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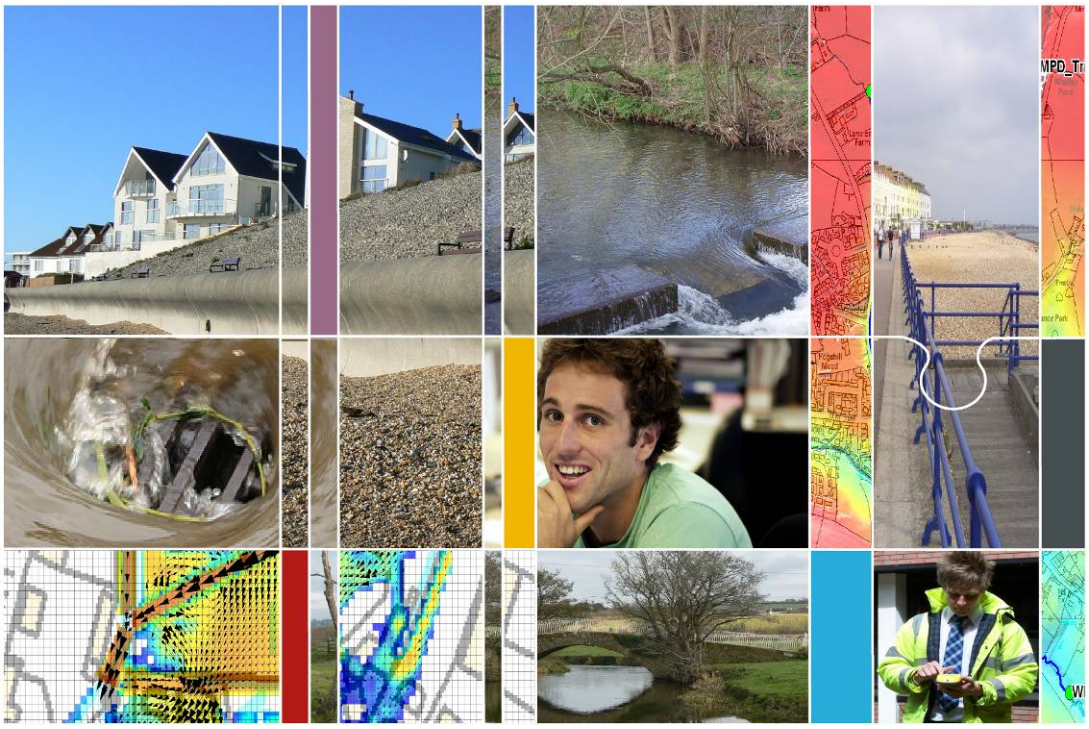

Medway Council Local Flood Risk Management Strategy

Draft Report

January 2014

CAPITA SYMONDS | URS
Flood Risk Management

Document overview

Capita Symonds with URS Infrastructure and Environment UK Ltd was commissioned by Medway Council in the preparation of their Local Flood Risk Management Strategy as required under the Flood and Water Management Act 2010.

Document history

Version	Status	Issue date	Prepared by	Reviewed by	Approved by
1	Draft	Aug 2012	Sarah Littlewood Assistant Consultant Stephen Riley Principal Consultant	Stephen Riley Principal Consultant Jon Robinson Technical Director	Jon Robinson Technical Director Scott Ferguson Technical Director
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3	Draft	December 2013	Edward Byers Assistant Consultant	Emily Craven Principal Consultant	Jon Robinson Technical Director

Notice

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Foreword

This is Medway's first Local Flood Risk Management Strategy. Local flood risk is associated with flooding caused by surface runoff, groundwater and small watercourses, known as 'ordinary watercourses' (ditches and streams).

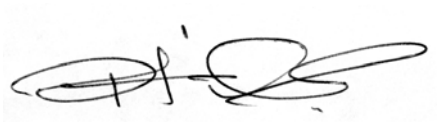
Flooding has a devastating impact on people and communities. Surface water flooding in particular was one of the major causes of widespread flooding experienced across England in 2007 as well as contributing more recently to the devastating impacts of flooding during 2013/2014.

We know that some of our areas are at risk to local flooding and do suffer from flooding from time to time. The likelihood of similar events to those flood events witnessed across England in 2007 and more recently is set to increase because of more extreme weather. This also means that some areas are at risk of flooding which may have never flooded previously are now considered to be at risk.

The Governments response to flooding experienced in 2007 resulted in a wide-ranging review of flood risk management policy published in the Pitt Review. The review resulted in legislation that required all County and Unitary Authorities to take on a role as a 'Lead Local Flood Authority'. Part of that role is to produce a strategy to ensure local flood risk is managed in a more coordinated way, enabling organisations to work better with each other and the public.

Assessing the risk from flooding can be a difficult task and that is the main focus of this strategy, to set a framework around what needs to be done to understand and manage flood risk in Medway.

We're keen to hear your views and receive any further information you may have on flood risk in your area.



Councillor Phil Filmer
Portfolio Holder, Front Line Services.

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Executive Summary

This Local Flood Risk Management Strategy 'the strategy' is a statutory document required by County and Unitary authorities under the Flood and Water Management Act 2010 (FWMA 2010).

Medway Council as a Lead Local Flood Authority are responsible for local flood risk management (defined by the FWMA 2010 as flood risk associated with surface water, ground water and ditches/streams). The Environment Agency (EA) remains the responsible authority for the management of tidal and river flood risk (from main rivers) and has produced a National Flood and Coastal Erosion Risk Management Strategy, which outlines their approach to manage those risks.

Although this strategy focuses on local flood risk, we are keen to make sure that all forms of flooding are considered and managed together according to the level of risk by working in partnership with the relevant authority.

The content under the following headings summarises the detail from each of the sections listed within the main report.

Section 1: Introduction

This section outlines why a strategy is required, who it is aimed at, and summarises the aim and objectives of the strategy.

Section 2: Legislation and policy

Provides a summary of the legislation and national and local policies relevant to the strategy. This includes an overview of previously completed studies and strategies and plans relevant to all forms of flood risk in Medway.

Section 3: Overview of flooding in Medway

This section provides an overview of local flood risk within Medway including historical flooding records.

Section 4: Managing flood risk in Medway

Authorities, organisations and individuals with responsibility for, and interest in, the management of local flood risk are identified in this section. It includes specific reference to the Risk Management Authorities (RMA's) defined in the FWMA 2010 and provides clarity on their roles and responsibilities.

The key RMA's within the Medway area are:

- Medway Council (Lead Local Flood Authority).
- Environment Agency.
- Highways Authority (within Medway Council).
- Lower Medway Internal Drainage Board.
- Southern Water.

Section 5: Flood Risk Management objectives

This section summarises the derivation of our local flood risk management objectives. The objectives defined are listed below, and have been developed to be consistent with the Environment Agency's National Flood and Coastal Erosion Risk Management Strategy.

Medway Council will:

1. Work with internal and external stakeholders to develop a collective understanding of local flood risk to enable successful local flood risk management;
2. Monitor flood risk;
3. Ensure local policy is consistent with wider flood risk management policies and legislation at a national and regional level and provide clear advice on how to satisfy those policies within Medway;
4. Promote the use of Sustainable Drainage Systems (SuDs) in accordance with its forthcoming role as SuDS Advisory Body and the forthcoming National Standards;
5. Take account of the cumulative effect of development and climate change on the risk of flooding throughout Medway;
6. Ensure that all development has a positive or nil effect on the risk of flooding to and arising from proposed development;
7. Use flood risk information to implement a risk based approach to capital investment decisions and maintenance programmes and activities;
8. Give consideration to the economic, social and environmental benefits and limitations of flood risk management measures when making investment decisions;
9. Consider how future infrastructure improvements (e.g. highways/rail/public realm works) and/or changes could be used to deliver flood risk/surface water management benefits;
10. Share information with respect to flood risk across Medway with all Risk Management Authorities and the public;
11. Increase public awareness (property owners, developers) with respect to flood risk and responsibility for flood risk management;

12. Use information on flood risk as a tool for flood prediction and warning;
13. Ensure that emergency plans and responses to flood incidents in Medway are effective;
14. Ensure that communities understand the risks and their role and the role of Medway Council during an emergency.

Section 6: Measures for managing flood risk

This section outlines the approach to identify specific measures to achieve the objectives listed above. Due to the lack of good quality datasets, the strategy has focused on non-structural measures to enable the creation of a robust evidence base to identify critical drainage areas and significant flood risk areas. This information will then be used to inform structural options / measures and to prioritise flood risk management in the future.

The section also outlines the delivery of the measures including what departments within the council have responsibility for implementation and the timeframe by which the measures are expected to be carried out.

Section 7: Funding options

A summary of available sources of funding is provided in section 7 to help identify any further actions that will be needed to ensure that particular funding options are available. An overview of the following funding sources is provided: Area based grants, public funding from Flood Defence Grant in Aid, Community Infrastructure Levy, private funding through Section 106 agreements, local fundraising and other sources.

Section 8: Wider environmental objectives

Section 8 presents an assessment undertaken to consider how the strategy contributes to the achievement of Medway Council's wider environmental objectives. This has included a review of the environmental objectives contained within policy documents specific to the area.

The section also appraises the need for a Strategic Environmental Assessment (SEA) under the European Directive 2001/42/EC and associated Environmental Assessment of Plans and Programmes Regulations 2004.

Section 9: Review and update

This section considers the requirement to review and update the strategy and appraises the internal council procedures for review and the timeframes considered appropriate for update of the objectives and measures contained within the strategy.

Next Steps

Following consultation with the public and other risk management authorities, annual action plans will be produced in order to measure progress and inform further actions and investment decisions.

1. Introduction

1.1 Why has a Strategy been produced?

1.1.1 In 2008, Sir Michael Pitt published a report entitled 'Learning Lessons from the 2007 Floods'[1]. This report outlined the need for changes in the way the UK is adapting to the increased risk of flooding.

1.1.2 The Flood and Water Management Act[2] (FWMA), which gained Royal Assent in 2010, is an important part of the Government's response to Sir Michael Pitt's report. Through the FWMA, local authorities have a duty to take the lead in the management of local flood risk. Medway Council, as a designated Lead Local Flood Authority (LLFA), must 'develop, maintain and apply a Local Flood Risk Management Strategy' which will clarify who is responsible for local flood risk management and enable effective partnerships to be formed between relevant Risk Management Authorities.

1.1.3 The strategy will address local flood risk, which is defined as the risk of flooding from surface water runoff, groundwater and ordinary watercourses[3].

1.1.4 It is not possible to prevent all flooding; however, over time, Medway Council will use the strategy to increase the level of understanding of local flood risk posed to the community and to take the lead in effectively implementing measures to manage the risk where appropriate.

1.1.5 This document establishes the starting point for a long-term strategy to manage flood risk, which will influence future capital investment, maintenance, public engagement and understanding, land-use planning, emergency planning and future developments across Medway.

1.2 Who is the strategy aimed at?

1.2.1 The strategy is primarily intended as a document for use by Medway Council to assist them in the management of flood risk within their administrative area.

1.2.2 The document should also be of interest to RMA's (identified in Section 4) as well as individuals, communities, businesses and the general public who have an interest in the management of flood risk within the Medway Council administrative area.

[1] Cabinet Office (2008) Pitt Review – Learning Lessons from the 2007 Floods
[2] HMSO and the Queen's Printer of Acts of Parliament (2010) Flood and Water Management Act
[3] Strategies for the management of flood risk from main rivers and tidal flooding are managed by the Environment Agency (EA) communicated in their National Strategy, Catchment Flood Management Plans (CFMP) and Shoreline Management Plans (SMP).

1.2.3 An Executive Summary of this document is included that sets out the main aspects of the strategy.

1.3 Aim

1.3.1 The aim of the strategy is to outline the approach Medway Council, as LLFA will take to local flood risk management and record how this approach has been developed and agreed.

1.4 Objectives

1.4.1 In order to achieve the above aim, Part 1, Article 2, Section 9 Sub-section 1 of the FWMA states that: a Lead Local Flood Authority for an area in England must develop, maintain, apply and monitor a strategy for local flood risk management in its area (a Local Flood Risk Management Strategy). Part 1, Article 2, Section 9 Sub-section 1 of the FWMA states that the strategy must specify:

a) the RMAs in the authority's area.
b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area.
c) the objectives for managing local flood risk (the strategy will inform objectives to be included in the authority's flood risk management plan which is required in accordance with the Flood Risk Regulations 2009).
d) the measures proposed to achieve those objectives.
e) how and when the measures are expected to be implemented.
f) the costs and benefits of those measures, and how they are to be paid for.
g) the assessment of local flood risk for the purpose of the strategy, (local flood risk is defined by the FWMA as flood risk from:
    - surface water
    - ground water and
    - ordinary watercourses
h) how and when the strategy is to be reviewed, and
i) how the strategy contributes to the achievement of wider environmental objectives.

2. Legislation and policy

2.1 Overview

2.1.1 This section provides a brief overview of the key legislative and national policy relevant to flood risk management in England, and a summary of local policy and existing flood risk studies and plans relevant to Medway.

2.2 Legislation

Flood and Water Management Act (2010)

2.2.1 The FWMA presents a number of challenges for policy makers and flood and coastal Risk Management Authorities to co-ordinate and deliver local flood risk management. It reinforces the need to manage flooding holistically and in a sustainable manner. This has grown from the key principles within Making Space for Water[4] and was further reinforced by the Pitt Review following the summer 2007 floods.

2.2.2 The FWMA implements several key recommendations of Sir Michael Pitt's Review of the summer 2007 floods, whilst also protecting water supplies to consumers and protecting community groups from excessive charges for surface water drainage.

2.2.3 Further information regarding the duties and powers Medway Council have as a LLFA under the FWMA is included within Section 4.

Flood Risk Regulations (2009)

2.2.4 The FWMA must also be considered in the context of the EU Floods Directive 2007/60/EC, which was transposed into UK law by the Flood Risk Regulations 2009 (the Regulations) on 10 December 2009. The Regulations require LLFAs to undertake three types of assessment/plan.

- Preliminary Flood Risk Assessment (PFRA): A report detailing information on past and future (potential) floods, and the identification of Flood Risk Areas. LLFAs are only required to undertake a PFRA for local sources of flooding. It is the responsibility of the Environment Agency to assess the flood risk from Main Rivers, the sea and reservoirs. Medway Council completed their PFRA[5] report and spreadsheets in accordance with the 22nd December 2011 deadline stipulated by the Regulations.

[4] Defra (February 2005) Making Space for Water
[5] Medway Council (2011) Preliminary Flood Risk Assessment Report

- Flood Hazard Maps and Flood Risk Maps: Following the identification of Flood Risk Areas, the EA and LLFAs are required to produce Hazard and Risk maps for sea, Main River and reservoir flooding as well as 'other' relevant sources by 22nd December 2013.
- Flood Risk Management Plans: The EA and LLFAs are required to produce Flood Risk Management Plans for sea, Main River and reservoir flooding as well as 'other' relevant sources by 22 December 2015.

2.2.5 The following legislation is also relevant to local flood risk management:

- The Highways Act 1980: An Act dealing with the management and operation of the road network in England and Wales including the drainage of highways.
- The Wildlife and Countryside Act 1981: This Act includes powers for the purposes of preventing serious damage to inland waters.
- The Building Act 1984: (also the Sustainable and Secure Buildings Act 2004 and Climate Change and Sustainable Energy Act 2006). Includes Building Regulations covering drainage of buildings and guidance for preventing the undue consumption, misuse or contamination of water.
- Environmental Protection Act 1990: Restrictions relating to the pollution of controlled waters.
- Town and Country Planning Act 1990: Regulation of development in England and Wales. Flood risk, policies are included with the National Planning Policy Framework (NPPF).
- Land Drainage Act 1991: An Act to consolidate the enactments relating to Internal Drainage Boards, and to the functions of such boards and of Local Authorities in relation to land drainage.
- Water Resources Act 1991: Regulates water resources, water quality and flood defence.
- Environment Act 1995: An Act, which led to the formation of the Environment Agency and sets out standards for environmental management.
- The Water Act 2003: Provided changes to legislation included in the Water Resources Act 1991 in relation to the abstraction and impounding of water.
- Civil Contingencies Act 2004: Establishes a framework for Emergency Planning.
- Climate Change Act 2008: Established a Committee on Climate Change and made provisions about adaptation to climate change.
- Localism Act 2011: Included the abolition of regional strategies and a duty to co-operate to planning of sustainable development.

- EU SEA Directive (2001/42/EC): This is mandatory for plans/programmes which are prepared for water management to determine whether the plans / programmes are likely to have a significant environmental effect.
- EU Habitats Directive (1992/43/EEC): Outlines Europe's nature conservation policy and requires measures to be taken to maintain or restore natural habitats taking account of economic, social and cultural requirements.
- The Local Democracy, Economic Development and Construction Act 2009: Promotes public involvement in relation to local authorities.

2.3 National policy, plans and strategies

National Planning Policy Framework (2012)

2.3.1 The National Planning Policy Framework[6] (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. Section 10 of the NPPF sets out the approach for meeting the challenge of climate change, flooding and coastal change and highlights the role that Local Planning Authorities such as the have to ensure that inappropriate development in areas at risk of flooding is avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

2.3.2 The NPPF replaces Planning Policy Statement 25: Development and Flood Risk[7] (PPS25). The principles of PPS25 still form part of the new NPPF. The NPPF is supplemented by a Technical Guide, which elaborates on how the policies of the NPPF should be applied. At the time of issue of this strategy, the PPS25 Practice Guide[8] had not been revoked.

[6] CLG (March 2012) National Planning Policy Framework
[7] CLG (December 2006, revised March 2010) Planning Policy Statement 25: Development and Flood Risk
[8] CLG (December 2009) Planning Policy Statement 25: Development and Flood Risk Practice Guide

National Flood and Coastal Erosion Risk Management Strategy for England (2011)

2.3.3 The FWMA states that the EA must 'develop, maintain, apply and monitor a strategy for flood and coastal erosion risk management in England' as part of its strategic overview role for flood and coastal erosion risk management. In response to this, the EA has developed the National Strategy jointly with DEFRA to ensure that it reflects government policy.

2.3.4 The National Strategy[9] was published in 2011 and sets out strategic aims and objectives for managing flood and coastal erosion risks and the measures proposed to achieve them. As required by the FWMA, Medway Council has sought to ensure that the strategy is consistent with the approach and guiding principles that have been set out in the National Strategy.

2.4 Local policy, plans and strategies

Medway Council Plan (2013 – 2015)

2.4.1 The Medway Council Plan is a business plan for the next two years. It sets out how the council will ensure that they provide the best possible services to residents. The strategy directly contributes to three of the five priority areas:

- Safe, clean and green Medway.
- Everybody travelling easily around Medway.
- Everyone benefiting from the area's regeneration.

2.4.2 Two core values set out the principles of how Medway will work to deliver these priorities.

- Putting customers at the centre of everything we do.
- Giving value for money.

Sustainable Community Strategy 2010 – 2026

2.4.3 The Sustainable Community Strategy is the overarching strategy for Medway and sets out the long-term vision and key ambitions for Medway and the priorities to deliver that vision. It sits alongside the Local Development Framework, which is the key spatial plan for Medway, guiding development within Medway to 2026. The strategy contributes towards the following ambitions and principles included within the Sustainable Community Strategy.

[9] Environment Agency, Defra (2011) Understanding the risks, empowering communities, building resilience. The national flood and coastal erosion risk management strategy for England.

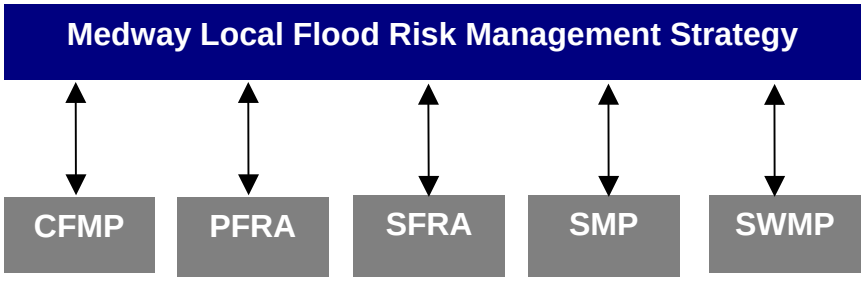
2.4.4 Ambitions:

- Medway to have a safe and high quality environment.

2.4.5 Principles:

- Sustainability: Will our actions work for tomorrow as well as today?
- Fairness: Do our actions take account of all sections of society, ensuring that everyone benefits from the regeneration of Medway?
- Self-help: Will our actions encourage people to take responsibility themselves to make things better?

2.4.6 The increased focus on flood risk over recent years is an important element of adaptation to climate change. It is important that this local strategy is not viewed as an isolated document, but one that connects with other strategic regional and local plans which are discussed in more detail below.



North Kent Rivers Catchment Flood Management Plan (CFMP) (December 2009)

2.4.7 The North Kent Rivers CFMP was published by the EA in 2009 and sets out policies for the sustainable management of flood risk over the long term (50 to 100 years) taking climate change into account. More detailed flood risk management strategies for individual rivers or sections of river sit under specific sub areas and policy units.

2.4.8 The CFMP emphasises the role of the floodplain as an important asset for the management of flood risk, the opportunities provided by new development and regeneration to manage risk, and the need to re-create river corridors so that rivers can flow and flood more naturally.

2.4.9 The CFMP will be periodically reviewed, approximately five years from when it was published, to ensure that it continues to reflect any changes in the catchment.

Medway Council Preliminary Flood Risk Assessment (PFRA) (September 2011)

2.4.10 In accordance with the requirements of the FRR 2009, Medway Council prepared a Preliminary Flood Risk Assessment (PFRA) in 2011. The PFRA contains information regarding past and future (potential) floods from local sources of flooding, which principally includes surface water, groundwater and ordinary watercourses.

2.4.11 In order to ensure a consistent national approach, DEFRA identified significance thresholds to be used for defining flood risk areas. The methodology is based on using national flood risk information to identify 1km squares where local flood risk is considered to be an issue. Where a cluster of grid squares leads to an area where flood risk is more concentrated and over 30,000 people are predicted to be at risk of flooding, this area has been identified as an 'Indicative Flood Risk Area'.

2.4.12 Of ten national Indicative Flood Risk Areas, one falls within Medway Council's administrative boundary. The PFRA provided an opportunity for Medway Council to contest the Indicative Flood Risk Area. The PFRA identified that while there is a potential risk of surface water flooding causing 'significant harmful consequences', limitations with the data available at the time of writing the PFRA provided insufficient evidence for Medway Council to contest the Indicative Flood Risk Area. Detailed surface water modelling undertaken as part of Surface Water Management Plan (SWMP) would present a more accurate picture of surface water flood risk in Medway.

Medway Council Strategic Flood Risk Assessment (SFRA) (August 2006)

2.4.13 A Strategic Flood Risk Assessment[10] (SFRA) for Medway was prepared in August 2006 by Mott Macdonald consultants. The SFRA included hydraulic modelling of tidal flood defence overtopping throughout the study area. Detailed mapping was provided presenting the flood depth and hazard ratings associated with different tidal flooding scenarios.

2.4.14 The SFRA provides a detailed assessment of the risk associated with tidal flooding, however there is little consideration of local sources of flooding, which are of importance to this strategy.

Medway Council Strategic Flood Risk Assessment Addendum (February 2011)

2.4.15 The original SFRA was completed prior to the issue of Planning Policy Statement 25 (PPS25; CLG December 2006) and as a result some of the policy implications required revision when PPS25 was published.

2.4.16 In addition, following the completion of the original SFRA, Mott Macdonald undertook a revised 2D tidal modelling exercise of the Lower Medway on behalf of the Environment Agency. This study was completed in 2007 and included the updated extreme water level information including climate change increases as set out in PPS25.

2.4.17 An addendum[11] to the original SFRA was prepared by Scott Wilson in 2011 to take account of updated hydraulic modelling information and the publication of PPS25.

[10] Mott Macdonald (August 2006) Medway Council Strategic Flood Risk Assessment
[11] Scott Wilson (2011) Addendum to the Medway Council Strategic Flood Risk Assessment

Medway Flood Defence Strategy: High Level Appraisal of Potential Solutions (February 2011)

2.4.18 This study was commissioned to determine the standard of protection and condition of the existing flood defence infrastructure in Medway to inform development and investment decisions. This included an economic analysis to estimate the likely damage costs attributed to flood events on a flood cell basis.

2.4.19 Potential flood risk management options were appraised in order to raise the standard of defence throughout Medway.

2.4.20 Medway Council is currently considering whether a Supplementary Planning Document should be prepared based in part on the revised SFRA and the High Level Appraisal to inform a strategic planning approach to the provision of new flood infrastructure.

Medway Estuary and Swale Shoreline Management Plan (SMP) (August 2010)

2.4.21 The SMP was published in 2010 by the Environment Agency. It provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address the risks in a sustainable manner with respect to people and to the developed, historic and natural environment.

Medway Council Surface Water Management Plan (SWMP) – forthcoming.

2.4.22 A SWMP is a plan, which outlines the preferred surface water management strategy in a given location. Medway Council will develop their SWMP in conjunction with other Risk Management Authorities who are responsible for surface water management and drainage in their area. Partners will work together to understand the causes and effects of surface water flooding and agree the most cost effective way of managing surface water flood risk for the long term. The key element to the SWMP will be the action plan which will influence future capital investment, drainage maintenance, public engagement and understanding, land use planning, emergency planning and future developments.

2.4.23 The data and actions and associated policy interventions will need to feed directly into the operational level of the council across many departments, in particular to special and emergency planning policies and designations and into the management of local authority controlled land.

2.5 Scrutiny and review of the strategy

Regeneration, Community and Culture

2.5.1 The Regeneration, Community and Culture Overview and Scrutiny Committee are the relevant scrutiny committee for flood and coastal erosion risk management. It plays a key role in developing and reviewing policy and holding Cabinet to account through a facility to call-in cabinet decisions for review or undertaking pre-decision scrutiny. It represents one of the most important ways in which Councillors can influence council policy and champion their constituents.

2.5.2 The FWMA 2010 amends the Local Government Act 2000 to include arrangements to review and scrutinise the flood management and coastal erosion risk management functions of RMA's, which may affect the Local Authorities area.

2.5.3 An annual report, agreed with all relevant RMA's, which provides information about performance and progress over the last financial year and plans for the upcoming financial year will be provided to the Overview and Scrutiny committee in April every year where there are plans for structural measures requiring funding.

Regional Flood and Coastal Committees (Southern Regional Flood and Coastal Committee).

2.5.4 Regional Flood and Coastal Committees scrutinise the Environment Agency's work. Medway is the Southern Region Regional Flood and Coastal Committee and has one Member on the committee from a total membership of 14. The committee is also responsible for administering the local levy, which is a fund paid into by each authority in the region according to the number of Band D properties in the authority. The local levy is described in Section 7.3.

3. Overview of Local Flooding in Medway

3.1 Overview

3.1.1 Part 1, Article 2, Section 9 Sub-section 4g of the FWMA states that the Strategy must specify 'the assessment of local flood risk for the purpose of the strategy'. This Section provides an overview of local flood risk across Medway based upon previously completed studies and new flood risk information generated specifically to inform the strategy.

3.2 Historical records

3.2.1 Over the last few years, Medway Council has maintained records of flooding events that have occurred within their administrative area. These are typically based on reports of flooding made by members of the public or identified by the responsive maintenance wardens in the Highways department. To date, the type of information captured typically includes the following fields:

- Date
- Address
- Incident type (burst water main, highway flooding, sewer flooding)
- Damage caused / clean up time
- Other relevant information from the informant

3.2.2 The FWMA places a duty on LLFAs to investigate and record significant flood events. As a result, it will be necessary for Medway Council to establish a formal method of flood incident recording within the council and make arrangements for the records to be captured and reviewed to enable identification of significant flood events. This is addressed further in Section 3.4.

3.2.3 In addition to records held by Medway Council, Southern Water also hold records of sewer flooding. Both these historic flooding datasets have been mapped in Figure 3.1.

3.3 Surface water (pluvial) flooding

3.3.1 Surface water flooding (also referred to as pluvial flooding) is caused as a result of high intensity rainfall over a long or short duration. Water, unable to enter into local drainage systems quickly enough, flows over the surface of the ground and ponds in low lying areas before entering watercourses or sewers as their capacity allows. Surface water flooding may

be exacerbated when receiving watercourses are full to capacity or where there are local issues with the drainage network including blockage or lack of gullies etc.

3.3.2 No single organisation has overall responsibility for surface water flooding, with different aspects of the drainage system falling to either The Highway Authority (in this case Medway Council), Southern Water, riparian owners and the Highways Agency for main routes (including the M2).

3.3.3 In order to develop local understanding of the nature of surface water flood risk across the study area, pluvial modelling has been undertaken across the entire administrative area for three annual probability rainfall events using the industry standard modelling package TuFLOW.

3.3.4 Rainfall profiles were estimated using the industry standard ReFH (Revitalised Flood Hydrograph) approach for the following annual probability rainfall events.

- 3.3% AEP (1 in 30 year)
- 1% AEP (1 in 100 year) plus climate change (+30%)
- 0.5% AEP (1 in 200 year)

3.3.5 The analysis of the 0.5% AEP event represents a worst case scenario to enable the council to ensure preparedness should such an event occur and to better understand the extent of those risks across the administrative area.

3.3.6 The full methodology and outputs for the pluvial modelling are presented in Technical Appendix 1: Pluvial Modelling Methodology[12]. Maximum flood depth mapping from the modelling is presented in Figures 3.1 to 3.3.

3.3.7 The PRFA estimated that 41,000 properties (of which approximately 35,700 are residential properties) would be at risk of surface water flooding. The pluvial modelling undertaken estimated that 24,300 properties are at risk (of which 14,200 are residential), representing a significant reduction due to the model refinements. Both of these estimates are based on the 0.5 % worst-case scenario.

3.3.8 Prior to approving the outputs of the hydraulic modelling, the results were verified against historic records of flooding. These provided a good correlation and a useful comparison from which to measure surface water flood risk in Medway. The historic records indicate that on average there have been three counts of internal flooding of property per year in Medway.

3.3.9 It is recognised that there remains uncertainty associated with the derivation of the estimates and therefore may still overestimate the risk of flooding from this source. To improve our understanding of surface water flood risks (and other sources of flooding), a Surface Water Management Plan will be undertaken in those areas in order to establish more accurate estimates and to identify Critical Drainage Areas.

3.3.10 Areas for inclusion in the SWMP will include those which have been identified as high risk by the modelling and areas where there are records of historic flooding. This includes but is not necessarily limited to the urban centres of Chatham, Rochester and Strood, as well as rural areas such as Stoke where there is a known problem associated with surface water flooding.

[12] Capita Symonds / URS (October 2013) Medway Council LFRMS Technical Appendix 1 Pluvial Modelling Methodology DRAFT

Figure 3.1 Pluvial Flooding Maximum Flood Depth 3.3% AEP (extract from Technical Appendix 1)

(This figure has been provided as a separate file:
MedwayCouncil-LocalFloodRiskManagementStrategy_Fig3.1_DepthMap_0030yr_001.pdf)

Figure 3.2 Pluvial Flooding Maximum Flood Depth 1% AEP including climate change (extract from Technical Appendix 1)

(This figure has been provided as a separate file:

MedwayCouncil-LocalFloodRiskManagementStrategy_Fig3.2_DepthMap_0100yrCC_001.pdf)

Figure 3.3 Pluvial Flooding Maximum Flood Depth 0.5% AEP (extract from Technical Appendix 1)

(This figure has been provided as a separate file:
MedwayCouncil-LocalFloodRiskManagementStrategy_Fig3.3_DepthMap_0200yr_001.pdf)

Figure 3.4 Areas susceptible to groundwater flooding (extract from Technical Appendix 2)

(This figure has been provided as a separate file:
MedwayCouncil-LocalFloodRiskManagementStrategy_Fig3.4_GroundwaterFlooding_001.pdf)

3.4 Groundwater flooding

3.4.1 Groundwater flooding occurs as a result of water rising up from an underlying aquifer. This tends to occur after much longer periods of sustained rainfall, and the areas at most risk are often low-lying where the water table is likely to be at shallow depth. Groundwater flooding is known to occur in areas underlain by principal aquifers, although increasingly it is also being associated with more localised floodplain sands and gravels.

3.4.2 Groundwater flooding tends to occur sporadically in both location and time, and tends to last longer than fluvial, pluvial or sewer flooding. Basements and tunnels can flood, buried services may be damaged, and storm sewers may become ineffective, exacerbating the risk of surface water flooding. Groundwater flooding can also lead to the inundation of farmland, roads, commercial, residential and amenity areas.

3.4.3 It is also important to consider the impact of groundwater level conditions on other types of flooding e.g. fluvial, surface water and sewer. High groundwater level conditions may not lead to widespread groundwater flooding. However, they have the potential to exacerbate the risk of surface water and fluvial flooding by reducing rainfall infiltration capacity, and to increase the risk of sewer flooding through sewer / groundwater interactions.

3.4.4 The need to improve the management of groundwater flood risk in the UK was identified through Defra's Making Space for Water strategy[13]. In order to develop local understanding of the nature of flood risk across the study area an assessment of the susceptibility of the area to groundwater flooding was undertaken[14]. This was a desk study based assessment using widely available sources of information as outlined in Technical Appendix 2 Groundwater Assessment.

3.4.5 To assist in the assessment of susceptibility to groundwater flooding conceptual models of the local geology and hydrogeological situation were developed. Based on this information likely groundwater flooding mechanisms were identified which were verified against available historical records of potential groundwater flooding.

3.4.6 This process, in tandem with a review of British Geological Survey mapping on groundwater flooding susceptibility enabled identification of those areas within Medway susceptible to groundwater flooding.

[13] Defra (February 2005) Making Space for Water
[14] Capita Symonds / URS (October 2013) Medway Council LFRMS Technical Appendix 2 Assessment of Susceptibility to Groundwater Flooding (DRAFT).

3.4.7 The conclusion of the assessment is the identification of the southern half of Medway's administrative area as having a degree of susceptibility to groundwater flooding due to the presence of the Chalk and Thanet Sands formations. The assessment also concludes that areas of Hoo St Werburgh and Allhallows may also be at risk from perched groundwater within head and River Terrace deposits in these areas.

3.5 Ordinary watercourse flooding

3.5.1 Ordinary watercourse flooding includes flooding from small open channels and culverted urban watercourses. The Detailed River Network (DRN) has been provided by the Environment Agency and enables identification of non-Main Rivers within Medway. In the southern half of Medway, there are few known ordinary watercourses; it is likely that some previously open channel watercourses have been entirely culverted and are now incorporated into the Southern Water sewer network as storm relief sewers. However, in the north Medway, there are extensive networks of small channels and ditches that cover the low-lying areas and drain to the tidal estuary.

3.5.2 The capacity and condition of ordinary watercourses is essential to the operation of the local drainage system and culverted watercourses are especially vulnerable to future flood risk. However, as noted in the Surface Water Management Plan (SWMP) Guidance[15] data on ordinary watercourses is frequently very sparse.

3.5.3 The Environment Agency has statutory and supervisory powers with regard to flooding from designated main rivers. However, the responsibility for maintenance of small open channels and culverted urban watercourses which are not designated as main river falls to Medway Council, Medway Internal Drainage Board and riparian owners who own land on either bank i.e. Medway Council is only responsible for ordinary watercourses where land on either bank is in council ownership, or where historical agreements have been made.

3.5.4 Changes to ordinary watercourse consenting have been made by the FWMA. In particular paragraph 32 (principally) of Schedule 2 of the FWMA amends Section 23 of the Land Drainage Act 1991[16]. Local Authorities will now lead on ordinary watercourse consenting and enforcement unless it is in an Internal Drainage District where Internal Drainage Boards (IDBs) will retain their existing powers. The Land Drainage Act 1991 makes provisions for ordinary watercourse regulation undertaken by Local Authorities.

[15] Defra (March 2010) Surface Water Management Plan Technical Guidance
[16] HMSO and the Queen's Printer of Acts of Parliament (1991) Land Drainage Act

3.5.5 One of the known areas of ordinary watercourse flooding in Medway is that associated with the ordinary watercourse that passes along the rear of properties on the southern edge of Hoo St Werburgh. This watercourse has been culverted at various points along its length as it passes through gardens of private properties. This culverting may have led to a reduction in the capacity of the channel, which has historically caused localised flooding of gardens and properties. This has been exacerbated in the past by fly tipping of garden waste into the watercourse.

3.6 Climate Change

3.6.1 The world's weather and climate is continually changing, resulting in both long and short term variations to weather patterns. In the UK, evidence suggests a shift towards generally wetter winters and a greater proportion of precipitation to fall as heavy rainfall events. The UK has a long-term framework for building the UK's ability to adapt to a changing climate as outlined in the Climate Change Act 2008.

3.6.2 The strategy has included pluvial modelling. In order to provide a robust evidence base, an allowance for climate change over the next 100 years has been added to rainfall boundaries included in the pluvial modelling in accordance with the Technical Guidance to the NPPF (an increase of 30%).

3.7 Flood Incident Reporting

3.7.1 The FWMA places a duty on LLFAs to investigate flood incidents from surface water, groundwater and ordinary watercourses, where it considers it 'necessary and appropriate'. In order to assist with these requirements, a threshold for undertaking a flood incident report has been developed by Medway Council as follows:

3.7.2 A formal flood incident report will be carried out where one or more of the following criteria are met (supported by hydraulic modelling where appropriate):

- ≥ 1 report of flooding of the interior of a domestic property from 1 event;
- ≥ 1 report of flooding of the interior of a business premises from 1 event;
- ≥ 1 report of external flooding of five or more properties;
- ≥ 1 report of flooding of critical infrastructure;

3.7.3 Flooding causing a transport link to be impassable for a significant period (significant being as Table 1 of the UKRLG code of Practice for Highways Maintenance)

- ≥ 15 reports of flooding within 50m of the receptor in the past 3 years

4. Managing Flood Risk in Medway

4.1 Overview

4.1.1 Part 1, Article 2, Section 9 Sub-section 4a of the FWMA states that a local strategy must specify 'the Risk Management Authorities in the authority's area'. Under Sub-section 4b it also states that a strategy must specify 'the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area'.

4.2 Risk Management Authorities (RMAs)

4.2.1 In accordance with the Flood and Water Management Act, a RMA may include the Environment Agency, LLFA, and District Council for an area for which there is no Unitary Authority, an Internal Drainage Board, a water company and a Highway Authority.

4.2.2 The following RMAs have therefore been identified across Medway Council's administrative area:

- Medway Council (LLFA)
- Environment Agency
- Medway Council as the Highways Authority
- Lower Medway Internal Drainage Board (IDB)
- Southern Water

4.2.3 Though not formally designated as RMAs by the FWMA, the following groups or organisations have roles and functions in flood risk management.

- Regional Flood and Coastal Committee (RFCC).
- SE7 Regional Consortium.
- 11 Parish Councils.
- Network Rail.
- Kent Resilience Forum.
- Kent Fire and Rescue Service.
- Land owners and land managers.
- South East Water.
- Rochester Bridge Trust.
- The public.

4.3 Roles and responsibilities

4.3.1 Information included in Appendix 4 sets out some of the key duties, powers, roles and responsibilities of each of the RMAs. It should be noted that these tables are not exhaustive, and the source documents and legislation should always be referred back to for further information and clarification.

4.4 Information and Skill Sharing

4.4.1 It is essential that RMAs work together to achieve the functions set out in recent legislation. Effective sharing of information between RMAs can go a long way towards this aim.

4.4.2 Section 14 of the FWMA gives Medway Council, as the LLFA, the power to request information in connection with its flood risk management functions. It also states that information requested must be provided in the manner and within the period specified in the request.

4.4.3 'Information' can cover any data, documents or facts recorded in any form and includes paper files, notes, reports, databases, spreadsheets, drawings and plans, photographs and videos, electronic documents, emails, etc. There is a vast amount of data, in these different forms, held by a number of different RMAs; the challenge will be identifying what information exists and where it is held. This process was initiated during the preparation of the PFRA when data was collected from different RMAs. This data has provided the overall evidence base of flood risk information, which will inform future flood risk management work.

4.5 Role of the public and businesses

4.5.1 Members of the public have an important role to play in the context of local flood risk management. In many cases, the council and other RMAs will be reliant on information from local residents and business owners in order to be able identify the mechanisms and impacts of flood events. It is important that this information is directed to the council and acted upon where appropriate to fulfil the requirements of the FMWA and thereby continue to assist in the management of local flood risk.

4.5.2 As well as informing the council of areas experiencing flooding, the public also have a role to play in finding out whether they are at risk, and if so, implementing flood risk management measures where they are responsible for protecting their properties. These may include good housekeeping measures such as the careful management of surface water from their gardens and hard standing surfaces, the maintenance of open watercourses and ditches associated with their properties or the installation of flood protection measures during flood warnings. The

Environment Agency's website (www.environment-agency.gov.uk) provides a comprehensive resource on preparing for flooding. The on-line information is supported by a number of information leaflets including:

4.5.3 'Living on the edge'[17] provides a useful guide to the rights and responsibilities of those who own land adjacent to main rivers and ordinary watercourses.

4.5.4 'Prepare your property for flooding[18]' is a guide for householders and small businesses on preparing for flooding.

4.5.5 In order for local residents to fulfil their responsibilities of reporting flood incidents to the council and undertaking management measures for their own properties and local areas, local groups of residents or property owners may consider establishing local partnerships or flood working groups to tackle flood risk issues together.

4.6 Role of developers

4.6.1 Developers have a vital role to play in delivering the outcomes of the strategy. Developers should take note of the information contained within the strategy and work collaboratively with the LLFA and other RMAs in Medway to assist the delivery of local flood risk management for the benefit of all who live or work in Medway.

[17] Environment Agency (2007) Living on the edge - a guide to the rights and responsibilities of riverside occupation. 3rd Edition.
[18] Environment Agency (2009) Prepare your property for flooding, A guide for householders and small businesses

5. Local Flood Risk Management Objectives

5.1 Overview

5.1.1 Part 1, Article 2, Section 9 Sub-section 4c of the FWMA states that a strategy must specify 'the objectives for managing local flood risk', (including any objectives included in the authority's flood risk management plan prepared in accordance with the FRR 2009).

5.2 Identification of Flood Risk Management objectives

5.2.1 In order to steer the development of local flood risk management objectives for Medway Council, a review of the objectives set out in the Environment Agency's overarching National Flood and Coastal Erosion Risk Management Strategy has been undertaken. In addition to the five national objectives, the National Strategy also sets out six high-level principles by which it suggests that decisions relating to flood risk management and the processes by which they are taken should be guided. These guiding principles are as follows:

- Community focus and partnership working.
- A catchment and coastal "cell" based approach.
- Sustainability.
- Proportionate, risk-based approaches.
- Multiple benefits.
- Beneficiaries should be encouraged to invest in risk management.

5.2.2 The local objectives for this strategy have been developed in line with the five strategic objectives and the six guiding principles set out in the National Strategy. A workshop was held with members of Medway Council to identify and capture flood risk management objectives. Representatives were invited from a range of departments to contribute to the development of the council's flood risk management objectives. These objectives are set out in Table 5.1.

5.2.3 The FWMA requires Medway Council to agree its measures with other RMAs and the public and therefore will be agreed following a period of consultation.

Table 5.1 Medway Council's flood risk management objectives

		Adherence of local objectives to National Strategy Guiding Principles					
	GP1 Community focus and partnership working GP2 A catchment and coastal "cell" based approach GP3 Sustainability GP4 Proportionate, risk-based approaches GP5 Multiple benefits GP6 Beneficiaries should be encouraged to invest in risk management	**1**	**2**	**3**	**4**	**5**	**6**
National Strategy Objective 1: Understand the risks *Understanding the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them.*							
1a	Medway Council will work with internal and external stakeholders to develop a collective understanding of local flood risk to enable successful local flood risk management.	■					
1b	Medway Council will monitor flood risk		■				
National Strategy Objective 2: Prevent inappropriate development *Avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing risks.*							
2a	Medway Council will ensure local policy is consistent with wider flood risk management policies and legislation at a national and regional level and provide clear advice on how to achieve these policies within Medway.			■			
2b	Medway Council will promote the use of SuDS in accordance with its forthcoming role as SuDS Advisory Body and the forthcoming Defra National Standards			■		■	
2c	Medway Council will take account of the cumulative effect of developments and climate change on the risk of flooding			■			

Adherence of local objectives to National Strategy Guiding Principles

		GP1 Community focus and partnership working GP2 A catchment and coastal "cell" based approach GP3 Sustainability GP4 Proportionate, risk-based approaches GP5 Multiple benefits GP6 Beneficiaries should be encouraged to invest in risk management	1	2	3	4	5	6
	throughout Medway.							
2d	Medway Council will seek to ensure that all development has a positive or nil effect on the risk of flooding to and arising from proposed development.							
National Strategy Objective 3: Manage the likelihood of flooding *Building, maintaining and improving flood and coastal erosion management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society.*								
3a	Medway Council will consider how future infrastructure improvements (e.g. highways, rail, public realm works) and/or changes could be used to deliver flood risk / surface water management benefits.							
3b	Medway Council will use flood risk information to implement a risk-based approach to capital investment decisions and maintenance programmes and activities.							
3c	Medway Council will give consideration to the economical, social and environmental benefits and limitations of flood risk management measures when making investment decisions.							
National Strategy Objective 4: Help people manage their own risk *Increasing public awareness of the risk that remains and engaging with people at risk to encourage them to take action to manage the risks that they face and to make their property more resilient.*								

Adherence of local objectives to National Strategy Guiding Principles

		GP1 Community focus and partnership working GP2 A catchment and coastal "cell" based approach GP3 Sustainability GP4 Proportionate, risk-based approaches GP5 Multiple benefits GP6 Beneficiaries should be encouraged to invest in risk management	1	2	3	4	5	6
4a	Medway Council will share information with respect to flood risk across Medway with all Risk Management Authorities and the public.							
4b	Medway Council will increase public awareness (property owners, developers) with respect to flood risk and responsibility for flood risk management.							
National Strategy Objective 5: Improve flood prediction, warning and post-flood recovery *Improving the detection, forecasting and issue of warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.*								
5a	Medway Council will use information on flood risk as a tool for flood prediction and warning.							
5b	Medway Council will ensure that emergency plans and responses to flood incidents in Medway are effective.							
5c	Medway Council will ensure that communities understand the risks and their role and our role during an emergency.							

6. Measures for Managing Flood Risk

6.1 Overview

6.1.1 Part 1, Article 2, Section 9 Sub-section 4d of the FWMA states that a local strategy must specify 'the measures proposed to achieve those objectives'. Section 4e goes on to state that a strategy must specify 'how and when the measures are expected to be implemented'.

6.2 Identification of Flood Risk Management measures

6.2.1 In order to identify appropriate measures to achieve the flood risk management objectives set by Medway Council, a second workshop event was held with council staff, representing a range of departments.

6.2.2 For each of the objectives, initial ideas for potential measures were identified for further consideration. These are presented in Table 6.1.

6.2.3 Medway Council are not yet in a position to confidently identify critical drainage areas or significant flood risk areas across the administrative area due to the quality of flood record datasets. As a result, it is considered that identification of structural measures for flood risk areas would be inappropriate at this time. This information will be provided at a later date in a Surface Water Management Plan (SWMP). The strategy instead focuses on non-structural measures that can be implemented, especially building up the baseline of historic flood records, to enable the robust identification of critical drainage areas / significant flood risk areas and associated structural measures over the coming years.

6.2.4 The FWMA requires Medway Council to agree its measures with other RMAs and the public. This will be agreed following a period of consultation.

6.2.5 The identification of structural measures required to deliver objectives identified in the strategy will be a deliverable of the SWMP. The SWMP will include a description of the approach adopted to assess these measures. The approach may include cost benefit analysis, and/or a prescribed scoring criteria etc. and will feed into future updates of the strategy.

6.2.6 Table 6.1 provides an overview of the flood risk management measures that have been identified by Medway Council along with the RMA best placed to lead on its implementation.

6.2.7 Table 6.1 also provides an indication of the timeframe by which the measures will be carried out and/or reviewed. These have been defined as:

- Short (1-2 years).
- Medium (2-5 years), i.e. within the lifetime of the strategy, and
- Long term (>5 years), to be carried forward for review in the next iteration of the strategy.

Table 6.1 Medway Council measures for local flood risk management

National Objectives	Local Objectives	Medway Council Measures	Responsible Organisation / Individual	Supporting Bodies	Funding Source	Timeframe for Implementation
1. Understand the risks	A. Medway Council will work with internal and external stakeholders to develop a collective understanding of local flood risk to enable successful local flood risk management.	i. Establish internal flood group. ii. Establish external flood group. iii. Establish processes for communication across flood working groups. Iiii Undertake Section 19 investigations on becoming aware of a flood event. v. Provide internal training to teams and individuals who can contribute towards flood risk management functions.	MC	EA, IDB, Southern Water	Defra grant	Short Term (< 2 years)
	B. Medway Council will monitor flood risk	i. Improved flood incident record collection to establish a record of flood incidents. ii. Establish a record of structures and features. iii. Undertake a Surface Water Management Plan.	MC	EA, IDB, Southern Water	Defra grant	Short Term (< 2 years) Short Term (< 2 years) Short / Medium Term
2. Prevent inappropriate development	A. Medway Council will ensure local planning policy is consistent with wider flood risk management policies and legislation at a national and regional level and provide clear advice on how to achieve those policies within Medway.	i. Undertake a review of current council policies relevant to flood risk management to ensure consistency with the most up to date plans and data. ii. Ensure that flood risk management infrastructure needs are taken account of in the Infrastructure Delivery Schedule that informs the Local Development Framework and Community Infrastructure Levy decisions.	MC	EA, IDB, Southern Water	Defra grant	Short Term (< 2 years) On-going
	B. Medway Council will promote the use of SuDS in accordance with it's forthcoming role as a SuDS Advisory Body and the forthcoming Defra National Standards	i. Establish a SuDS Approval Body within the council. ii. Develop local guidance for the adoption of SuDS within the Medway area to prepare for the forthcoming enactment of the SAB.	Defra, MC	Defra, EA		Dependant on Defra timescales, likely to be Short Term (< 2 years) Short Term (< 2 years)
	C. Medway Council will take account of the cumulative effects of developments and climate change on the risk of flooding throughout Medway	i. Develop a Supplementary Planning Document to address flood risk management from a planning context, with specific regard to the phased implementation of flood infrastructure in the area.	MC	EA		Medium Term (> 2 years but <5 years)
3. Manage the likelihood of flooding	A. Medway Council will require that all development have a positive or nil effect on the risk of flooding to and arising from proposed development.	i. Work with other RMA's via the planning process to achieve common goals to reduce flood risk.	MC	EA, IDB, Southern Water		On-going
	B. Medway Council will consider how future infrastructure improvements (e.g. highways, rail, public realm works) and/or changes could be used to deliver flood risk / surface water management benefits.	i. Design engineer to consider flood risk via consultation with flood risk officer, Highways Maintenance regime to consider flood risk ii. Identify opportunities to retrofit SuDS into existing developments.	MC	EA, IDB, SW		On-going
	C. Medway Council will use flood risk information to implement a risk-based approach to capital investment decisions and maintenance programmes and activities.	i. Use an Asset Register Management Database as a basis for informing risk based approach to capital investment decisions and maintenance programmes and activities led risk/conditions surveys against asset valuation.	MC			Short Term (< 2 years)

National Objectives	Local Objectives	Medway Council Measures	Responsible Organisation / Individual	Supporting Bodies	Funding Source	Timeframe for Implementation
	D. Medway Council will give consideration to the economical, social and environmental benefits and limitations of flood risk management measures when making investment decisions.	i. Use a benefit/cost options assessment method as the basis of determining investment decisions in flood risk management.				On-going
4. Help people manage their own risk	A. Medway Council will share information with respect to flood risk across Medway with all Risk Management Authorities and the public.	i. Web development to improve accessibility. ii. Consultation and engagement via external RMA flood group.	MC	EA, IDB, Southern Water	Defra Grant	Short Term (< 2 years)
	B. Medway Council will seek to increase public awareness (property owners, developers) with respect to flood risk and responsibility for flood risk management.	i. Engage with local communities regarding responsibilities for flood risk management (particularly land drainage consenting)	MC	EA, IDB, Southern Water	Defra Grant, Emergency Planning budget	Short Term (< 2 years)
5. Improve flood prediction, warning and post-flood recovery	A. Medway Council will use information on flood risk as a tool for flood prediction and warning.	i. Maintain flood risk and hazard mapping within the council	MC	EA	Defra Grant	Short Term (< 2 years)
	B. Medway Council will ensure that emergency plans and responses to flood incidents in Medway are effective	i. Review the current Medway Multi Agency Response Plan. Review and update where necessary call out engineers emergency operational procedures. Ensure that they both take account of latest data.	MC	EA	Defra Grant, Emergency planning budget	Short Term (< 2 years)
	C. Medway Council will ensure that communities understand the risks and their role and MC's role during an emergency	i. Consultation and engagement with the public to raise awareness of flood risk and local flooding issues and advise how they can reduce the consequences of flooding.	MC	EA	Defra Grant, Emergency planning budget	Short Term (< 2 years)

7. Funding Options

7.1 Overview

7.1.1 Part 1, Article 2, Section 9 Sub-section 4f of the FWMA states that the strategy must specify 'the costs and benefits of those measures, and how they are to be paid for'.

7.2 Costs and benefits

7.2.1 Structural measures required to meet objectives outlined in the strategy will be identified in the Medway SWMP. This will include a description of the approach adopted to assess these measures in terms of cost and benefit.

7.3 Funding

7.3.1 The effective practical implementation of flood risk management measures requires adequate resources both for the management and response activities of the LLFA as well as for capital projects. This section provides a summary of available forms of funding and seeks to assist with identifying any further actions that will be needed to ensure that particular funding alternatives are feasible.

7.3.2 Figure 7.1 identifies the various streams of funding open to RMAs which are discussed in turn in the following sections.

Funding to LLFA's through Area Based Grants

7.3.3 Funding for LLFA's to meet their new responsibilities has been allocated through Area Based Grants or local services support grants. The money is not ring fenced so individual LLFA's must decide how much of this grant to spend, subject to limits on overall budgets and the need for investment on other priorities.

7.3.4 The amount of money allocated to individual LLFAs varies based on the overall risk within the relevant area. This money has been made available to support Medway Council with its ongoing local flood risk management activities.

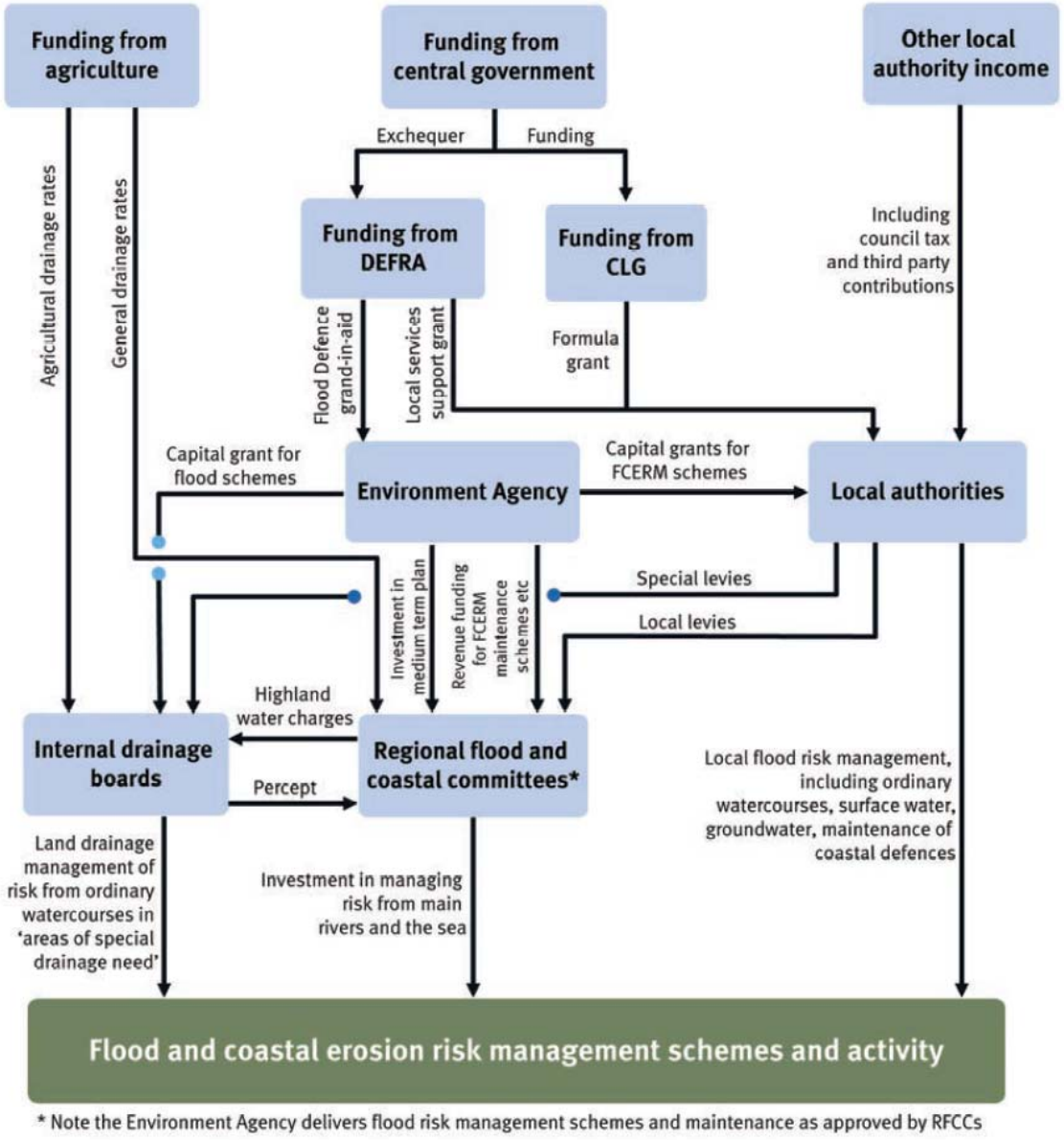


Figure 7.1 Funding Streams for Risk Management Authorities (Environment Agency, 2011)

Public Funding for Capital Schemes through 'Payment for Outcomes' and 'Flood Defence Grant in Aid' Schemes

7.3.5 The Pitt Review (Recommendation 24) recommended that the "Government should develop a scheme that allows and encourages local communities to invest in flood risk management measures". This recommendation is delivered by using the new 'Payment for Outcomes' approach, which came into force in April 2012. All schemes are now offered a fixed subsidy based on the benefits delivered when the outcomes are achieved with the aim to encourage communities to take more responsibility for the flood risk that they face. It also aims to deliver more benefit by encouraging total investment to increase beyond the levels that DEFRA alone

can afford. The new approach will see funding levels for each scheme provided by DEFRA through Flood Defence Grant in Aid (FDGIA) relating directly to benefits, in terms of the number of households protected, the damages being prevented plus other scheme benefits such as environmental benefits, amenity improvement, agricultural productivity and benefits to business. In addition to these elements, payment rates for protecting households in deprived areas will be higher so that schemes in these areas are more likely to be fully funded by the Government[19].

7.3.6 Under this system some schemes will receive complete funding if the benefits significantly outweigh the costs. For other schemes partial funding would be available. It is hoped that this approach would encourage people to find cheaper ways to achieve positive outcomes and/or find other funding mechanisms to pay the remaining cost of the scheme.

7.3.7 Figure 7.2 illustrates the 'Payment for Outcomes' approach and the importance of the local levy in fully funding flood defence and maintenance schemes.

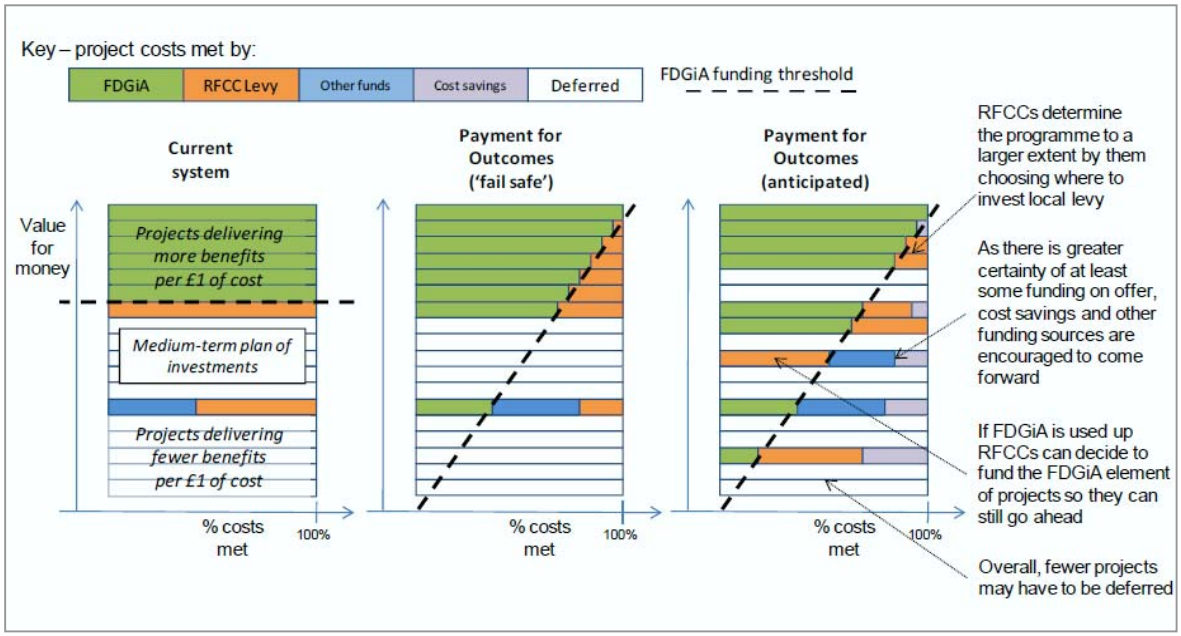


Figure 7.2 The Payment for Outcomes Approach and Importance of the Local Levy
Source: Defra Consultation Document (page 19)

Funding through the Community Infrastructure Levy

7.3.8 The Community Infrastructure Levy (CIL) came into force through the Community Infrastructure Regulations 2010 in April 2010 and provides LLFAs with an alternative source of potential funding for flood defence schemes. It allows local authorities to raise funds from new development in their area in order to pay for the impact that the development has on local

[19] For further information on how levels of depravation will be assessed, refer to the Index of Multiple Depravation commissioned by the Department for Communities and Local Government (www.imd.communities.gov.uk)

infrastructure. The levy is based on the concept that almost all development has some impact on infrastructure and services, so it is fair that development should contribute towards the cost of maintaining or upgrading local infrastructure.

7.3.9 The Community Infrastructure Levy must be levied in pounds per square metre of floor space arising from any chargeable development. The charge will be applied to the gross floor space of most new buildings or extensions to existing buildings.

7.3.10 Medway Council is in the process of undertaking work with a view to setting a charge for development within the area.

7.3.11 Local authorities are required to use this funding for infrastructure needed to support the development; it can be used to construct new infrastructure, increase the capacity of existing infrastructure or repair failing existing infrastructure. The Planning Act 2008 includes a broad definition of the infrastructure that can be covered by this scheme including transport, flood defences, schools, hospitals and parks.

Funding through the European Union

7.3.12 European Union funding is available through the 'Interreg' scheme from the European Regional Development Fund (ERDF).

Developer Contributions

7.3.13 Development may be liable for a charge under the Community Infrastructure Levy (CIL), as discussed in Section 7.3.8.

7.3.14 Section 106 of the Town and Country Planning Act 1990 allows an LPA to enter into an agreement with a landowner or developer in association with the granting of planning permission. A Section 106 agreement is used to address issues that are necessary to make a development acceptable, such as supporting the provision of services and infrastructure.

7.3.15 One of the recommendations of 'Making Space for Water' was that LPAs should make more use of Section 106 agreements to ensure that there is a strong planning policy to manage flood risk. This means that any flood risk, which is caused by, or increased by, new development, should be resolved and funded by the developer.

Local Fundraising

7.3.16 In addition to contributions from developers, another important funding mechanism will come from local fundraising from the local communities and businesses that stand to benefit from the proposed flood defence schemes. Fundraising may appear to be a daunting task but the best place to start is with those who stand to benefit from the project.

Other sources of funding

7.3.17 Defra is currently producing a good practice guide to support LPAs called 'Solutions for Joint Funding of Surface Water Schemes'. This project will explain the funding mechanisms and time cycles, approval processes of key partners and benefits of joint funding of local flood risk management.

8. Wider Environmental Objectives

8.1 Overview

8.1.1 Part 1, Article 2, Section 9 Sub-section 4i of the FWMA states that a local strategy must specify 'how the strategy contributes to the achievement of wider environmental objectives'.

8.1.2 In order to address this requirement, a review of relevant policy documents has been undertaken to identify environmental objectives of relevance to the study area. Subsequently, an assessment of which of Medway Council's flood risk management objectives (if any) contribute to each of these environmental objectives has been undertaken and justification provided. This process is presented in Table 8.1.

8.1.3 The European Directive 2001/42/EC was adopted in 2001 and transposed into English legislation by the Environment Assessment of Plans and Programmes Regulations in 2004. The purpose of the Directive is to increase the level of protection for the environment. It integrates environmental considerations into the preparation and adoption of plans and programmes with the view of promoting sustainable development.

8.1.4 The Directive requires a Strategic Environmental Assessment (SEA) to be carried out for all plans and programmes, which are subject to preparation and/or adoption, by an authority at national level, regional or local level. A SEA screening report has been undertaken to determine whether or not the contents of the strategy requires a SEA.

8.1.5 The screening exercise concludes that is it is unlikely that there will be any significant environmental effects arising from the objectives and measures included within the strategy and as such does not require a full SEA to be undertaken.

Table 8.1 Contribution of Medway Council flood risk management objectives to the achievement of wider environmental objectives

Source Document	Wider Environmental Objectives		Medway Council LFRMS Objectives												Comments
			1a	*1b*	*2a*	*2b*	*2c*	*3a*	*3b*	*3c*	*4a*	*4b*	*5a*	*5b*	
Regeneration, Communities and Culture Overview and Scrutiny Committee	*1*	Manage, protect, conserve and invest in our open spaces to create parks that can be enjoyed by all					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect open spaces from flood damage in the future; 3b. The use of non structural methods and/or SUDS can reduce the environmental impacts of flood risk measures, helping to conserve existing open spaces
	2	Reduce the carbon footprint and foster sustainable development in Medway			■				■						2a. The implementation of sustainable drainage techniques is a large part of wider policies such as the WFD and the FWMA and will help towards fostering sustainability in Medway; 3b. Sustainability goals could be reached by the use of SUDS that have both environmental and social benefits (e.g. Improved biodiversity and increased amenity etc) and also potential economic benefits (e.g. tourism)
Southern Water: Final Water Resources Management Plan	*3*	To protect and enhance terrestrial biodiversity including designated and other important habitats and species					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect important habitats from flood damage in the future; 3b. Flood risk management measures could both benefit and damage habitats/ecosystems. It is important that these factors are weighed up against each other to ensure the overall protection of the environment
	4	To protect and enhance aquatic biodiversity including designated and important habitats and species					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect important habitats from flood damage in the future; 3b. Flood risk management measures could both benefit and damage habitats/ecosystems. It is important that these factors are weighed up against each other to ensure the overall protection of the environment
	5	To minimise negative effects on local communities resulting from construction and operation of options					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect local communities from flood damage in the future; 3b. Detrimental social effects of a flood management strategy should be considered before any development is implemented. It should be noted that economic and environmental impacts are likely to have social impacts on the community as well
	6	To protect and enhance geological and geomorphologic diversity							■						3b. Flood risk management measures could both benefit and damage habitats/ecosystems. It is important that these factors are weighed up against each other to ensure the overall protection of the environment
	7	To maintain and enhance landscape character					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect landscape character from flood damage in the future; 3b. Flood risk management measures could both benefit and damage landscape character. It is important that these factors are weighed up against each other to ensure the overall protection of the environment
	8	To maintain and enhance salmonid and freshwater fisheries					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect fisheries from flood damage in the future; 3b. The safeguarding of fisheries through flood management is important to maintain local economic activity as well as reducing environmental impacts related to over fishing of other areas. Damage to fisheries resulting in economic losses would also have a social impact
	9	To reduce contamination and safeguard soil quality and quantity							■						3b. Consideration must be given to the environmental (and economic in agricultural areas) impacts on soil quality to ensure any proposed flood mitigation measures do not contribute to contamination or other negative soil properties.
	10	To protect and enhance groundwater quantity and quality							■						3b. Consideration must be given to the environmental and economic impacts on groundwater sources to ensure any proposed flood mitigation measures do not contribute negatively to water quality and quantity.
	11	To protect and enhance coastal water quality							■						3b. Consideration must be given to the environmental, social and economic impacts on coastal waters to ensure any proposed flood mitigation measures do not contribute negatively to water quality.
	12	To protect and enhance transitional surface water flows and quality							■						3b. Consideration must be given to the environmental, social and economic impacts on transitional surface waters to ensure any proposed flood mitigation measures do not contribute negatively to water quality.
	13	To protect and enhance surface water flows and quality							■						3b. Consideration must be given to the environmental, social and economic impacts on surface waters to ensure any proposed flood mitigation measures do not contribute negatively to water quality.

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	14	To minimise the risk of flooding taking account of climate change	■	■	■		■		■	■					1a. To be able to minimise the risk of flooding, it is first necessary to fully understand this risk so that it can be planned for and managed effectively; 1b. Climate change will increase the likelihood of flood events and must be considered when devising management strategies; 2a. A reduction in flood risk is a part of a number of wider policies (RBMPs, SMPs, RFRAs etc). Flood risk strategies should be consistent across all policies to ensure efficient risk management; 2c. Any development must not increase flood risk. In the case of flood risk management developments, they must not just simply transfer risk to other areas; 3b. The council must consider the environmental impacts of any flood risk measures and also any economic losses related to flooding if no management strategy is implemented; 3c. Development of infrastructure to double up as flood management features could mean reduction in flood risk could be achieved efficiently
	15	To maintain and enhance local air quality							■						3b. Flood mitigation measures that enhance green areas such as SUDS could help to maintain local air quality as a by-product
	16	To reduce greenhouse gas emissions							■						3b. Flood mitigation measures that enhance green areas such as SUDS could help to reduce or offset greenhouse gas emissions in Medway
	17	To reduce the generation of waste and encourage re-use and recycling of waste and use sustainably produced and local products							■						3b. Efficient use of raw materials in the implementation of flood management measures will have environmental benefits by reducing waste going to landfill. There is also potential for using recycled and/or locally sourced materials
	18	To protect and enhance sites and features of archaeological, historical and architectural interest					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect archaeological and historic features from flood damage in the future; 3b. Consideration must be given to the social and economic impacts on archaeological or historic features to ensure any proposed flood mitigation measures do not contribute negatively towards their preservation.
	19	To minimise adverse effects to other abstractors, rights of navigation and other commercial users of water bodies	■				■		■						1a. Cooperation with all stakeholders on flood risk management will help to minimise negative impacts upon all relevant parties 2c. Ensuring that new development does not increase current flood risk will help to minimise effects to other water users from flood damage in the future; 3b. Consideration should be given to the social and economic impacts that flood mitigation measures may have on other water users.
Medway Strategic Flood Risk Assessment	***20***	Quantity: minimise impermeable surfaces by good planning of development layout					■		■	■					2c. Positive effects on flooding can be achieved by reducing areas of impermeable surfaces to minimise runoff; 3b. Permeable surfaces allow for increased groundwater recharge and improve water quality by filtration resulting in reduced treatment costs. Permeable surfaces also reduce runoff that can wash pollutants from urban surfaces into watercourses; 3c. Future infrastructure improvements could be designed to incorporate permeable surfaces that can be used in place of non permeable materials such as paving in car parks etc to improve infiltration capacity and thus improve flood attenuation capabilities
	21	Quantity: control at source to reduce extra runoff					■		■	■					2c. New or re-developments can be designed to have more control over excess runoff so that overall flood risk decreases (or at least does not increase); 3b. Environmental benefits are offered by reduced runoff such as decreased erosion as well as less potential for pollutants to be washed into watercourses; 3c. Infrastructure can be designed specifically to incorporate ways of attenuating flows such as increasing infiltration or temporary storage
	22	Quantity: limit peak discharge to an agreed allowable runoff rate					■		■	■					2c. New or re-developments can be designed to have more control over excess runoff so that overall flood risk decreases (or at least does not increase); 3b. Environmental benefits are offered by reduced runoff such as decreased erosion as well as less potential for pollutants to be washed into watercourses; 3c. Infrastructure can be designed specifically to incorporate ways of attenuating flows such as increasing infiltration or temporary storage
	23	Quantity: attenuate excess water to an agreed storm return period (normally 1 in 100 year with allowances for climate change)		■			■		■	■					1b. Allowing for climate change ensures that any flood mitigation measures are sufficient for predicted future scenarios; 2c. New or re-developments can be designed to have more control over excess runoff so that overall flood risk decreases (or at least does not increase); 3b. Environmental benefits are offered by reduced runoff such as decreased erosion as well as less potential for pollutants to be washed into watercourses; 3c. Infrastructure can be designed specifically to incorporate ways of attenuating flows such as increasing infiltration or temporary storage

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			1a	1b	2a	2b	2c	3a	3b	3c	4a	4b	5a	5b	
	24	Quantity: low flow routes for frequent storms and first part of volume of rare storms through treatment stage				■	■		■	■					2b. Flow routes are rarely confined to a single development site and therefore need to be examined across a larger area; 2c. New or re-developments can be designed to have more control over runoff so that overall flood risk decreases (or at least does not increase); 3b. Environmental benefits are offered by reduced runoff such as decreased erosion as well as less potential for pollutants to be washed into watercourses; 3c. Infrastructure can be designed specifically to incorporate ways of routing flows away from important areas or features
	25	Quantity: high flow routes for extreme events with overland flood routes				■	■		■	■					2b. Flow routes are rarely confined to a single development site and therefore need to be examined across a larger area; 2c. New or re-developments can be designed to have more control over excess runoff so that overall flood risk decreases (or at least does not increase); 3b. Environmental benefits are offered by reduced runoff such as decreased erosion as well as less potential for pollutants to be washed into watercourses; 3c. Infrastructure can be designed specifically to incorporate ways of routing flows away from important areas or features
	26	Quality: prevent pollution by good planning of development layout and site management							■						3b. Flood mitigation measures that reduce pollution (such as SUDS) will have obvious environmental benefits. There is also potential for economic gains as water treatment does not need to be as rigorous
	27	Quality: treatment stages, usually a minimum of one for housing													
	28	Quality: appropriate technique to treat runoff from roads and pavements							■						3b. Flood mitigation measures such as SUDS that can be used to treat runoff will have obvious environmental benefits. There is also potential for economic gains as water treatment does not need to be as rigorous
	29	Quality: 'source control' preferred to control silt and pollution							■						3b. Consideration should be given to certain flood mitigation measures that are designed to offer environmental benefits by filtering the water of silt and pollutants to improve water quality. There is also potential for economic gains as water treatment does not need to be as rigorous
	30	Quality: 'first flush' treatment for all roads and pavements							■						3b. Consideration should be given to flood mitigation measures that are designed to offer environmental benefits by isolating the first flush from cleaner runoff which will help to reduce the majority of pollutants reaching watercourses untreated
	31	Amenity: Techniques should maximise opportunities for amenity including environmental and bio-diversity where possible							■						3b. Flood mitigation measures can be used to increase the amenity value of land and thus have social and environmental benefits (as well as potential economic benefits)
	32	Amenity: Techniques should protect amenity							■						3b. Consideration should be given to those flood mitigation measures that can be used in tandem with existing amenity features without having to remove them, therefore avoiding a loss of amenity that could lead to social, environmental and economic losses
Sustainable Community Strategy 2010-26	33	Medway to have a safe and high quality environment by 2026							■						3b. Consideration should be given to those flood mitigation measures that can have beneficial environment and social impacts by increasing biodiversity and amenity
	34	Increase user access through promoting the Hoo Peninsula and North Kent Marshes as a sustainable tourism initiative							■						3b. Consideration should be given to those flood mitigation measures that are able to increase amenity and environmental value of the area. This will help to attract tourism which in turn, will have economic benefits
	35	Increase user access through promoting greater awareness of the Medway and Thames estuary resources							■						3b. Social benefits derived from flood risk managements schemes (e.g. Improved amenity) can help to improve user access which should in turn help to raise awareness of the area
Medway Estuary and Swale Shoreline Management Plan	36	Prevent degradation of landscape quality and visual amenity from flooding and flood risk management works					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect landscapes from flood damage in the future; 3b. Consideration should be given to potential environmental and economic losses that could occur from degradation of the landscape as well as social impacts from a loss of amenity as a result of any proposed flood management strategies.
	37	Promote biodiversity opportunities and prevent loss/damage to habitats and associated species at various SSSIs, SNCIs, SPAs and UK BAP priority habitats from flooding and flood risk management works.					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect important habitats and conservation sites from flood damage in the future; 3b. Consideration should be given to those flood mitigation measures that can offer environmental benefits (e.g. enhanced biodiversity through improved water quality etc) while also protecting the fragile habitats from flood events. Any potential negative impacts of a flood mitigation scheme also need to be considered in the planning stages

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			1a	*1b*	*2a*	*2b*	*2c*	*3a*	*3b*	*3c*	*4a*	*4b*	*5a*	*5b*	
	38	Promote biodiversity opportunities and avoid net loss of coastal grazing marshes and intertidal habitat and associated species from coastal squeeze and flood risk management works.					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect important habitats from flood damage in the future; 3b. Consideration should be given to those flood mitigation measures that can offer environmental benefits (e.g. enhanced biodiversity through improved water quality etc) while also protecting the fragile habitats from flood events. Any potential negative impacts of a flood mitigation scheme also need to be considered in the planning stages
	39	Prevent loss/damage to heritage from flooding and flood risk management works or implement appropriate mitigation measures, including preservation of evidence by record. Seek opportunities to enhance features where appropriate					■		■						2c. Ensuring that new development does not increase current flood risk will help to protect heritage sites and features from flood damage in the future; 3b. Consideration should be given to the social and economic impacts on heritage sites to ensure any proposed flood mitigation measures do not contribute negatively towards their preservation.
	40	Prevent loss/damage to Conservation Areas and SAMs from flooding and flood risk management works. Seek opportunities to enhance features where appropriate.					■		■						2c. Ensuring that new development does not increase current flood risk will help to prevent damage to conservation areas and SAMs in the future; 3b. Consideration should be given to the environmental, social and economic impacts on conservation and SAM sites to ensure any proposed flood mitigation measures do not contribute negatively towards their preservation.
	41	Prevent loss/damage to shell fishery at Queensborough from flooding or flood risk management works.					■		■						2c. Ensuring that new development does not increase current flood risk will help to prevent damage to the fishery in the future; 3b. Consideration should be given to the environmental, social and economic impacts of flood defences on the shell fishery. Negative impacts (e.g. cost to protect the fishery from floods) should be weighed up against positive impacts such as avoiding the need for over fishing in other areas and economic and social gains from employment opportunities
	42	Prevent loss/damage/disruption to recreation and associated business from flooding and flood risk management works.					■		■						2c. Ensuring that new development does not increase current flood risk will help to prevent damage to recreation facilities in the future; 3b. Consideration should be given to the environmental, social and economic impacts of flood defences on recreation and associated businesses. Negative impacts (e.g. cost to protect recreation sites from floods) should be weighed up against positive impacts such as economic and social gains from maintaining access to recreation facilities
Medway Flood Defence Strategy: High Level Appraisal of Potential Solutions to Manage Flood Risk in the Urban Medway	***43***	To effectively realise Medway's role within the Thames Gateway and associated growth requirements primarily through effective physical regeneration, the reuse of previously developed land and the protection and enhancement of the area's many natural and heritage assets.				■			■						2b. Flood risk management strategies that are able to offer benefits across regeneration areas rather than just individual sites will help to achieve Medway's goal of effective physical regeneration; 3b. Consideration should be given to the use of brownfield sites for flood mitigation measures, which will benefit the environment by reducing the need for development of Greenfield sites as well as aiding the physical regeneration of the area. Flood risk management strategy may also make it possible to develop sites that were previously non viable development options due to flood risk, helping to meet growth requirements
	44	To develop Chatham as a city centre of regional significance with its role complemented by thriving and attractive traditional town centres in Strood, Rochester, Gillingham and Rainham together with a network of strong neighbourhood centres serving local communities.							■						3b. Consideration should be given to those flood mitigation measures that have the potential to improve local amenity, resulting in both social and economic benefits and thus helping Chatham and surrounding towns to develop. There may also be opportunities for environmental benefits depending on measures implemented
	45	To radically improve the quality of the townscape and public realm within the central urban area and along the urban waterfront.							■						3b. Consideration should be given to those flood mitigation measures that have the potential to improve local amenity, resulting in both social and economic benefits and thus helping to enhance the townscape. There may also be opportunities for environmental benefits depending on measures implemented
	46	To enhance the quality of life of local people through the promotion of healthier lifestyles and the provision of improved cultural, leisure and tourism facilities, including along the river Medway.							■						3b. Consideration should be given to the provision of green space by the use of SUDS as a flood mitigation measure, which would benefit local amenity and the environment, making outdoor space more attractive and therefore helping to promote healthier, more active lifestyles. It could also attract economic benefits from increased tourism

Source Document		Wider Environmental Objectives	Medway Council LFRMS Objectives												Comments
			1a	*1b*	*2a*	*2b*	*2c*	*3a*	*3b*	*3c*	*4a*	*4b*	*5a*	*5b*	
Environment and Front Line Services Overview and Scrutiny Committee	***47***	To ensure prudent use of land and other resources.							■						3b. Consideration should be given to the impacts of flood mitigation strategies upon land usage. Where possible, non-structural methods (e.g. improved planning and forecasting etc) should be implemented to reach flood management targets without the need for construction. Where structural measures are required, SUDS could be used to control flooding while maintaining the green nature of the land. They also require minimal raw materials in comparison to 'harder' more engineered techniques
	48	To reduce greenhouse gas emissions.		■					■						1a. Certain flood mitigation measures will have varying effects on the volumes of greenhouse gases produced (mainly from the construction phase) and as such, varying contributions towards climate change. This should be considered when producing a flood management policy; 3b. Climate change has a marked effect on the environment and any contributions to greenhouse gases from flood management schemes should be considered before implementation
	49	To minimise air quality impacts.							■						3b. The implementation of SUDS over 'harder' flood mitigation methods could help to maintain levels of green space in the area that would contribute towards improved air quality
	50	To conserve landscapes and townscapes.					■		■						2c. Ensuring that new development does not increase current flood risk will ensure that land/townscapes will remain protected in the future; 3b. Flood management measures can help to protect town and landscapes from flood damage and at the same time add extra social and environmental benefits by improving amenity and green space. Non-structural methods that do not impact on the land/townscape should also be considered (however this maybe a missed opportunity to make improvements rather than just avoiding degradation).
	51	To protect local amenity.	■				■		■						1a. Cooperation with all stakeholders will help to assess the views of what contributes to local amenity so that it can be effectively protected; 2c. Ensuring that new development does not increase current flood risk will ensure that amenity sites in Medway will remain protected in the future; 3b. Flood mitigation measures can be used to maintain the green nature of areas that add amenity value. Using the correct measures can not only protect local amenity but may also be able to improve it
	52	To minimise adverse effects on water quality.							■						3b. The use of SUDS can lead to environmental benefits from improved water quality by acting as a filtration treatment stage. This also has an economic benefit as water will not require as much treatment by water companies
	53	To minimise local transport impacts.							■	■					3b. Flood mitigation measures can be used to protect transport infrastructure leading to economic benefits derived from less damage and also from a reduction in loss of economic activity from people unable to travel due to flood waters; 3c. Reducing flood effects on transport networks could be realised by implementing flood measures as part of general infrastructure improvements works that could also benefit the wider area
	54	To provide employment opportunities.							■						3b. Social benefits could be derived from the creation of employment opportunities in the process of designing, constructing and maintaining flood mitigation measures
	55	To provide opportunities for public involvement / education.	■						■		■	■			1a. Engaging with all stakeholders including the public is key to ensuring the flood risk situation in the area is fully understood which is vital when designing a management strategy; 3b. During the planning stages, consultation with the public should be offered to help to assess the social impacts of flood management schemes on residents as well as any economic impacts to local businesses; 4a. Sharing of information between the council and the public is important for ensuring that the public feel involved and fully understand the proposals so that consultation is effective and efficient; 4b. Increasing public awareness of flood risk will help to educate the public so that they can take steps to better protect themselves in the event of a flood
	56	To minimise costs of waste management.													
	57	To ensure reliability of delivery.													
	58	To conform with waste policy.													

9. Review and Update

9.1 Overview

9.1.1 Part 1, Article 2, Section 9 Sub-section 4h of the FWMA requires LLFA to specify 'how and when the strategy will be reviewed' and where considered appropriate update their identified objectives and measures for flood risk management on a regular basis.

9.1.2 It is proposed that at a minimum, a review of the strategy should take place every six years to coincide with the requirement under the FRR 2009 to revise the PFRA and flood risk and hazard maps.

9.1.3 As a result of recent legislation and new roles and responsibilities of LLFA's, there are likely to be many changes to the way flood risk is managed. The strategy should be viewed as a dynamic strategy and some updates may need to be produced to recognise those changes.

9.1.4 Potential triggers include:

- Occurrence of a significant and widespread surface water flood event.
- Additional data or modelling becoming available which may alter the understanding of risk within the study area.
- If the outcome of investment decisions by partners is different to the preferred option which may require a revision to the action plan.

9.1.5 To complement the strategy, annual action plans will be produced in conjunction with other Risk Management Authorities and will include;

- A report of any changes and amendments deemed necessary
- An overview of the newest information available about local flood risk.
- Actions required to satisfy legislation within the forthcoming year
- Actions from Surface Water Management Plans
- Other flood risk management activities, which will be undertaken by Medway Risk Management Authorities in the current year.

9.1.6 The annual action plans will ensure that operations are joined up across the Risk Management Authorities and to ensure that decisions on resources are evidence based.

10. Further Reading and Information

10.1 The Environment Agency National Strategy

10.1.1 Understanding the risks, empowering communities, building resilience - The national flood and coastal risk management strategy for England is provided by the Environment Agency. It describes what needs to be done by all the risk management authorities to reduce the risk of flooding and coastal erosion, and to manage its consequences.

www.official-documents.gov.uk/document/other/9780108510366/9780108510366.asp

10.2 Environment Agency Area Flood Risk Management Strategies

10.2.1 The Environment Agency website contains details of Flood and Coastal Erosion Risk Management (FCERM) activities across the UK

10.2.2 View FCERM activity in your area:

www.environment-agency.gov.uk/homeandleisure/floods/31736.aspx

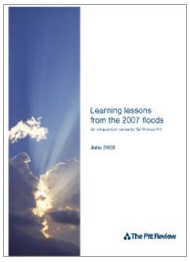
10.3 Future Funding of flood and Coastal Erosion Risk Management in England (Defra)

10.3.1 Visit Defra's website for more detailed information about the changes to funding:

www.defra.gov.uk/environment/flooding/funding-outcomes-insurance/

https://www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-change

10.4 The Pitt Review



10.4.1 This review of the 2007 floods by Sir Michael Pitt identified the lessons learned, focusing on the needs of people living and working in areas at risk. The review made 92 recommendations, focusing on six key aspects of flood risk management and has also led to a greater focus on surface water

flooding - a main cause of damage in the 2007 floods.

http://webarchive.nationalarchives.gov.uk/20100807034701/http:/archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html

10.5 Flooding in England

10.5.1 The Environment Agency's national assessment of flood risk for England sets out the current level of risk from rivers and the sea and what the Environment Agency is doing to manage it. Available to view or download from the Environment Agency website:

www.environment-agency.gov.uk/research/library/publications/108660.aspx

10.6 Investing for the future - Flood and coastal risk management in England

10.6.1 This report outlines the Environment Agency's long-term investment strategy for flood and coastal risk management. The latest climate change predictions indicate that flooding and coastal erosion are likely to increase in the future. The long-term investment strategy sets out the scale of the investment needed to meet this challenge over the next 25 years. Available to view or download from the Environment Agency website:

www.environment-agency.gov.uk/research/library/publications/108673.aspx

10.7 The Foresight Future Flooding Report

10.7.1 Foresight projects are in-depth studies commissioned by the Department for Business, Innovation and Skills, which look at major issues 20-80 years into the future. The Future Flooding Report was produced by the Flood and Coastal Defence project of the foresight programme. The report identifies the drivers of future flood risk and outlines how climate change will affect us in 30 to 100 years' time. The report is available to view or download from the Department for Business, Innovation and Skills website:

http://www.bis.gov.uk/foresight/our-work/projects/published-projects/flood-and-coastal-defence/project-outputs/volume-1

10.8 National Flood Forum

10.8.1 The National Flood Forum is a national charity dedicated to supporting and representing communities and individuals at risk of flooding. They provide information to enable communities to prepare for and deal with issues they face when flooding occurs. It brings together individuals and communities with those responsible for managing flood risk. It also provides learning and training programmes to agencies, authorities and communities, and highlights flood risk issues to government.

10.8.2 Visit the National Flood Forum website *www.floodforum.org.uk*

11. References

Bedford Group of Internal Drainage Boards (2012) Powers and Duties http://www.idbs.org.uk/legal-financial/powers-duties/ [accessed 27/7/12]

Cabinet Office (2008) Pitt Review - Learning Lessons from the 2007 Floods

CLG (March 2012) National Planning Policy Framework

CLG (March 2012) National Planning Policy Framework Technical Guidance

CLG (December 2006, revised March 2010) Planning Policy Statement 25: Development and Flood Risk

CLG (December 2009) Planning Policy Statement 25: Development and Flood Risk Practice Guide

Defra (March 2010) Surface Water Management Plan Technical Guidance.

Environment Agency (2007) Living on the edge – a guide to the rights and responsibilities of riverside occupation. 3rd Edition.

Flood Hazard Research Centre (2010) Multi-Coloured Manual

HMSO (1991) Land Drainage Act http://www.legislation.gov.uk/ukpga/1991/59/data.pdf [accessed 27/7/12]

HMSO and the Queen's Printer of Acts of Parliament (2010) Flood and Water Management Act http://www.legislation.gov.uk/ukpga/2010/29/pdfs/ukpga_20100029_en.pdf [accessed 27/7/12]

HMSO and the Queen's Printer of Acts of Parliament (2009) The Flood Risk Regulations http://www.legislation.gov.uk/uksi/2009/3042/pdfs/uksi_20093042_en.pdf [accessed 27/7/12]

Medway Council (September 2011) Preliminary Flood Risk Assessment

Mott MacDonald (August 2006) Medway Council Strategic Flood Risk Assessment (SFRA)

Scott Wilson (February 2011) Medway Council Strategic Flood Risk Assessment (SFRA) Addendum

UK Roads Liaison Group (UKRLG) Code of Practice for Highways Maintenance

HMSO and the Queen's Printer of Acts of Parliament (1991) Land Drainage Act

HMSO and the Queen's Printer of Acts of Parliament (2004) Civil Contingencies Act

Water Research Centre (WRC), 2006, Sewers for Adoption (6th Edition)

Glossary

Annual Exceedance Probability (AEP)

The average probability of a rainfall event occurring in any given year.

Catchment Flood Management Plan

A high-level planning strategy through which the EA works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.

Civil Contingencies Act

This Act delivers a single framework for civil protection in the UK. As part of the Act, Local Resilience Forums must put into place emergency plans for a range of circumstances including flooding.

Climate Change

When included as part of a flood event return period scenario, it means that that scenario includes the anticipated affects of climate change. For rainfall events, it incorporates a 30% increase. These climate change values are based upon information within the NPPF and PPS25 Practice Guide.

FCERM

Flood and Coastal Erosion Risk Management

Flood and Water Management Act (FWMA)

Part of the UK Government's response to Sir Michael Pitt's Report on the Summer 2007 floods, the aim of which is to clarify the legislative framework for managing surface water flood risk in England.

Flood Hazard

The derivation of flood hazard is based on the methodology in Flood Risks to people FD2320 using and is a function of flood depth, flow velocity and a debris factor.

Flood Map for Surface Water (FMfSW)

National surface water flood risk mapping published by the EA. This dataset provides an indication of the broad areas likely to be at risk of surface water flooding during the 0.5% and 3.3% AEP rainfall events.

Flood Risk Regulations 2009 (FRR 2009)

Transposition of the EU Floods Directive into UK law. The EU Floods Directive is a piece of European Community (EC) legislation to specifically address flood risk by prescribing a common framework for its measurement and management.

IDB

Internal Drainage Board

Lead Local Flood Authority (LLFA)

Lead Local Flood Authority in relation to an area in England means the unitary authority for the area, or if there is no unitary authority, the county council for the area (as defined by the FWMA).

LiDAR

Light Detection and Ranging data is obtained from an airborne survey technique that uses a laser to measure the distance between an aircraft and the ground surface.

Local Flood Risk Management Strategy (LFRMS)

A strategy for the management of local flood risk (that from surface water, groundwater and ordinary watercourses), to be developed, maintained, applied and monitored by the LLFA, as a duty under the FWMA.

Local Resilience Forum

A multi-agency forum, bringing together all the organisations that have a duty to cooperate under the Civil Contingencies Act, and those involved in responding to emergencies. They prepare emergency plans in a co-ordinated manner.

National Receptor Database (NRD)

A collection of risk receptors produced by the EA.

Ordinary Watercourse

All watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, IDBs

Ordnance Survey Master Map (OSMM)

OS Master Map is highly detailed mapping including individual buildings, roads and areas of land according to land use categories. The data is presented in GIS as polygon and line data.

Pitt Review

Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England.

Pluvial modelling

Flooding from water flowing over the surface of the ground; often occurs when the soil is saturated and natural drainage channels or artificial drainage systems have insufficient capacity to cope with additional flow.

Preliminary Flood Risk Assessment (PFRA)

A report required under the FRR 2009 for each LLFA administrative area, detailing information on past and future (potential) floods, and identifying Flood Risk Areas. LLFAs are only required to undertake a PFRA for local sources of flooding, which principally includes surface water, groundwater and ordinary watercourses.

Risk Management Authority (RMA)

Organisation that has a key role in flood and coastal erosion risk management as defined by the Flood and Water Management Act 2010. These include the EA, lead local flood authorities, district councils where there is no unitary authority, internal drainage boards, water companies and highways authorities.

Regional Flood and Coastal Committee (RFCC)

Established by the EA under the FWMA and takes the place of the Southern Regional Flood Defence Committee (RFDC). It brings together members appointed by LLFAs and independent members with relevant experience for the purpose of effective flood risk management.

Risk

In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring, and the consequence of the flood.

SEA

Strategic Environmental Assessment

Stakeholder

A person or organisation affected by the problem or solution, or interested in the problem or solution. They can be individuals or organisations, includes the public and communities.

Surface Water

Rainwater (including snow and other precipitation), which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.

TuFLOW

TuFLOW is a modelling package for simulating depth averaged 2D free-surface flows and is in widespread use in the UK and elsewhere for 2D inundation modelling.

Appendix 1 – Pluvial Modelling Methodology

Appendix 2 – Groundwater Assessment

Appendix 3 – Flood Risk Management Roles and Responsibilities

Roles and responsibilities of Medway Council

	Medway Council Flood Risk Management Functions
Flood and Water Management Act 2010	Medway Council has a duty to lead on local flood risk management, including establishing effective partnerships within their local authority as well as with other Risk Management Authorities such as the EA, Southern Water, Internal Drainage Boards, Highways Authority and neighbouring Local Authorities.
	Medway Council have a duty to investigate and record details of significant flood events within their area. This duty includes identifying which authorities have flood risk management functions and what their have done or intend to do with respect to the incident, notifying Risk Management Authorities where necessary and publishing the results of any investigations carried out. (FWMA Part 1 Section 19).
	Medway Council has a duty to develop, maintain, apply and monitor a strategy for local flood risk management in their area. The LLFA must publish a summary of its LFRMS (including guidance about the availability of relevant information). It may also issue guidance about the application of the LFRMS in its area. The LLFA must consult other Risk Management Authorities and the public who may be affected by the LFRMS. (FMWA Part 1 Section 9).
	Medway Council has a duty to maintain a register of structures or features that are likely to have a significant effect on flood risk in its area, including details on ownership and condition as a minimum. The register must be available for inspection. (FWMA Part 1 Section 21).
	Medway Council must aim to make a contribution towards the achievement of sustainable development when exercising a flood risk management function. (FWMA Part 1 Section 27).
	Medway Council has a duty to act as a Sustainable Drainage Systems (SuDS) Approving Body (SAB) for any new drainage system affecting more than one property. The SAB must approve, adopt and maintain any new SuDS within their area, which confirm to the National SuDS standards. (FWMA Part 1 Section This responsibility is not anticipated to commence before April 2013. (FWMA Schedule 3).

	Medway Council Flood Risk Management Functions
	Medway Council has a consenting and enforcement responsibility for ordinary watercourse regulation **for those ordinary watercourses that are not maintained by the Internal Drainage Board.**
	Medway Council has powers to request **a person to provide information in connection with the authority's flood and coastal erosion risk management functions. (FWMA Part 1 Section 14).**
	Medway Council has powers to designate structures and features that affect flooding in order to safeguard assets that are relied upon for flood risk management. Once a feature is designated, the owner must seek consent from the authority to alter, remove or replace it. (FWMA Schedule 1 Section 1).
	Medway Council have powers to undertake works to manage flood risk from surface water or groundwater, consistent with the LFRMS for their area. (FWMA Schedule 2 Section 29).
FRR 2009	Medway Council must revise the Preliminary Flood Risk Assessment (PFRA) at least every 6 years. The first review must be published by 22nd June 2017. (FRR Part 2 Section 10).
	Medway Council must prepare flood hazard and flood risk maps of relevant flood risk areas by 22nd June 2013 and revise these at least every 6 years. (FRR Part 3 Section 19).
	Medway Council must prepare a flood risk management plans for each flood risk area by 22nd June 2015 and revise these plans at least every 6 years. (FRR Part 4 Section 26).
	Medway Council has a duty to cooperate with other authorities exercising their functions under the FRR. (FRR Part 6 Section 35).
	Medway Council has powers to require information reasonably required in connection with their responsibilities as LLFA under the FRR from the authorities listed in Part 6 Section 36 Sub-section 3 of the FRR. (FRR Part 6 Section 36).

	Medway Council Flood Risk Management Functions
Civil Contingencies Act 2004[20]	Medway Council has a duty to: • assess the risk of an emergency occurring; • maintain plans for the purpose of ensuring that if an emergency occurs the person or body is able to continue to perform its functions; • arrange for the publication of all or part of assessments made and plans maintained for the purposes of preventing an emergency, reducing, controlling or mitigating the effects of an emergency, or enabling other action to be taken in connection with an emergency; and, • maintain arrangements to warn the public, and to provide information and advice to the public, if an emergency is likely to occur or has occurred. (Civil Contingencies Act 2004 Part 1 Section 2).
NPPF 2012	Medway Council, as LPA, should adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk, coastal change and water supply and demand considerations. (NPPF Paragraph 94).
	Medway Council's Local Plans should be supported by Strategic Flood Risk Assessment and should develop policies to manage flood risk from all sources, taking account of advice from the EA and other relevant flood risk management bodies. (NPPF Paragraph 100).

Roles and responsibilities of the Environment Agency

	Environment Agency Flood Risk Management Functions

[20] HMSO and the Queen's Printer of Acts of Parliament (2004) Civil Contingencies Act

	Environment Agency Flood Risk Management Functions
Flood and Water Management Act 2010	The EA has a duty to develop, maintain, apply and monitor a strategy for flood and coastal erosion risk management in England. The EA must publish a summary of its Strategy. It may also issue guidance about the application of the Strategy in its area. The EA must consult Risk Management Authorities and public on the National Strategy. (FMWA Part 1 Section 7).
	The EA must cooperate with other RMAs in the exercise of their flood risk management function and may share information with other RMAs for the purpose of discharging this duty. (FWMA Part 1 Section 13).
	The EA has powers to request a person to provide information in connection with the authority's flood and coastal erosion risk management functions. (FWMA Part 1 Section 14).
	The EA has powers to designate structures and features that affect flooding in order to safeguard assets that are relied upon for flood risk management. Once a feature is designated, the owner must seek consent from the authority to alter, remove or replace it. (FWMA Schedule 1 Section 1).
FRR 2009	The EA has a duty to prepare preliminary assessment maps and reports in relation to each river basin district with respect to flooding from the sea, main rivers and reservoirs. (FRR Part 2 Section 9).
	The EA has a duty to determine in relation to each river basin district whether there is a significant flood risk from the sea, main rivers or reservoirs. (FRR Part 2 Section 13).
	The EA has a duty to prepare in relation to each flood risk area; flood hazard and flood risk maps relating to flooding from the sea, main rivers and reservoirs. (FRR Part 3 Section 19).
	The EA has a duty to prepare flood risk management plans in relation to each flood risk area identified under Section 13. (FRR Part 4 Section 25).
	The EA has a duty to cooperate with other authorities exercising their functions under the FRR. (FRR Part 6 Section 35).
	The EA must comply with a request of Medway Council to provide information reasonably required in connection with their responsibilities as LLFA under the FRR. (FRR Part 6 Section 36).

	Environment Agency Flood Risk Management Functions
Civil Contingencies Act 2004	As a Category 1 Responder, the EA has a duty to: • assess the risk of an emergency occurring; • maintain plans for the purpose of ensuring that if an emergency occurs the person or body is able to continue to perform its functions; • arrange for the publication of all or part of assessments made and plans maintained for the purposes of preventing an emergency, reducing, controlling or mitigating the effects of an emergency, or enabling other action to be taken in connection with an emergency; and, • maintain arrangements to warn the public, and to provide information and advice to the public, if an emergency is likely to occur or has occurred. (Civil Contingencies Act 2004 Part 1 Section 2).

Roles and responsibilities of Southern Water

	Southern Water Flood Risk Management Functions
Water Industry Act 1991[21]	Southern Water has a duty to develop and maintain an efficient and economical system of water supply within its area and to ensure that all such arrangements have been made — • for providing supplies of water to premises in that area and for making such supplies available to persons who demand them; and • for maintaining, improving and extending the water undertaker's water mains and other pipes (Water Industry Act, 1991)
	Southern Water has a duty to provide and maintain a system of public sewers so that the areas for which they are responsible are effectually drained (Water Industry Act, 1991).

[21] HMSO and the Queen's Printer of Acts of Parliament (1991) Water Industry Act

	Southern Water Flood Risk Management Functions
	Southern Water must prepare, consult, publish and maintain a Water Resources Management Plan consisting of: • the water undertaker's estimate of the quantities of water required to meet their obligations; • the measures which the water undertaker intends to take or continue to manage and develop water resources so as to be able, and continue to be able, to meet its obligations; • the likely sequence and timing for implementing those measures; and • such other matters as the Secretary of State may specify in directions • A new plan must be produced every 5 years (Water Industry Act, 1991)
FWMA 2010	Southern Water must cooperate with other RMAs in the exercise of their flood risk management function and may share information with other RMAs for the purpose of discharging this duty. (FWMA Part 1 Section 13).
FRR 2009	Southern Water has a duty to cooperate with other authorities exercising their functions under the FRR. (FRR Part 6 Section 35).
	Southern Water must comply with a request of Medway Council to provide information reasonably required in connection with their responsibilities as LLFA under the FRR. (FRR Part 6 Section 36).

Roles and responsibilities of Lower Medway Internal Drainage Board

	Lower Medway IDB Flood Risk Management Functions
Land Drainage Act 1991	Medway IDB has a duty to exercise a general supervision over all matters relating to the drainage of land within their district.
	Medway IDB has powers to maintain existing works, that is to say, to cleanse, repair or otherwise maintain in a due state of efficiency any existing watercourse or drainage work.

	Lower Medway IDB Flood Risk Management Functions
	Medway IDB has powers to improve any existing works, that is to say, to deepen, widen, straighten or otherwise improve any existing watercourse or remove or alter mill dams, weirs or other obstructions to watercourses, or raise, widen or otherwise improve any existing drainage work.
	Medway IDB has powers to construct new works, that is to say, to make any new watercourse or drainage work or erect any machinery or do any other act required for the drainage of any land.
	If any person is liable to do any work in relation to any watercourse, bridge or drainage work (whether by way of repair, maintenance or otherwise); and fails to do the work, the drainage board concerned may serve a notice on that person requiring him to do the necessary work with all reasonable and proper despatch.
	Medway IDB may control development which affects watercourses within the Internal Drainage District by the use of application based consenting. • No person shall erect any mill dam, weir or other like obstruction to the flow of any ordinary watercourse or raise or otherwise alter any such obstruction; or erect any culvert that would be likely to affect the flow of any ordinary watercourse or alter any culvert in a manner that would be likely to affect any such flow, without the consent in writing of the drainage board concerned. • Where any ordinary watercourse is in such a condition that the proper flow of water is impeded, then, unless the condition is attributable to subsidence due to mining operations (including brine pumping), the drainage board or local authority concerned may require that the land or waterway owner remedy's that condition.
Flood and Water Management Act 2010	Medway IBD must cooperate with other RMAs in the exercise of their flood risk management function and may share information with other RMAs for the purpose of discharging this duty. (FWMA Part 1 Section 13).
	Medway IDB must aim to make a contribution towards the achievement of sustainable development when exercising a flood risk management function. (FWMA Part 1 Section 27).

	Lower Medway IDB Flood Risk Management Functions
	Medway IDB has powers to designate structures and features that affect flooding in order to safeguard assets that are relied upon for flood risk management. Once a feature is designated, the owner must seek consent from the authority to alter, remove or replace it. (FWMA Schedule 1 Section 1).
	Medway IDB has powers to undertake works to manage flood risk from surface water or groundwater, consistent with this strategy for their area. (FWMA Schedule 2 Section 29).
FRR 2009	Medway IDB has a duty to cooperate with other authorities exercising their functions under the FRR. (FRR Part 6 Section 35).
	Medway IDB must comply with a request of Medway Council to provide information reasonably required in connection with their responsibilities as LLFA under the FRR. (FRR Part 6 Section 36).