King's Lynn and West Norfolk Borough Strategic Flood Risk Assessment Level 2 Community Level Guidance Tables

Completed by	JBA consulting
Date	March 2019
Author	Freyja Scarborough
Reviewer / Sign-off	Hannah Coogan
Version Number	Version 3.0

Level 2 Community Level Guidance Tables

Community details	**Community**	Clenchwarton			
	Flood Risk Summary	Highest risk flooding mechanism	Tidal / Coastal		
		Most likely source of flooding	Surface Water		
Sources of flood risk	**Existing drainage features**	• The West Lynn Drain flows in close proximity to the southern boundary of the settlement. • Other small drains surround the settlement to the west and east. • There are small areas of open drain identified within the northern settlement boundary			
	Fluvial	No fluvial flood zone present			
	Tidal	All of community contained within tidal Flood Zone 3a.			
	Surface Water	Small impact from 3.3% AEP event. More significant impact in 1% and 0.1% AEP events.			
	Residual Risk	Community would be inundated in a tidal breach scenario.			
	IDB watercourse present?	This community is completely covered by the King's Lynn Internal Drainage Board (IDB), in the admin area of the Water Management Alliance (WMA). The drains near the community are: • Linford Close Drain • Margaretta Drain • Willow Farm Drain • Linford Estate Drain			
	Flood history	• There are limited records of historical flooding in the Environment Agency recorded flood outlines, provided Section 19 reports and internet searches. • There is one recorded instance of sewer flooding from March 2017			
Flood risk management infrastructure	**Defences**	**Defence Type**	**Flooding Type**	**Standard of Protection**	**Condition**
		Embankment	Tidal	200	2 – (Good)
		Embankment	Tidal	200	3 – (Fair)
		The community is shown as an Area Benefitting from Defences			
Opportunities for sustainable development	**Asset management**	No EA pipeline schemes at or near this community.			
	Capital investment policy and regeneration	No current schemes identified for this community.			

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	Higher level policy	• The PFRA, 2011 identifies Clenchwarton as having approximately 200 or more people at risk of flooding. • The Great Ouse Flood Risk Management Plan, 2011 policy for this area is: 'Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change'. • The Clenchwarton community is designated as low-lying fenland in the hinterland of the Wash Shoreline Management Plan (SMP) 2 and is protected by defences along the wash coastline and is therefore relevant to the SMP. The policy within this area (PDZ1) is to maintain the current defences into the future, considering an 'envelope of potential developments' for all future scenarios. • The Water Cycle Study, 2009 highlights that although the area is at high risk of tidal flooding, it is important to account for the presence of defences when assessing this area.	
Emergency planning	**Flood warning**	• Covered by the 'Wash frontage at Admiralty Point including the Tidal River Great Ouse west bank breach to Eau Brink' Flood Warning Area. • Covered by the 'King's Lynn, West Lynn and The Wash frontage' Flood Alert Area	
	Access and egress	• Possible in the 5% AEP fluvial and tidal events but not possible in any part of the settlement in higher AEP events. • Likely to be possible with difficulty in the 3.3% and 1% AEP surface water events. Likely not to be possible in the 1% AEP surface water event.	
Climate Change	**Implications for the community**	• There is a small increase in the impact of surface water when taking into account the future effects of climate change. • Climate change modelling does not show any impact to the defended tidal scenario (which assumes no breach occurs). However, it may have a significant impact on the frequency and severity of storm surges which have not been modelled for the SFRA.	
Requirements for drainage control and impact mitigation	**Broad scale assessment of possible SuDS**	**Bedrock Geology**	Tidal Flat Deposits - Clay and Silt
		Superficial Geology	Kimmeridge Clay Formation - Mudstone
		Soil Type	Naturally wet
		Groundwater Source Protection Zone	No
		Historic Landfill Site	No

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		• Areas Susceptible to Groundwater Flooding data is not available for this community, as such the potential of broadscale assessment is limited and the suitability of SuDS will need to be determined by on-site investigations. • Source control techniques are likely to be suitable for this community. • Infiltration techniques will be unlikely to be suitable owing to the naturally wet soils. • Detention features may be feasible providing site slopes are <5% at the location of the detention feature. If the site has groundwater issues, then a liner will be required. • Filtration systems are probably unsuitable providing owing to the high depth of the groundwater table.	
NPPF and planning implications	**Existing Local Considerations**	• Clenchwarton is entirely within an area benefiting from tidal flood defences along the River Great Ouse. Developers should liaise with the Environment Agency and consider whether a financial contribution towards the long-term maintenance and/ or upgrade of the defences would be appropriate to help safeguard against increasing flood risk over the lifetime of the development. • This is especially relevant as the large defence embankment protecting Clenchwarton is identified as asset condition 3 meaning it contains defects that could reduce the performance of the asset. • The Sustainability Appraisal, 2015 identifies Clenchwarton as a Key rural service centre with the potential to accommodate growth to sustain the wider rural community with a greater amount of development due to the range of services available. • The Site Allocations and Development Management Policies Plan, 2016 highlights that appropriate site mitigation measures will be required as the entire community falls within the highest flood risk area. • The Site Allocations and Development Management Policies Plan, 2016 Policy G25.1 Clenchwarton – Land between Wildfields Road and Hall Road allocates an area of 0.7ha to the south of Wildfields Road for at least 10 residential dwellings. Submission of a Flood Risk Assessment (FRA) that should address all forms of flood risk (Tidal, fluvial, pluvial and groundwater). The Flood Risk Assessment (FRA) should explain how surface water drainage will be managed. The FRA must demonstrate how the development would provide wider sustainability benefits to the community that outweigh the risk associated with flooding and that the development would be safe for its lifetime without increasing flood risk elsewhere and, where possible, would reduce flood risk overall. The FRA should also suggest appropriate mitigation (flood resilience measures).	

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	Requirements and guidance for site-specific Flood Risk Assessment	• Early consultation with WMA is strongly recommended in this area. • Safe access and egress will need to be demonstrated taking into account the impacts of surface water flooding and the additional impact of climate change. An FRA should also suggest appropriate mitigation (flood resilience measures). • Areas Susceptible to Groundwater Flooding data availability was limited for this community, as such the potential of broadscale assessment is limited and the suitability of SuDS will need to be determined by on-site investigations. Any SuDS measures should be applied using the guidance provided by the Lead Local Flood Authority. • Consider the impact of a tidal breach by sequentially placing the highest vulnerability part of the development in the areas of lowest flood risk, applying the Councils Flood Risk Design Guidance and creating a site-specific emergency plan for flood events. • Detailed hydraulic modelling will need to consider any drains within and surrounding the settlement that are likely to affect the site to assess fluvial flood risk in the community (including IDB drains). Hydraulic modelling should also seek to understand the impact of residual risk from culvert blockage to any proposed sites where there may be a risk. • The FRA should address all forms of flood risk (tidal, surface water and groundwater). • Should explain how surface water drainage will be managed. • The FRA must demonstrate how the development would provide wider sustainability benefits to the community that outweigh the risk associated with flooding and that the development would be safe for its lifetime without increasing flood risk elsewhere and, where possible, would reduce flood risk overall.	
Conclusions and		Tidal and Coastal	Fluvial / Surface Water
		0.5% AEP and Breach	None / 3.3% AEP

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recommendations		• Clenchwarton is entirely within an area benefiting from tidal flood defences along the River Great Ouse. • Consider contributions to the River Great Ouse tidal defences protecting the settlement. • Completely contained in Flood Zone 3a. • The Sustainability Appraisal, 2015 highlights that appropriate site mitigation measures will be required as the entire settlement falls within the highest flood risk area. • Limited records of historical flooding. • Climate change will increase the risk from tidal flooding • Consider the impacts of tidal breach. • in a major tidal event the community could be completely cut off and emergency planning implications for new development are critical • Early consultation with WMA is strongly recommended in this area.	
Mapping Information			
Flood Zones		All Flood Zone information has been compiled from the outputs of The Wash, 2018 tidal model	