



# TGSEP SFRA

## EXECUTIVE SUMMARY NOVEMBER 2006

### Background

Scott Wilson Ltd was commissioned by the Thames Gateway South Essex Partnership in January 2006 to undertake a Strategic Flood Risk Assessment (SFRA) of South Essex, based on a Brief issued by the partnership. The Brief, prepared by Faber Maunsell (October 2005) set out the approach and general methodology including assumptions for the main SFRA report.

The Thames Gateway South Essex Partnership (TGSEP) incorporates Thurrock Council, Basildon District Council, Castle Point Borough Council, Southend-on-Sea Borough Council, Rochford District Council, Essex County Council and other public and private sector partners. This project was carried out in collaboration with the Environment Agency's Anglian Region, and a draft of this report was submitted to the Agency for their comments and observations, mutually acceptable amendments have been incorporated into this final SFRA report.

### Flood Risk in South Essex

It is no surprise in reflection of the historic flooding events that have affected South Essex, that most of the 40km coastline is defended from tidal flooding by embankments, hard defences and moveable barriers. These defences provide a level of defence to existing communities and land interests which is generally considered acceptable by the Environment Agency. In addition, the Environment Agency has an ongoing programme of maintenance of the defences and is currently undertaking a major series of studies collectively known as the 'Thames 2100' project which are focused on the future flood defence requirements in the area and the need for replacement or enhancement of flood defences post-2030.

One of the main assumptions included in the Brief, was that the existing defences should be regarded at their present defence height and condition for the next fifty years. Taking this into account the main focus of the SFRA was therefore placed on the residual risk of flooding from a breach event in the flood defences.

### Planning Objectives

The primary objective of the study was to enable the five participating local authorities to undertake sequential testing inline with government flood risk and development policy guidance documents - PPG25 and impending PPS25 - to inform the development of their emerging Local Development Framework (LDF) documents.

The purpose of the SFRA was to assist the development of the LDF's by identifying flood risk areas and outlining the principles for sustainable development policies, informing strategic land allocations and integrating flood risk management into the spatial planning of South Essex. The SFRA thereby forms an essential reference tool in the future spatial planning of the region.

## **Report Layout**

The main background and methodology information, including guidance on approaching the sequential test using the hazard mapping, and potential measures for residual risk management are discussed in this main SFRA report. For each participating authority a suitable appendix has been compiled to include a background information on that area with regards to flood risk, additional requested information as part of the SFRA Brief and associated hazard mapping and depth mapping for that area. The general figures to accompany the main SFRA, such as location maps and topography etc are included in Appendix A.

## **Report Scope**

The SFRA study, based on the findings and conclusions of the Brief, was to include the following main topics including agreed supplementary work for the participating authorities:

- Identification and mapping of flood risk zones as defined in PPG25 for the South Essex region;
- Identification and mapping of residual risk flood zones within Flood zone 3, into high, medium and low risk areas, to allow more detailed consideration of the sequential test;
- Undertake 2D hydraulic modelling of specified breach locations to inform definition of hazard zones, taking into consideration the effects of climate change. (25 breach locations were identified initially with a further nine locations identified and modelled during the course of the study);
- Flood risk assessments for a number of development areas within the area of South Essex. (Thurrock District Council subsequently defined three specific locations).
- Consideration of surface water and flood storage areas within the area of Basildon;
- Consideration into the probabilities of various breach sources for the area of Canvey Island;
- Preparation of guidance and application methods for the SFRA, taking into account emerging PPS25 (at the time of writing this report, only the draft consultation PPS25 had been released) in the sequential test, and the potential use of hazard zones to assist in future planning policy and integration of flood risk management into spatial planning.

## **Flood Sources**

In total thirty-four potential breach locations were identified in the existing defences, within the respective fourteen defined flood cells covering the participating local authorities of Thurrock, Southend, Castle Point, Rochford and Basildon. These locations were identified in liaison with each individual local authority, to ensure that they reflected the key proposed or likely development areas in future LDF's.

The starting point of the hydraulic modelling, which forms the key deliverable of the SFRA, was to produce high quality topographic mapping for the entire area of South Essex. This allowed assessment of the fourteen flood cell boundaries and formed the basis of the 2D hydraulic modelling. A detailed hazard of 'flood consequence' methodology, previously developed by Scott Wilson and agreed by the Environment Agency, was then applied to the hydraulic modelling results. This allowed the definition of area of high, medium and low residual risk as a result of the identified breach scenario.

Flood risk on fluvial rivers is less well documented in the SFRA, due to the predominant concern expressed in the Brief towards greater consideration on tidal flooding. Fluvial flood risk, which

varies on a spatial and temporal scale in South Essex, is addressed within the specific area appendices. A precautionary approach to the categorisation of fluvial associated flood zones within South Essex has been applied.

Surface water and groundwater data for the study area was limited, although several drainage reports for Canvey Island, Thurrock and Basildon were made available. These reports were reviewed and incorporated into the completion of the relevant area appendices as required. The drainage reports did not identify flooding events relating to groundwater or surface water events.

### **Flood Mapping**

The SFRA mapping information has been provided to the participating authorities and Environment Agency on a DVD, to allow incorporating of the GIS outputs into their existing systems, to facilitate access as required to planners, engineers and emergency response officers to enable a detailed understanding of the associated residual risk of flooding within South Essex.

The results of the SFRA are presented in the relevant local authority appendices as a set of A3 maps covering the study area, and show the residual flood risk at any point in terms of high, medium and low hazard, as a result of the specified breach scenarios.

Maps are presented flood cell by flood cell, and also by each specific breach event for both the 1 in 200-year and 1 in 1000-year event. These maps take into account the existing topography and existing flood defences, and allow further detail on levels of residual risk to be presented alongside the Environment Agency's floodplain maps, which estimate flood risk without the presence of existing defences.

### **Further Benefits**

The SFRA additionally provides useful tools for use in emergency planning in the South Essex region. It is hoped that the study outputs, in particular animations of flooding at the local scale and flood depth and velocity mapping, will be used by partner local authorities or at County level, to inform the ongoing development of Emergency Plans. The consideration of the needs of residents during a severe flood event is a core theme of the emerging PPS25 guidance, as is the production of evacuation plans or similar documents for those areas where residual flood risk is of particular concern or existing development especially vulnerable.