area.	

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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 majority of the site has been identified to be located within an area of flood alerts for the River Axe area for the Rivers Axe, Coly, Yarty, Umborne Brook and coastal streams from Branscombe to Axmouth. This area of the site is also within the River Coly from Colyton to Colyford flood warning area. Mapping: Coly_06 - Flood Warnings and Alerts
Access and egress	Access and egress is shown to be largely unaffected during all assessed events, with depths of up to 0.32m in a small, localised area on the B3161 to the west of the site shown 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, with clay, silt and sand superficial deposits. The soils are shown to be loamy and clayey floodplain soils with naturally high groundwater across the majority of the site, with slightly acid loamy and clayey soils with impeded drainage to the west. This suggests that infiltration is unlikely to be a viable means of surface water disposal. The infiltration potential of the site should be confirmed through infiltration testing, in line with BRE 365. **SuDS** • The site has not been identified to be located within a historic landfill site, a groundwater Source Protection Zone or Nitrate Vulnerable Zone. • Groundwater levels on site are close to the grounds surface, and therefore infiltration on site is unlikely. 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 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 southeastern corner. It is therefore

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	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. This could also 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, 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 **(Local Authority considerations)**	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 "More Vulnerable"; this type is taken into consideration for the Exception Test. The site is predominantly located within Flood Zone 2 and 3, with a limited surface water extent in the 0.1% AEP. It is however suggested that development is proposed within Flood Zone 1 and 2 on site, due to the steep topography highlighting the potential inaccuracies of the historical data within

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	the Flood Zone 2 extent. The Exception Test will be required for this site and it is also likely detailed flood modelling may be required during a site-specific FRA.
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.

Key messages

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

- A site-specific FRA is undertaken to assess the risk of fluvial, groundwater and surface water flooding in relation to the proposed development, and the access and egress arrangements.
- Development is placed outside of the areas at risk from surface water flooding and outside of Flood Zone 3 of the Flood Map for Planning, towards the west of the site where elevation is higher. Should development be proposed within areas at risk or within Flood

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Zone 3 detailed flood modelling should be undertaken within a site-specific FRA. Any development within Flood Zone 3 should be allocated as an undeveloped open space corridor, and not as gardens, car parking or other features associated with individual plots. It should also be noted that the site should not discharge surface water into combined sewer.

- Infiltration rates are assessed on site as part of a drainage strategy.
- Further investigation of existing drainage and highway connections should be undertaken to identify the risk to the site and associated flow paths.
- The Exception Test is satisfied and detailed modelling is undertaken on site as part of a site-specific FRA.
- Cumulative Impact Assessment policy documents must be understood, and the cumulative impact of development should be considered.