

4. Climate change adaptation

Context

National

4.1 Key messages from the National Planning Policy Framework (NPPF) include:

- Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.
- Inappropriate development in areas at high risk of flooding should be avoided by directing development away from areas of highest risk (whether existing or future).
- Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources.
- Plans should take account of the effects of climate change in the long term, taking into account a range of factors including flooding. Adopt proactive strategies to adaptation and manage risks through adaptation measures including well planned green infrastructure.
- Plans should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbate the impacts of physical changes to the coast.

4.2 The UK Climate Change Risk Assessment is published on a 5-yearly cycle in accordance with the requirements of the Climate Change Act 2008. It required the Government to compile an assessment of the risks for the UK arising from climate change, and then to develop an adaptation programme to address those risks and deliver resilience to climate change on the ground. For both the 2012 and the 2017 UK Climate Change Risk Assessment, the Adaptation Sub-Committee commissioned an evidence report ¹⁰ containing six priority risk areas requiring additional action in the next five years:

- Flooding and coastal change risks to communities, businesses and infrastructure;
- Risks to health, well-being and productivity from high temperatures;
- Risk of shortages in the public water supply, and for agriculture, energy generation and industry;
- Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity;
- Risks to domestic and international food production and trade; and
- New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals

4.3 The Flood and Water Management Act (2010)¹¹ sets out measures to ensure that risk from all sources of flooding, not just rivers and seas, are managed more effectively. This includes: incorporating greater resilience measures into the design of new buildings; utilising the environment in order to reduce flooding; identifying areas suitable for inundation and water storage to reduce the risk of flooding elsewhere; roll back development in coastal areas to avoid damage from flooding or coastal erosion; and creating sustainable drainage systems (SuDS).

¹⁰ DEFRA (2017): 'UK Climate Change Risk Assessment Report January 2017', [online] available to download from: <<https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2017>> [last accessed 13/02/18]

¹¹ Flood and Water Management Act (2010) [online] available at: <http://www.legislation.gov.uk/ukpga/2010/29/contents>
Accessed Aug 2017

- 4.4 The Committee of Climate Change published a 2012 report entitled 'How Local Authorities can Reduce Emissions and Manage Climate Change Risk'¹² which emphasises the crucial role councils have in helping the UK meet its carbon targets and preparing for the impacts of climate change. It outlines specific opportunities for reducing emissions and highlights good practice examples from a number of local authorities.

Regional

- 4.5 The North West England and North Wales Shoreline Management Plan SMP2 (2012) identifies sustainable long-term policies to protect coastal communities and environments through a range of measures and strategies ranging from actively intervening to protect built up areas to managing the natural erosion and change to coastlines in less populated areas. The SMP notes that the Borough's coastal location makes it vulnerable to flooding, though its extensive areas of sand dunes and sandy foreshore offer a degree of natural protection to settlements on the northern coastline, supplemented by extensive manmade defences spanning the whole north coast frontage.

Local

- 4.6 The Wirral Strategic Flood Risk Assessment (SFRA) (2009)¹³ is a Level 1, or basic, SFRA. It provides a strategic overview of areas of risk and potential mitigations in the Borough, without descending to site specific exception and sequential testing. A replacement Level 1 SFRA is nearing completion and is expected to be published in spring 2019.
- 4.7 Wirral Preliminary Flood Risk Assessment Report (2011) provides an assessment of local flood risk across the Borough, including information on past floods and the potential consequences of future flood events. The study was updated via Addendum in 2017.
- 4.8 The Wirral Local Flood Risk Management Strategy (2016)¹⁴ supplements the SMP by identifying how the strategic SMP policies might be best implemented locally. The Strategy splits the Borough into 14 'Strategy units' for the purposes of policy implementation.

Baseline

Current baseline

- 4.9 The Borough's coastal location and low lying landform make it potentially vulnerable to flooding, from rivers (the Birket, Fender and Dibbin and their tributaries) the sea (mainly along the north Wirral coast). Much of the low-lying areas of north Wirral fall within Flood Zone 3. The majority of the non-coastal areas of the Borough are in the lowest risk Flood Zone 1. In addition, however, surface water flooding can occur almost anywhere whenever short intense rainfall exceeds the capacity of the ground and the local drainage network to absorb it. This type of flooding is often localised and difficult to predict in advance. It can occur well away from existing watercourses and it can be exacerbated by local topography, impermeable ground. Fluvial and surface water flood risk is mapped in Figures 4.1 and 4.2 respectively.
- 4.10 The 2017 Preliminary Flood Risk Assessment Addendum which identifies six significant flood events in the Borough between 2012 and 2017¹⁵:
- 13th August 2012
 - 15th August 2012
 - 29th August 2012

¹² CCC (2012), 'How local authorities can reduce emissions and manage climate risks', [online]; available from:

<https://www.theccc.org.uk/publication/how-local-authorities-can-reduce-emissions-and-manage-climate-risks/>

¹³ Fauber Mansell (2009) Wirral Strategic Flood Risk Assessment [online], available from: <https://geosmartinfo.co.uk/wp-content/uploads/sfra/WSFRA-Final-Report.pdf>

¹⁴ Wirral Metropolitan Borough Council (2016) Flood Risk Management Strategy [online], available from:

<https://www.wirral.gov.uk/sites/default/files/all/communities%20and%20neighbourhoods/Wirral%20Local%20Flood%20Risk%20Management%20Strategy.pdf>

¹⁵ Wirral Metropolitan Borough Council (2017) Preliminary Flood Risk Addendum [online], available from:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/698416/PFRA_Wirral_Metropolitan_Borough_Council_2017.pdf

- 24th September 2012
- 5th December 2013
- August and September 2015

The flooding resulted from a combination of factors, including overtopping of coastal defences; and insufficient capacity within the public sewerage, the highway or land drainage systems to deal with what were sometimes extreme events.

- 4.11 The 2009 SFRA draws the following conclusion in relation to key areas of flood risk in the Borough:

"The main flood risk locations on Wirral are at Leasowe (fluvial and potential tidal flood risk), Greasby (fluvial and surface water / sewer) and Birkenhead Docks. With regard to Birkenhead Docks ... there is significant fluvial flood risk from the outfall of The Birkett through the dock system. This issue warrants further analysis given the strategic importance of this location for development on Wirral".

In this context it will be important that strategic development at Wirral Waters is taken forward with flood risk management a key priority.

- 4.12 The Environment Agency maintains 97km of main rivers and any associated flood defences within the Wirral catchment: These are listed below:

- Arrowe Brook
- The Birket
- Birket Old Courses
- Carr Drain
- Clatter Brook
- Dibbinsdale Brook
- Dibbinsdale Brook Tributary
- River Fender
- Greasby Brook
- Newton Brook
- Perimeter Drain
- Prenton Brook

- 4.13 The Wirral Local Flood Risk Management Strategy references the network of ordinary watercourses for which Wirral Council is the relevant operating authority. There are 5.04km of 'critical ordinary watercourses' of which 3.89km are culverted (piped) and, although these are non-main river, they are considered critical due to their potential to put large numbers of people and property at risk of flooding should they not be maintained appropriately.

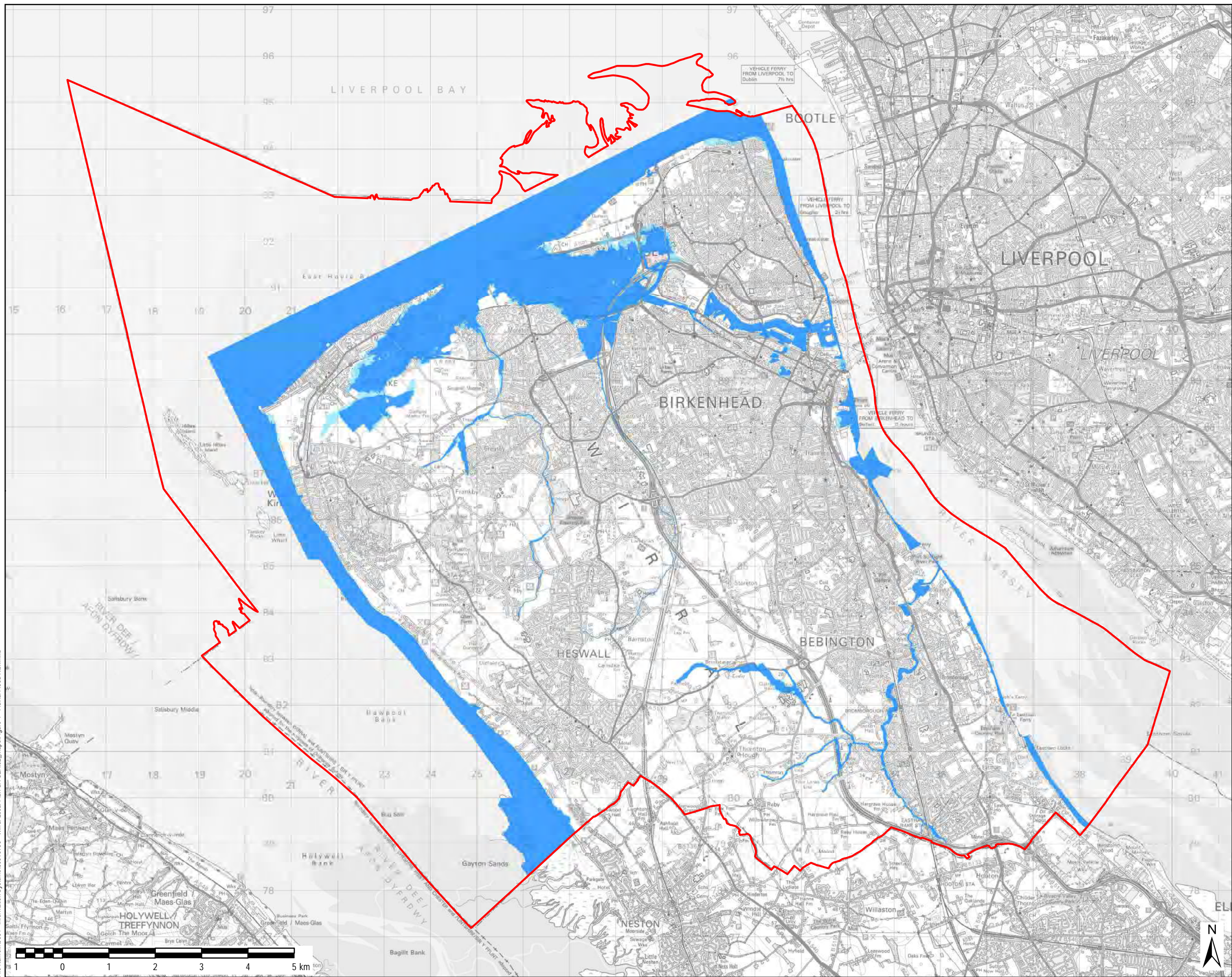
- 4.14 The Shoreline Management Plan splits the Borough into 14 'strategy units' for the purposes of identifying where intervention is most needed to maintain existing flood defence protection. The Wirral Coastal Strategy has identified Preferred Management Options for each of the 14 Strategy units. The following four strategy units are targeted for priority intervention¹⁶:

Strategy Unit	Proposed Works	Timescale Implementation for
West Kirby	New flood prevention measures	2-3 years
Rock park Esplanade	Refurbishment works	3-4 years
Meols Parade	Sea Wall refurbishment	2-6 years
Wallasey Embankment	Embankment toe protection	11-20 years

- 4.15 The outcome of research on the probable effects of climate change in the UK was released in 2018 by the UK Climate Projections (UKCP18) team. UKCP18 gives climate information for the UK up to the end of this century and projections of future changes to the climate are provided, based on simulations from climate models. Projections are broken down to a regional level across the UK and are shown in probabilistic form, which illustrate the potential range of changes and the level of confidence in each prediction.

¹⁶ Wirral Metropolitan Borough Council (2016) 'Local Flood Risk Management Strategy 2016-2019' [online], available from: <https://www.wirral.gov.uk/sites/default/files/all/communities%20and%20neighbourhoods/Wirral%20Local%20Flood%20Risk%20Management%20Strategy.pdf>

File Name: 15004 - Information Systems\0509666 - Wirral Local Plan SA SFA02_Map\Figure 4 - Fluvial Flood Risk.mxd



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Wirral Borough Boundary
- Flood Zone 3
- Flood Zone 2

Copyright
Reproduced from Ordnance Survey digital map data
© Crown copyright 2019. All rights reserved.
Licence number 0100031673.
Contains Ordnance Survey Data © Crown Copyright
and database right 2019
Published under Open Government License (OGL)
version 3.0. Sourced from Environment Agency 2019.
© Crown copyright and database rights 2019
Ordnance Survey 100019803

Purpose of Issue
DRAFT

Client
WIRRAL BOROUGH COUNCIL

Project Title
**SCOPING REPORT FOR THE
SUSTAINABILITY APPRAISAL OF
THE WIRRAL LOCAL PLAN**

Drawing Title
FLUVIAL FLOOD RISK

Drawn TD	Checked JW	Approved CM	Date 01/03/2019
AECOM Internal Project No. 60596966		Scale @ A3 1:75,000	

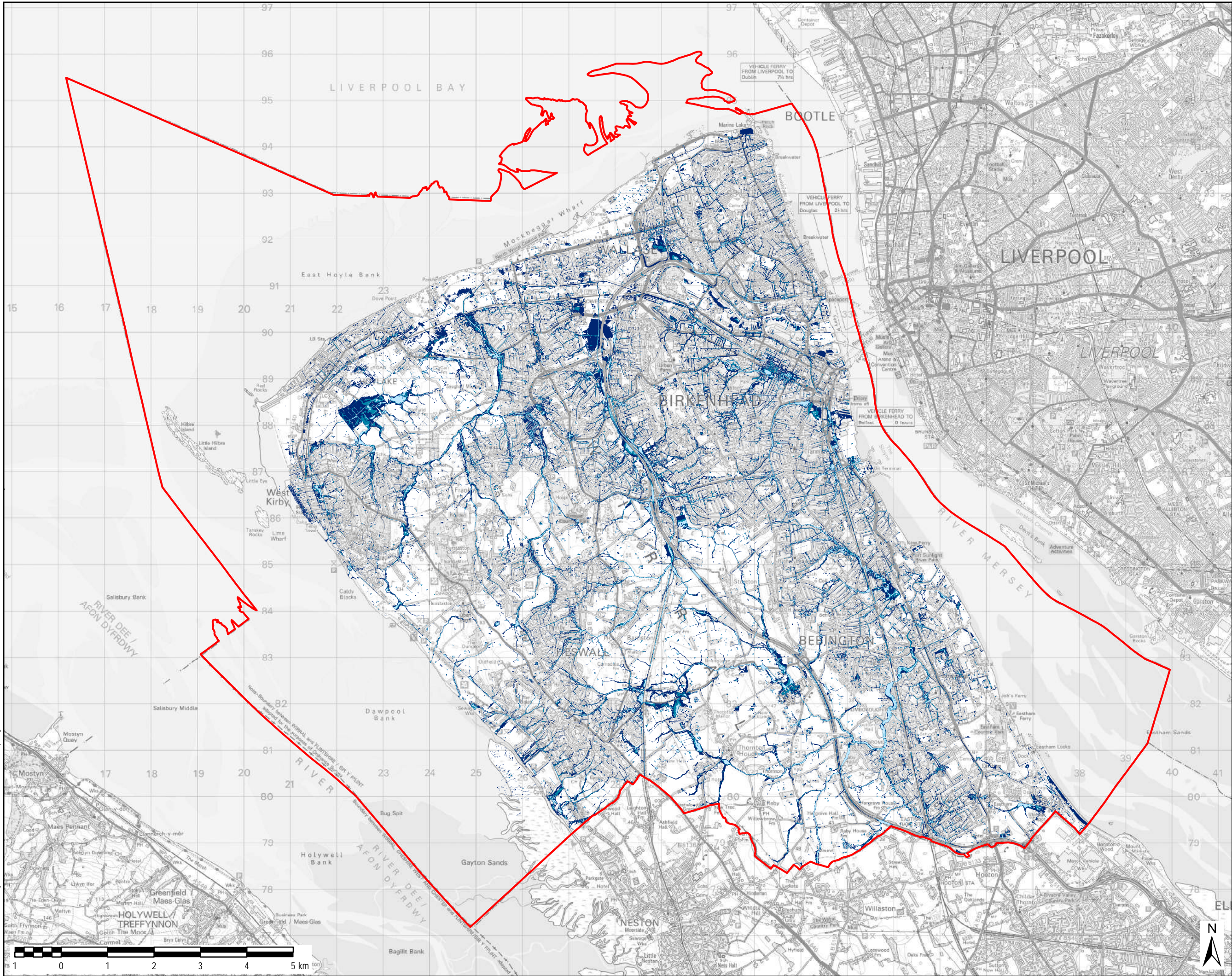
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.

AECOM
Midpoint
Alconon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number FIGURE 4.1	Rev
-------------------------------------	-----

AECOM

File Name: 15004 - Information Systems\05\96966 - Wirral Local Plan SA SEAN02_Maps\Figure 5 - Surface Water Flood Risk.mxd



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

- LEGEND**
- Wirral Borough Boundary
 - Surface Water Flood Risk Extent (1 in 30)
 - Surface Water Flood Risk Extent (1 in 100)
 - Surface Water Flood Risk Extent (1 in 1000)

Copyright
Reproduced from Ordnance Survey digital map data
© Crown copyright 2019. All rights reserved.
Licence number 0100031673.
Contains Ordnance Survey Data © Crown Copyright
and database right 2019
Published under Open Government License (OGL)
version 3.0. Sourced from Environment Agency 2019.

Purpose of Issue
DRAFT

Client
WIRRAL BOROUGH COUNCIL

Project Title
**SCOPING REPORT FOR THE
SUSTAINABILITY APPRAISAL OF
THE WIRRAL LOCAL PLAN**

Drawing Title
SURFACE WATER FLOOD RISK

Drawn TD	Checked JW	Approved CM	Date 01/03/2019
AECOM Internal Project No. 60596966		Scale @ A3 1:75,000	

THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.

AECOM
Midpoint
Alconon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

Drawing Number FIGURE 4.2	Rev
-------------------------------------	-----

AECOM

Future baseline

- 4.16 New development could have the potential to increase flood risk through factors such as changing surface and ground water flows, overloading existing inputs to the drainage and wastewater networks or increasing the number of residents exposed to areas of existing flood risk.
- 4.17 Coastal defences, both natural and manmade, will likely continue to provide a degree of protection for coastal communities, though it will be important to avoid increasing this risk by directing new development away from the most risk-affected areas of the Borough.
- 4.18 In the long term, climate change is likely to increase the level of coastal flood risk through sea level change, and there may eventually be a long term need to review the business and environmental case for maintaining flood defences in the face of changing risks. This is not considered likely over the plan period and maintaining flood defences will continue to be an important part of the flood defence strategy over the plan period.
- 4.19 As the climate continues to warm, it will become increasingly important to look for opportunities to reduce the 'heat island' effect in urban areas, particularly through integrating cooling features into new development such as areas of planting and natural shade.

Key issues and objectives

- 4.20 The following key issues emerge from the context baseline review:
- Coastal parts of the Borough are potentially vulnerable to tidal flooding with the main sources of flooding being the Dee and Mersey estuaries and Liverpool Bay.
 - Tidal flood defences are in place to protect some particularly vulnerable areas of coastline, and there is a degree of natural protection from sand dunes and sandy foreshore.
 - Fluvial flood risk is present, and occasionally high, adjacent to a number of smaller watercourses which crisscross the Borough.
 - It is anticipated that climate change will increase sea levels and cause weather to become more variable. It is therefore likely that the flood risk from tidal sources in the Borough will continue to increase over time.
- 4.21 In light of the key issues discussed above it is proposed that the SA framework should include the following objectives:
- Adapt to current and future flood risk by directing development away from the areas of the Borough at the highest risk of flooding from all sources and provide sustainable management of current and future flood risk through sensitive and innovative planning, development layout and construction.
 - Seek opportunities to deliver urban cooling features within new development.