Chelmsford Surface Water Management Plan

Final Draft
March 2014

Prepared for

Essex County Council

Chelmsford City Council

Executive Summary

This document forms the Surface Water Management Plan (SWMP) for Chelmsford. The report outlines the preferred surface water management strategy for Chelmsford. The study area was selected to focus on the area of highest surface water flood risk – the city of Chelmsford and a number of surrounding settlements. In this context surface water flooding describes flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.

A four phase approach has been undertaken in line with Defra's SWMP technical guidance (2010). These are:

Phase 1 – Preparation
Phase 2 – Risk Assessment
Phase 3 – Options
Phase 4 – Implementation and Review

Phase 1: Preparation

Phase 1 work involved the collection and review of surface water information from key stakeholders and the building of partnerships between key stakeholders responsible for local flood risk management.

Phase 2: Risk Assessment

As part of the Phase 2 Risk Assessment, direct rainfall modelling was undertaken across the study area for five rainfall event return periods. The results of this modelling were used to identify Critical Drainage Areas (CDAs) representing the contributing catchment area and features that influence areas of significant predicted surface water flooding impacts.

Within the study area, 12 CDAs have been identified and are presented in the figure below. The dominant mechanisms for flooding can be broadly divided into the following categories:

- River Valleys (current and historical) - Across the study area, the areas particularly susceptible to overland flow are formed by narrow corridors associated with topographical valleys which represent the routes of 'lost' rivers
- Topographical Low Lying Areas - areas such as underpasses, subways and lowered roads beneath railway lines are more susceptible to surface water flooding
- Railway Cuttings: stretches of railway track in cuttings are susceptible to surface water flooding and, if flooded, will impact on services
- Railway Embankments and Fluvial Flood Defence Embankments - discrete surface water flooding locations along the upstream side of raised embankments
- Topographical Low Points – areas which are at topographical low points throughout the study area which result in small, discrete areas of deep surface water ponding
- Sewer Flood Risk – areas where extensive and deep surface water flooding is likely to be the influence of sewer flooding mechanisms alongside pluvial and groundwater sources
- Fluvial Flood Risk - areas where extensive and deep surface water flooding is likely to be the influence of fluvial flooding mechanisms (alongside pluvial, groundwater and sewer flooding sources)

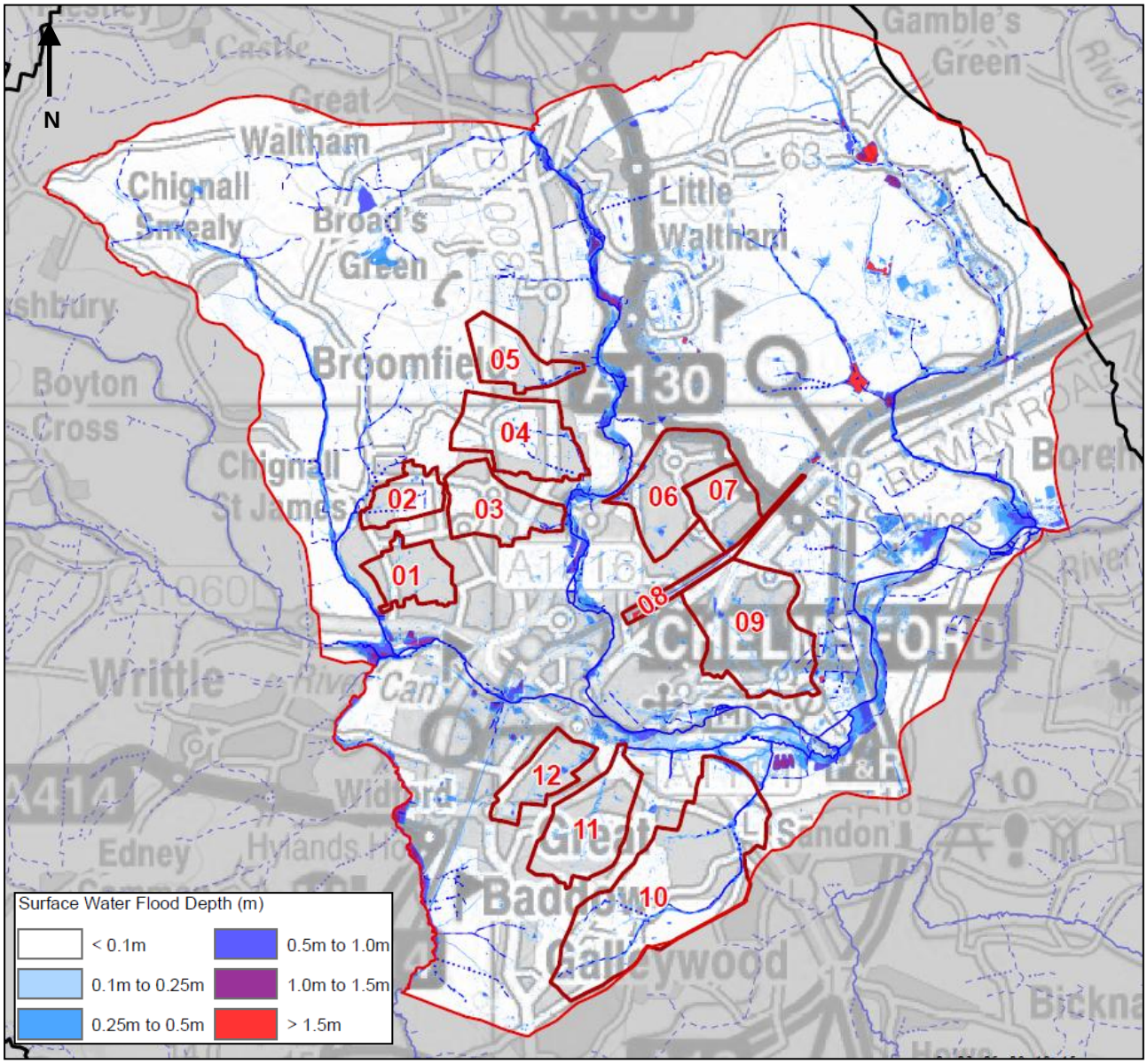

Figure i: Critical Drainage Areas within the Study Area

Analysis of the number of properties at risk of flooding has been undertaken for the rainfall event with a 1 in 100 probability of occurrence in any given year. A review of the results predicts that 1746 properties in the study area could be at risk of surface water flooding of a depth greater than 0.1m during a 100 year rainfall event (above an assumed 0.1m building threshold), refer to Table i below.

Table i. Predicted Flooded Properties Summary – 1 in 100 Year Flood Event. Depths > 0.1m

Administration Boundary	Infrastructure	Households		Commercial / Industrial	Other (Unclassified Landuse)	Total
		Non-Deprived	Deprived			
Chelmsford	4	1046	1	98	597	**1746**

Phase 3: Options Assessment

There are a number of opportunities for measures to be implemented across the catchment to reduce the likelihood and impact of surface water flooding. Ongoing maintenance of the drainage network and small scale improvements are already undertaken by Chelmsford City Council, Essex County Council and other statutory bodies as part of normal operation within the study area.

It is important to recognise that flooding within the study area is not confined to just the CDAs, and therefore, there are opportunities for generic measures to be implemented through the establishment of a policy position on issues including the widespread use of water conservation measures such as water butts and rainwater harvesting technology, use of swales, permeable paving, bioretention car park pods and green roofs. In addition, there are study area wide opportunities to raise community awareness.

For each of the CDAs identified within the study area, site-specific measures have been identified that could be considered to help reduce the risk of surface water flooding. These measures were subsequently short listed to identify a potential preferred option for each CDA.

Pluvial modelling undertaken as part of the SWMP has identified that flooding is heavily influenced by existing and historic watercourse valleys, and impacts a number of regionally important infrastructure assets. It is recommended that in the short-to-medium term Essex County Council and Chelmsford City Council work together to:

- Engage with residents regarding the flood risk in their areas, to make them aware of their responsibilities for property drainage (especially in the CDAs) and steps that can be taken to improve flood resilience
- Provide information to residents, to inform them of measures that can be taken to mitigate surface water flooding to/around their property
- Prepare and implement a communication strategy to effectively communicate and raise awareness of surface water flood risk to different audiences using a clearly defined process for internal and external communication with stakeholders and the public
- Improve maintenance regimes, and target those areas identified to regularly flood or known to have blocked gullies / culverts / watercourses

Phase 4 Implementation & Review

Phase 4 establishes a long-term Action Plan for ECC and other Risk Management Authorities to assist in delivery of their respective roles under the FWMA 2010 to lead in the management of surface water flood risk across the study area. The purpose of the Action Plan is to:

- Outline the actions required to implement the preferred options identified in Phase 3
- Identify the partners or stakeholders responsible for implementing the action
- Provide an indication of the priority of the actions and a timescale for delivery
- Outline actions required to meet the requirements of Risk Management Authorities as delegated by Essex County Council (LLFA) under the FWMA 2010

The SWMP Action Plan is a 'living' document, and as such, should be reviewed and updated regularly, particularly following the occurrence of a surface water flood event, when additional data or modelling becomes available, following the outcome of investment decisions by partners and following any additional major development or changes in the catchment which may influence the surface water flood risk within the study area.