

## Executive Summary

### Introduction

This Strategic Flood Risk Assessment (SFRA) 2016 document replaces the Level 1 SFRA originally published by Chelmsford City Council in 2008. The main purpose of the SFRA is to inform selection of options for Local Plan allocations and support determination of planning applications.

### SFRA objectives

The key objectives of the SFRA are:

1. To review the latest flood risk policy, including implications for the Council and developers
2. To collate and analyse the latest information and data for flood risk from all sources
3. To provide guidance and recommendation to the Council for flood risk policy and future flood risk management decision making
4. To provide supporting evidence to support the Council with the preparation of their Local Plan, allowing the application of the Sequential Test in the allocation of future development sites.
5. Provide guidance and information for developers preparing site specific flood risk assessments, including information on Sustainable Drainage Systems (SuDS).

### SFRA outputs

- Appraisal of all potential sources of flooding, including Main River, Ordinary Watercourse, the sea, surface water and groundwater.
- Updated review of historical flooding incidents.
- Mapping of location and extent of functional floodplain.
- Reporting on the standard of protection provided by existing flood risk management infrastructure.
- An assessment of the potential increase in flood risk due to climate change
- An assessment of existing flood warning and emergency planning procedures, including an assessment of safe access and egress during an extreme event.
- Recommendations of the criteria that should be used to assess future development proposals and the development of a Sequential Test and sequential approach to flood risk
- Level 2 assessment detailed site summary tables for proposed development sites
- A suite of maps has been produced for the SFRA including
  - Appendix A: Watercourses in Chelmsford
  - Appendix B: Environment Agency Flood Zone Mapping
  - Appendix C: Climate Change Mapping
  - Appendix D: Surface Water Mapping
  - Appendix E: Groundwater Mapping
  - Appendix F: Flood Warning Coverage

### Summary

#### Sources of flood risk

- Flood history shows that Chelmsford has been subject to flooding from several sources of flood risk, with the principal risk from fluvial sources.
- The primary fluvial flood risk is associated with the River Chelmer and its tributaries. The main urban areas at risk is Chelmsford City. Parts of Chelmsford City benefit from defences including flood walls and embankments. Other areas that are shown to be at risk include Margaretting, Bicknacre and Writtle.
- The primary tidal flood risk is associated with the tidal River Crouch, Fenn Creek and Clements Green Creek. The main urban area at risk is South Woodham Ferrers. However, much of the area benefits from defences consisting of sea walls and embankments.
- Surface water risk predominantly consists of overland flow routes; these predominantly follow topographical flow paths of existing watercourses or dry valleys, or transport routes.

There is also isolated ponding located in low lying areas. The majority of towns and villages within Chelmsford have a degree of surface water flood risk; whilst, in the majority of cases, the risk is confined to roads and gardens, there are some areas with more notable, prominent flow routes around properties.

- The sewers are managed by Anglian Water. The DG5 register of recorded historical sewer flooding was requested but not provided at the time of publication.
- There are no records of flooding from reservoirs impacting properties inside the study area. The level and standard of inspection and maintenance required under the Reservoir Act 1975 means that the risk of flooding from reservoirs is relatively low.

### **Key policies**

There are a number of relevant regional and local key policies which have been considered within the SFRA, such as the Catchment Flood Management Plan (2011), River Basin Flood Risk Management Plan (2016), the Preliminary Flood Risk Assessment (2011), Chelmsford Surface Water Management Plan (2014) and Local Flood Risk Management Strategy (2013). Other policy considerations have also been incorporated, such as sustainable development principles, climate change and flood risk management.

### **Development and flood risk**

The Sequential and Exception Test procedures for both Local Plans and Flood Risk Assessments (FRAs) have been documented, along with guidance for planners and developers. Links have been provided for various guidance documents and policies published by other Risk Management Authorities such as the Lead Local Flood Authority (LLFA) and the Environment Agency.

### **Defences**

This SFRA provides an overview of existing flood defences in Chelmsford using technical studies undertaken by other Flood Risk Management Authorities including the Environment Agency. There are a number of formal defences in the study area. Defences mainly consist of sea walls and embankments providing protection against tidal sources for South Woodham Ferrers, and walls and embankment providing protection against fluvial sources for Chelmsford City.

### **Flood warning and emergency planning**

A review of the flood warning coverage in Chelmsford was undertaken as well as emergency planning provision.

### **Strategic flood risk solutions**

Potential options for strategic flood risk solutions have been documented.

### **Level 1 assessment of sites**

Proposed allocation sites within the study area were screened against a suite of available flood risk information and spatial data to provide a summary of risk to each site. Indication is provided on the proportion of a given site affected by levels and types of flood risk, along with whether historic incidences of flooding have occurred, and any watercourses with a catchment less than 3km<sup>2</sup> flow through the site.

Of the 47 potential development sites provided by Chelmsford City Council for assessment, ten were at risk in Flood Zones 3b, 3a and 2, five were at risk in Flood Zones 3a and 2, and two were at risk in Flood Zone 2. The majority of the sites at risk are located in Chelmsford City. Flood Zones 2 and 3 act as a constraint on land use and layout, and one that needs to be addressed through the Level 2 SFRA, site specific flood risk assessments and site planning. Of the remaining sites, all but three were shown to be at risk of surface water flooding.

It should be noted that the proportion of the site at risk varied. Full details are provided in Table 12-1.

### **Level 2 assessment of sites**

As part of the Level 2 SFRA, detailed site summary tables have been produced for each of the potential development sites taken forward from the Level 1 assessment. These sites are ones which are shown to be at risk of fluvial flood risk from watercourses running either through or adjacent to the site.

The summary tables set out the flood risk to each site, including maps of extent, depth and velocity of flooding as well as hazard mapping. Each table also sets out the flood risk implications for the

site as well as guidance for site-specific FRAs. A broadscale assessment of possible SuDS constraints has also been provided giving an indication where there may be constraints to certain sets of SuDS components.

## Recommendations

### Development control

#### *Sequential approach to development*

The NPPF supports a risk-based and sequential approach to development and flood risk in England, so that development is located in the lowest flood risk areas where possible; it is recommended that this approach is adopted for all future developments within the district.

New development and re-development of land should wherever possible seek opportunities to reduce overall level of flood risk at the site

#### *Cumulative impact of development and cross-boundary issues*

The cumulative impact of development should be considered at the planning application and development design stages and the appropriate mitigation measures undertaken to ensure flood risk is not exacerbated, and in many cases the development should be used to improve the flood risk

Development control should ensure that the impact on receiving watercourses from development in Chelmsford has been sufficiently considered during the planning stages and appropriate mitigation measures put in place to ensure there is no adverse impact on flood risk or water quality, both within Chelmsford and the wider area.

#### *Sequential and Exception tests*

The SFRA has identified that areas of Chelmsford are at risk of flooding from both fluvial, tidal and surface water sources. Therefore, potential development sites for the Local Plan will be required to pass the Sequential and, where necessary, Exception Tests in accordance with the NPPF. The Council should use the information in this SFRA when deciding which development sites to take forward in their Local Plan.

Developers should consult with the Council, Essex County Council, the Environment Agency, and Anglian Water at an early stage to discuss flood risk including requirements for site-specific FRAs, detailed hydraulic modelling, and drainage assessment and design.

#### *Site-specific flood risk assessments*

The SFRA is not intended to replace site-specific FRAs. Site specific FRAs are required by developers to provide a greater level of detail on flood risk and any protection provided by defences and, where necessary, demonstrate the development passes part b of the Exception Test.

Developers should, where required, undertake more detailed hydrological and hydraulic assessments of the watercourses to verify flood extent (including latest climate change allowances), inform development zoning within the site and prove, if required, whether the Exception Test can be passed. The assessment should also identify the risk of existing flooding to adjacent land and properties to establish whether there is a requirement to secure land to implement strategic flood risk management measures to alleviate existing and future flood risk.

#### *Residual risk*

The risk to development from reservoirs is residual but developers should consider reservoir flooding during the planning stage. They should seek to contact the reservoir owner to obtain information and should apply the sequential approach to locating development within the site. Developers should also consult with relevant authorities regarding emergency plans in case of reservoir breach

Developers should include an assessment of the residual risk where developments are located in areas benefitting from defences. They should consider both the impact of breach (both on and off site), including the effect on safe access and egress, as well as potential for flood risk to increase in the future due to overtopping. Any improvements to defences should ensure they are in keeping with wider catchment policy.

### *Safe access and egress*

Safe access and egress will need to be demonstrated at all development sites and emergency vehicular access should be possible during times of flood. Finished Floor Levels should be above the 1 in 100-year (1% AEP) flood level, plus an allowance for climate change.

Where development is located behind, or in an area benefitting from, defences, consideration should be given to the potential for safe access and egress in the event of rapid inundation of water due to a defence breach with no warning

### **Drainage assessments and promotion of SuDS**

#### *Drainage strategies and SuDS*

Planners should be aware of the conditions set by the LLFA for surface water management and ensure development proposals and applications are compliant with the Council's policy. These policies should also be incorporated into the Local Plan. Wherever possible, SuDS should be promoted.

Development in CDAs should conform with the preferred options for the CDA, as set out in the Chelmsford SWMP.

### **Future flood management in Chelmsford**

- It is preferential that developments take a sequential approach to site layout, with the development being placed furthest away from the source of flood risk and outside of the Flood Zones 2 and 3, if possible
- The construction of upstream storage schemes on watercourses within the district may provide one potential strategic solution to flood risk. Watercourses which are rural in their upper reaches but have high levels of flood risk to urban areas in the downstream reaches are potential candidates, as the open land in the upper reaches can potentially provide the space for an attenuation area, providing benefit to the urban area downstream. However, site assessments have shown that the majority of sites are too small, or are on urbanised watercourses, to provide opportunities for storage. The proposed flood storage area on the River Wid at Margaretting, as part of the on-going Flood Alleviation Scheme at Chelmsford city centre, is a key part of the Council and Environment Agency's strategy to protect people and property in Chelmsford.

### **Flood warning and emergency planning**

- It is essential that any development which will be required to remain operational during a flood event is located in the lowest flood risk zones to ensure that, in an emergency, operations are not impacted on by flood water. All flood sources should be considered. In particular sites should be considered in relation to the areas of drainage critical problems highlighted in the Chelmsford SWMP.
- The outputs of this SFRA should be compared and reviewed against any emergency plans and continuity arrangements within Chelmsford. This includes the nominated rest and reception centres (and prospective ones), to ensure evacuees are outside of the high risk flood zones and will be safe during a flood event.

### **Technical note**

It is important to recognise that the SFRA has been developed using the best available information at the time of preparation. This relates both to the current risk of flooding from rivers, and the potential impacts of future climate change.

The Environment Agency regularly reviews their flood risk mapping, and it is important that they are approached to determine whether updated (more accurate) information is available prior to commencing a site-specific FRA.