

# London Borough of Richmond upon Thames Local Flood Risk Management Strategy

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Strategic Environmental Assessment - Environment Report

August 2015



REVISION SCHEDULE					
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## 1 NON TECHNICAL SUMMARY

### Introduction

The London Borough of Richmond upon Thames ('Richmond Borough') is developing a Local Flood Risk Management Strategy (LFRMS) which is a statutory requirement under the Flood and Water Management Act 2010. The Strategy covers flood risk arising from surface water run-off, groundwater and 'ordinary' watercourses. Other sources of flooding, including 'main rivers' and tidal waters are the responsibility of the Environment Agency and other organisations. Richmond Council is working with the Environment Agency to ensure a consistent and integrated approach to flood risk.

Richmond Borough forms part of the South West London Flood Group, along with the five South West London Boroughs of Merton, Sutton, Croydon, Wandsworth and the Royal Borough of Kingston upon Thames. Each Borough is producing its own LFRMS and have opted to undertake a SEA for each of their Strategies.

The study area for this SEA consists of all areas within the Richmond Borough administrative boundary, as these areas are covered by the main LFRMS document. The SEA also takes into consideration the wider environment around and in close proximity to Richmond Borough, since environmental boundaries and margins do not necessarily follow man made administrative boundaries.

### Strategic Environmental Assessment

The aim of Strategic Environmental Assessment (SEA) is to ensure that wider environmental considerations on receptors such as biodiversity, human health, cultural heritage and infrastructure are integrated into the Strategy during its development. A Scoping Report has been produced to determine the state of the environment and which receptors are most affected. SEA objectives for measuring the environmental effect of the LFRMS have been developed.

This Environmental Report follows on from the scoping stage and documents the entire SEA process specifically for Richmond Borough, and documents the environmental effects of the LFRMS against the SEA objectives.

### The LFRMS

The London Borough of Richmond upon Thames LFRMS is an important document to help all stakeholders understand and manage flood risk within the Borough. The Strategy is a high level document which sets out Richmond Council's approach to limiting the impacts of local flooding across the Borough. It also promotes greater partnership working arrangements between those organisations with a responsibility for managing local flood risk.

The objectives of the Strategy are high level and the Strategy does not include proposals or detail of site specific measures (such as flood storage areas, or improved drainage management) that can be assessed within the SEA. Some of the objectives do have the potential to lead to the development of specific action plans or on the ground management activities at some point in the future.

### Assessment Results

In order to measure the likely environmental performance of the LFRMS, the SEA objectives have been used to assess the LFRMS objectives and the measures for flood risk management that are contained within the Strategy.

The assessment has shown that all of the LFRMS objectives will achieve positive impacts, with no damage to human health, the natural or built environment. The assessment results show that the Strategy is likely to provide benefits to all of the receptors listed under each SEA topic. Although the majority of the benefits achieved are likely to be indirect (i.e. not a direct result of the Strategy but an effect that occurs away from the original impact), the effects still remain positive.

The second assessment carried out was the assessment of a 'do nothing' scenario for each LFRMS objective. This assessment returned a negative environmental impact where doing nothing means to 'allow the environment to evolve without the LFRMS'. Doing nothing to improve the management of local flood risk does not strive to minimise the risk of local flooding to people, businesses and infrastructure. In time, the impacts of doing nothing are also likely to be exacerbated by the impacts of climate change.

There are a number of other flood risk management strategies and plans which could have cumulative effects (i.e. where several insignificant effects combined amount to a significant effect) with the London Borough of Richmond upon Thames LFRMS. In particular, where the LFRMS and other plans and strategies propose individual schemes there may be cumulative effects on watercourses, species, habitats, landscapes and historic assets. Therefore a third and final assessment was carried out to assess cumulative effects. The assessment predicted that both beneficial and adverse cumulative effects are likely, however, it is acknowledged that the lack of proposed on the ground measures and actions prevents a more accurate prediction of cumulative effects.

Overall, the LFRMS is considered to be beneficial for the environment and therefore no recommendations for the Strategy have been put forward.

A number of mitigation measures and a monitoring plan have been proposed. These will help to minimise and monitor any effects to the environment, when more detailed information on uncertainties, such location and types of proposed schemes, are known.

## 2 INTRODUCTION

### 2.1 Background

Local Flood Risk Management Strategies (LFRMSs or the 'Strategies'), are required to be produced by Lead Local Flood Authorities (LLFAs) under The Flood and Water Management Act (FWMA) (2010).

The FWMA and the Flood Risk Regulations 2009 gives Richmond Council, as the LLFA for Richmond Borough, a strategic role in overseeing the management of local flood risk within its area. As an LLFA, Richmond Council is required by the Act (2010) to produce a LFRMS ("Strategy") which must be maintained, applied and monitored. Whilst the Strategy was under preparation, a Strategic Environmental Assessment (SEA) was undertaken.

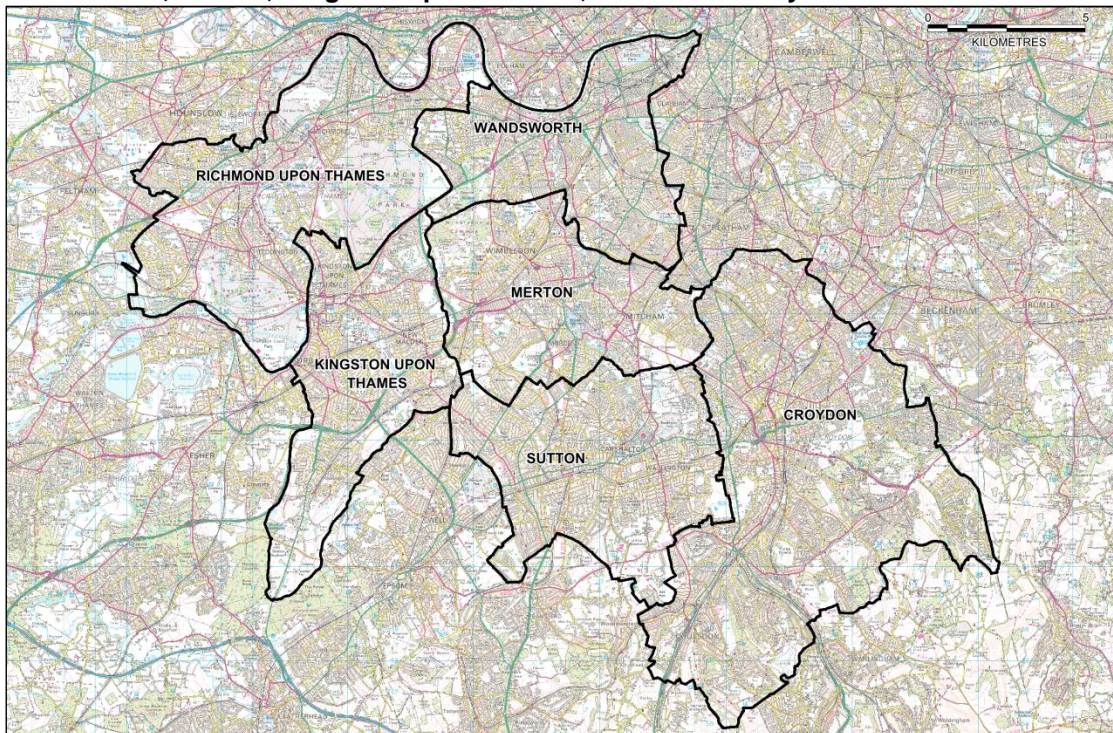
The SEA informs the Strategy through identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors. It also identifies how the Strategy can contribute to the achievement of wider environmental objectives, including Water Framework Directive (WFD) objectives.

This Environmental Report summarises the outcomes of the SEA for the Strategy of the London Borough of Richmond upon Thames.

### 2.2 South West London Flood Group

The London Borough of Richmond upon Thames forms part of the South West London Flood Group. The remaining five South West London LLFAs include the London Boroughs of Merton, Sutton, Croydon, Wandsworth and the Royal Borough of Kingston upon Thames). Strategies for each LLFA are currently in preparation via a joint South West London Flood Group initiative. The South West London Flood Group has opted to undertake a SEA for their Strategies. Figure 2.1 shows the six LLFA areas for the South West London Flood Group.

**Figure 2.1: Study Area consisting of the six London Boroughs of Richmond Upon Thames, Wandsworth, Merton, Kingston Upon Thames, Sutton and Croydon**



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## 2.3 Strategic Environmental Assessment

A SEA is being undertaken for each member of the South West London Flood Group and in parallel with the development of each of the Boroughs' Strategy's. The SEA process will ensure that environmental considerations inform the development of objectives and measures for each of the Strategies, and opportunities for environmental improvement are identified and included. It also identifies how each Strategy can contribute to the achievement of wider environmental objectives, including Water Framework Directive (WFD) objectives.

A Scoping Report has been published for the Strategies of the South West London Flood Group combined and has been subject to statutory consultation with the Environment Agency (EA), Natural England (NE), and English Heritage (EH). Non-statutory organisations were also consulted. A list of all consultees is provided in Section 3.

An Environmental Report has been provided for each of the six individual Strategies. This Environmental Report takes into account the comments received during the consultation period of the Scoping Report and summarises the results of the SEA for the Strategy of Richmond Borough.

## 2.4 Structure of the Environmental Report

This Environmental Report documents the SEA process. The purpose of this Environmental Report is to inform the preferred long-term Strategy through the identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors. The SEA Directive lists the content that is required in the Environmental Report, and these requirements have been listed in Table 2.1 below.

**Table 2.1: Requirements of the SEA Directive (Annex I)**

Requirements	Section of Report
(a) An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes	Section 5 and 6
(b) The relevant aspects of the current state of the environment and the likely evolution therefore without implementation of the plan or programme.	Section 7 and Appendix C
(c) The environmental characteristics of areas likely to be significantly affected.	Section 7 and Appendix C
(d) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as designated pursuant to Directives 79/409/EEC and 92/43/EEC.	Section 7 and Appendix C
(e) The environmental protection objectives, established at International, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.	Section 6 and Appendix A
(f) The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship of factors.	Section 9
(g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	Section 10
(h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Section 9, 8, 4 and 3.

**Table 2.1: Requirements of the SEA Directive (Annex I)**

Requirements	Section of Report
(i) A description of the measures envisaged concerning monitoring in accordance with Article 10.	Section 10
(j) A non-technical summary of the information provided under the above headings.	Section 1

In addition to the above sections listed in Table 2.1;

- Section 2 provides an introduction to the SEA process and why it is being carried out;
- Section 3 provides detail on how statutory and non-statutory consultee responses were addressed and subsequently which areas of the SEA have been developed;
- Section 4 provides a description on the methodology of the SEA process; and
- Section 8 sets out the SEA objectives, how they have been refined and the reason behind their development. Also within this section, the approach used for the assessment of the Strategy objectives, actions and alternatives is set and described.

### 3 CONSULTATION

It is a requirement of the SEA Directive that the Environmental Report is submitted for consultation to the following statutory Consultation Bodies:

- English Heritage;
- Environment Agency; and
- Natural England

Stakeholder engagement is important to the development of the Strategy and the SEA, in order to arrive at a strategy that is acceptable and to engage all parties in the SEA process.

A Scoping Report has been published for the Strategies of the South West London Flood Group combined and has been subject to statutory consultation with the aforementioned Consultation Bodies for the six week period from 28<sup>th</sup> February 2014 to 11<sup>th</sup> April 2014. The following non-statutory organisations were also consulted:

- Adjacent LLFA's, including Surrey County Council and the London Boroughs of Bromley, Lambeth and Hounslow;
- Greater London Authority;
- Thames Water;
- Royal Parks Estates;
- The Woodland Trust;
- River Thames Society;
- South West London Environment Network;
- Environment Trust for Richmond upon Thames;

- Friends of the River Crane Environment; and
- Friends of the Earth.

Comments and recommendations on the Scoping Report from all consultees have been acknowledged and addressed in this Environmental Report (Section 3.1). A full list of comments and recommendations received has been provided in Appendix D. This Environmental Report will be published for consultation alongside the draft London Borough of Richmond upon Thames Local Flood Risk Management Strategy.

### 3.1 Development from Scoping Report

Comments and recommendations on the Scoping Report have been acknowledged, and the following amendments have been made:

- **Landscape and Townscape topic has been scoped in** and the associated sustainability themes including Areas of Outstanding Natural Beauty (AONB), Land Use, Designated Landscapes and Green Infrastructure. The associated baseline information has been collected and relevant policy, plans and programmes have been reviewed. See Section 7.3 and Appendix B.
- **Additional Sustainability Themes have been scoped in** including Population Growth, Ground Water Quality, Source Protection Zones, Prisons & Secured Residential Institutions and Archaeological Priority Areas. The associated baseline information has been collected and relevant policy, plans and programmes have been reviewed. See Section 7.3 and Appendix B.
- **Relationship with the Habitat Regulation Assessment** provided in Section 6.4.
- Review of all relevant Local Plan and Local Development Framework documents provided in Appendix A.
- **Addition of 'Likely influence of Strategy' assessment** included within the baseline summary under each topic (Section 7.4). 'Likely impact without Strategy' has been included as future baseline assessment within Table 7.2.
- **Updated SEA Objectives** have been reduced from 15 to 8, refined and refocused in order to avoid duplication and overlapping, and to streamline the SEA process. Further explanation of the refinements and why they were made is provided in Section 8.2.

### 3.2 Dealing with Uncertainties

The objectives of the Strategy and the Strategy itself are high level and the Strategy does not include proposals or detail of site specific measures for management of local flood risk that can be assessed within the SEA. It is acknowledged that some of the Strategy objectives, and the measures required to deliver them, have the potential to lead to development of specific action plans or on the ground management options and activities at some point in the future (such as flood storage areas, or improved drainage management).

Whilst there is a high level of uncertainty in the areas listed below, there is still some level of detail known at this stage.

- **Unknown:** What specific local flood risk management measures will be implemented/what will action plans entail?
  - *Known:* They are likely to include flood storage areas, improved drainage management and sustainable drainage systems (SuDS).
- **Unknown:** How many measures will be implemented?

- *Known*: This is dependent on funding and the number and/or type of receptors at risk of local flooding.
- **Unknown**: Where will measures be implemented?
  - *Known*: This is dependent on how funding is prioritised and the location of the most important and/or vulnerable receptors.
- **Unknown**: When will measures be implemented?
  - *Known*: This is dependent on funding streams and the need for urgency, but assumed to be within the next five years (i.e. the lifespan of the Strategy).

The SEA will therefore provide an assessment at a level of detail that is commensurate with the nature of the Strategy objectives, which recognises the uncertainty in spatial scope and hence considers generically how the Strategy could lead to options and activities which in turn lead to significant or cumulative effects.

## 4 SEA METHODOLOGY

### 4.1 Purpose of SEA

A SEA involves the systematic identification and evaluation of the potential environmental impacts of high-level decision-making (e.g. a plan, programme or strategy). By addressing strategic level issues, the SEA aids the selection of the preferred options, directs individual schemes towards the most environmentally appropriate solutions and locations and helps to ensure that resulting schemes comply with legislation and other environmental requirements.

The potential environmental impacts of all policies and strategy objectives must be considered before deciding which policies and objectives will be adopted. Consideration should be made with regards to both the positive and negative impacts of options on wildlife and habitats, populations and health, soil, water, air, climate factors, landscape, cultural heritage and the inter-relationships between these receptors.

Flood risk management strategies are likely to play a role in setting part of a framework for future development and so it is recommended (Defra, 2006a) that plan-making authorities assess policies using the approach described in the Directive. The main aim of the EU Directive is to "provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development". The Directive is transposed into English law via the Environmental Assessment of Plans and Programmes Regulations (SI 1633, 2004).

The methodology for undertaking this assessment will follow Communities and Local Government's (CLG) Guidance on SEA<sup>1</sup>.

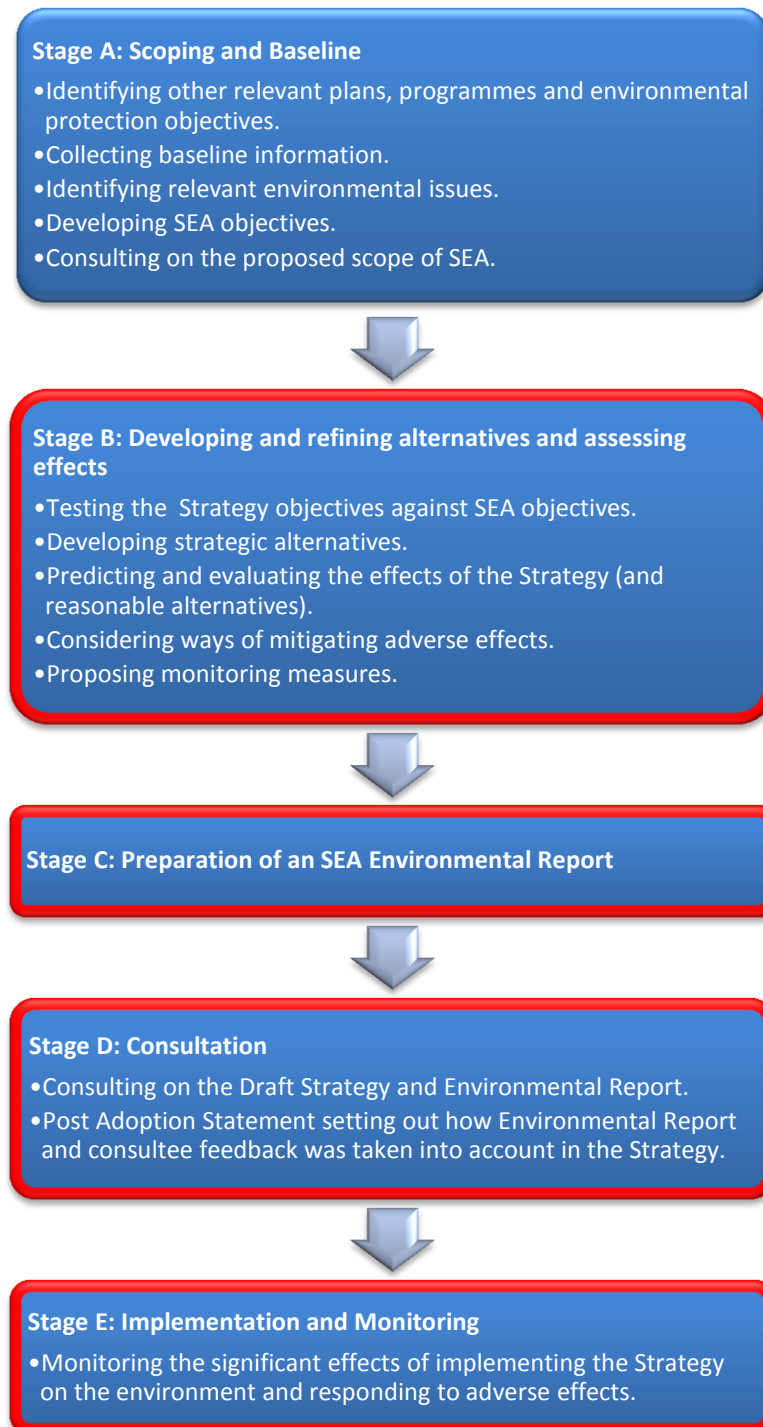
### 4.2 Stages of the SEA

CLG Guidance identifies five key stages in the SEA process, as set out in Figure 4.1.

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<sup>1</sup> Local Government Association (2011) Framework to Assist the Development of the Local Strategy for Flood Risk Management.

**Figure 4.1: Relationship between SEA stages**



Stage A and the associated tasks were carried out and reported in the Scoping Report. This Environmental Report documents Stage B to E of the SEA process, as highlighted in red in Figure 4.1, in order to meet the requirements of Regulation 12(3) of the SEA Regulations.

## 5 LFRMS FOR THE LONDON BOROUGH OF RICHMOND UPON THAMES

The Strategy is a high level, statutory document which sets out the approach to limiting the impacts of local flooding within Richmond Borough. It also promotes greater partnership working arrangements between those organisations with a responsibility for managing local flood risk (the RMAs) and provides a strategic framework within which the RMAs should work. They are 'living documents' and will be regularly reviewed.

### 5.1 Technical Scope

The primary focus of the Strategy is on management of 'local' flooding sources within Richmond Borough in both the short and long term. Local sources include surface water, groundwater and ordinary watercourses (streams, ditches, ponds and lakes). A summary of local flood risk within Richmond Borough is provided in Section 7.2.

An important distinction is that flooding from main Rivers and tidal sources is the responsibility of the Environment Agency and not directly subject to influence by the Strategy. However, it should be noted that the Strategy should also seek to ensure that local flood risk is not considered in isolation from Main River and tidal flood risk and where possible it makes the link to the work of other agencies responsible for flood management.

The Strategy provides guidance on all sources of flood risk (including Main Rivers, sewers and coastal) in order to better understand the interactions and risk posed to communities which in turn will enable Richmond Council to deliver management measures that provide the greatest benefit and resilience. Detailed flood risk management measures have been provided for 'local' flood risk, and a signpost to relevant documents and RMAs has been provided for all other sources of flood risk.

### 5.2 Relationship with other Flood Risk Plans and Assessments

The Strategy forms a key document in Richmond Council's suite of flood risk management plans, drawing on existing flood risk studies and plans into a single document that outlines how local flood risk will be managed. It builds on the outcomes of the London Borough of Richmond upon Thames Surface Water Management Plan (SWMP) and Preliminary Flood Risk Assessment (PFRA), and incorporates information from the Strategic Flood Risk Assessment (SFRA).

### 5.3 Aim, Objectives and Measures

The overarching aim of the Strategy is to better understand, communicate and manage flood risk in Richmond Borough through sustainable and coordinated approaches for the benefit of all receptors, such as people, property, services and the environment, which may be beneficially or adversely affected by the outcomes of the Strategy, now or in the future. It builds upon the outcomes of the SWMP and the PFRA.

The objectives for future local flood risk management in Richmond Borough have been developed taking into account the historic and predicted future flood risk across the Borough, the Environment Agency's national objectives for flood risk management and objectives and aims set out in complimentary plans and strategies.

The draft Strategy has 5 objectives, each with a set of measures to enable the delivery of each objective. The objectives and associated measures are set out below.

#### 1. Encourage direct involvement in decision making through the establishment of and maintaining partnerships with key organisations, including the Environment Agency and Thames Water

- Clarify roles and responsibilities of all risk management authorities and key stakeholders involved in dealing with flood risk in Richmond Borough

- Lead and maintain the Richmond Council Flood Group and work together to understand and manage local flood risk issues
- Establish and continue collaborative working relationships with neighbouring LLFA officers to manage cross-boundary flood risks, particularly with South West London boroughs
- Establish effective data and information sharing agreements, particularly with all other risk management authorities, including the Environment Agency and Thames Water
- Continue the working relationship with FORCE and other local groups.

## **2. Improve our knowledge and understanding of the interactions between different sources of flooding in Richmond Borough**

- Collate and review information on ordinary watercourses
- Develop a comprehensive flood investigation protocol, including a process map for reporting flood incidents, and agree thresholds for formal investigation to ensure that flood events are investigated where the Council deems it necessary and appropriate
- Where necessary undertake studies with the support of key stakeholders to investigate potential flood risk interactions, and ensure additional modelling will be undertaken to fully assess the joint probability of fluvial and tidal floods
- Compile and maintain a register of key structures and features that could affect flood risk in the Borough, including their significance, condition and ownership
- Identify, and where necessary designate, privately owned structures or features to ensure they are protected and encourage their owners to maintain these assets

## **3. Encourage residents, businesses and local landowners to take action and contribute to the management and reduction of flood risk**

- Develop strong and targeted communications to improve awareness and explain the level of risk affecting the residents and businesses of the Borough by providing a clear overview of the different types of flooding affecting the Borough
- Enable and empower all partners, businesses and residents to respond effectively to flooding events by providing information and guidance through engagement activities (such as consultations, workshops etc) and highlight which actions they should be taking to manage flood risk
- Work with the Environment Agency to understand the uptake of the flood warning service and encourage all other residents and businesses that are at risk of flooding to register for this service
- Integrate updated and improved flood risk modelling, in particular in relation to surface water flood risks, into future flood emergency plans and procedures
- Encourage residents in high flood risk zones to prepare flood plans and sign up to the EA Flood Line 0345 988 1188

## **4. Target resources where they have the greatest effect by adopting a risk-based approach**



- Avoid building within flood affected areas, ensure new developments are designed to minimise and reduce flood risk and consider developing planning policies or guidance for areas that are susceptible to surface water flooding, taking account of future legislation and guidance on Sustainable Drainage Systems
- Continue a pro-active approach to the management of the Council's assets, and target known problem areas e.g. gully clearing, ditches, leaf clearing
- Develop an action plan and a robust approach for prioritising spending on schemes that are designed to reduce flood risk and improve the cost/benefit ratio

**5. Contribute to wider social, economic and environmental outcomes by encouraging sustainable multi-benefit solutions for the management of local flood risk**

- Ensure that flood risk management schemes and works in the Borough enhance and improve biodiversity, water quality and the historic and natural environment where possible and take account of the likely effects of climate change
- Ensure that flood risk management schemes and works in the borough have wider benefits which bring about positive social development
- Ensure that flood risk management schemes bring about economic benefits

## 6 SUSTAINABILITY CONTEXT

### 6.1 Introduction

This section of the report outlines the key findings of the Scoping Report. It includes the outline review of the relevant plans, programmes and policies that inform the SEA and the Strategy, a summary of the baseline data and the SEA objectives and how they were developed.

### 6.2 Review of related plans, programmes and strategies

The SEA Directive requires that the SEA includes information on the relationship of the Strategy with other relevant policies, plans and programmes (Annex I(a)), as well as environmental protection legislation at international, national and local levels.

A review of these documents has been undertaken in order to identify any potential inconsistencies or constraints between these documents and the Strategy and to identify opportunities for environmental enhancement. Appendix A provides an inventory of the reviewed documents which were considered to have a bearing on the objectives of the Strategy and which were used to scope the SEA and subsequently feed into the development of the Strategy.

Table 6.1 provides a summary of the key documents which have been used throughout the preparation of the Strategy and to inform the SEA process, including the environmental baseline.

**Table 6.1: Summary of relevant plans, programmes and policies**

#### International

- EU Floods Directive (2007/60/EC) on the assessment and management of flood risks
- EU Water Framework Directive (2000/60/EC)<sup>2</sup>
- The Habitats Directive (92/43/EEC)<sup>3</sup>
- The Birds Directive 2009/147/EC (codified version of 79/409/EEC)<sup>4</sup>
- The European Convention on the Protection of Archaeological Heritage (The Valetta Convention)<sup>5</sup>

#### National

- Flood Risk Regulations (2009) (SI 3042)
- Flood and Water Management Act (2010)<sup>6</sup>
- National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England (2011)<sup>7</sup>
- Future Water – The Government's Water Strategy for England (Defra, 2008)<sup>8</sup>
- Water Act 2003<sup>9</sup>
- National Infrastructure Plan (2010)<sup>10</sup>
- The Wildlife & Countryside Act (1981) as amended (most notably by the Countryside and Rights of Way (CRoW) Act<sup>11</sup> (2000)

<sup>2</sup> Directive 2000/60/EC of the European Parliament and the Council establishing a framework for the Community action in the field of water policy accessible via:

<http://ec.europa.eu/environment/water/water-framework/>

<sup>3</sup> Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna accessible via: <http://ec.europa.eu/environment/nature/legislation/habitatsdirective/>

<sup>4</sup> Council Directive 2009/147/EC on the conservation of wild birds (codified version of 79/409/EEC)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

<sup>5</sup> <http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=143&CM=1&CL=ENG>

<sup>6</sup> <http://www.legislation.gov.uk/ukpga/2010/29/contents>

<sup>7</sup> <http://www.environment-agency.gov.uk/research/policy/130073.aspx>

<sup>8</sup> [http://www.official-documents.gov.uk/document/cm73/7319/7319.pdf?bcsi\\_scan\\_AB11CAA0E2721250=0&bcsi\\_scan\\_filename=7319.pdf](http://www.official-documents.gov.uk/document/cm73/7319/7319.pdf?bcsi_scan_AB11CAA0E2721250=0&bcsi_scan_filename=7319.pdf)

<sup>9</sup> <http://www.legislation.gov.uk/ukpga/2003/37/contents>

<sup>10</sup> HM Treasury, 2010: National Infrastructure Plan. Available at: [http://www.hm-treasury.gov.uk/ppp\\_national\\_infrastructure\\_plan.htm](http://www.hm-treasury.gov.uk/ppp_national_infrastructure_plan.htm)

**Table 6.1: Summary of relevant plans, programmes and policies**

- National Planning Policy Framework (2012)<sup>12</sup>
- Securing the Future: UK Government Sustainable Development Strategy (2005)<sup>13</sup>
- UK Biodiversity Action Plan
- National Heritage Protection Plan

#### Regional

- The London Plan (2011)
- Securing London's Water Future. The Mayors Water Strategy (2011)
- Thames Catchment Flood Management Plan (2009)
- TE2100 Flood Risk Management Plan (2012)
- Thames River Basin Management Plan (RBMP) (2009)
- London Biodiversity Action Plan 2015-20

#### Local

- London Borough of Richmond upon Thames Local Development Framework Core Strategy
- London Borough of Richmond upon Thames Surface Water Management Plan
- London Borough of Richmond upon Thames Preliminary Flood Risk Assessment
- London Borough of Richmond upon Thames Strategic Flood Risk Assessment
- London Borough of Richmond upon Thames' Parks and Open Spaces Strategy

### 6.3 Water Framework Directive (WFD) Assessment

The European Water Framework Directive (WFD) 2000/60/EC<sup>14</sup>, which was transposed into UK law in 2003 by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, represents a strategic planning process to manage, protect and enhance the condition of water bodies.

It establishes a framework for the protection of water bodies including terrestrial ecosystems and wetlands directly dependent on them.

Plans and strategies which could influence water body condition should consider WFD objectives. Although a formal WFD assessment (WFDa) is not a statutory requirement of the Strategy, WFD requirements are being considered as part of the SEA process, including where opportunities to improve WFD status exist.

### 6.4 Habitat Regulation Assessment

Under the European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the 'Habitats Directive'), and the resulting Conservation of Habitats and Species Regulations 2012, a Habitat Regulations Assessment (HRA) is required where a plan may give rise to significant effects on European designated sites, known as Natura 2000 sites.

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites, and also include potential SPA (pSPA) and candidate SAC (cSAC). Within the

<sup>11</sup> <http://www.jncc.gov.uk/page-1377>

<sup>12</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/60777/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60777/2116950.pdf)

<sup>13</sup> <https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy>

<sup>14</sup> Water Framework Directive - Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, Strasbourg, European Parliament and European Council.

study area there are two SACs, and therefore a HRA may be required. A HRA Stage 1 'Test of Likely Significant' will be undertaken for the Strategy to determine whether there are likely to be any significant effects on Natura 2000 sites. If significant effects are determined then a Stage 2 'Appropriate Assessment' will be required. The HRA process will be undertaken in parallel with the SEA and LFRMS processes and will feed into each other.

## 6.5 Identification of Key Themes

The main themes and objectives from the policies, plans and programmes review that are considered relevant to the Strategies are presented below. These are as follows:

- Reduce and manage the risks of flooding;
- Adapt to the impacts of climate change;
- Promote a strong and diverse economy;
- Promote sustainable, healthy and safe communities;
- Protect and enhance the quality, extent and character of open and green spaces, natural environments and waterways;
- Conserve flora and fauna and their habitats;
- Halt overall biodiversity loss;
- Improve water quality so all Heavily Modified waterbodies achieve 'good ecological potential' as set out in the Water Framework Directive;
- Provide an efficient, effective and robust transport system;
- Protect cultural heritage assets including conservation areas and built heritage; and
- Promote sustainable growth.

The themes and objectives identified will provide an input into the process of identifying key issues and opportunities in the development and refinement of the SEA objectives.

## 7 SEA BASELINE INFORMATION

### 7.1 Introduction

The SEA Directive states that the baseline data within the Environmental Report should include:

- Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;
- the environmental characteristics of areas likely to be significantly affected; and
- Any existing environmental problems which are relevant to the plan or programme including European sites for nature conservation.

The SEA Directive outlines aspects of the environment that must be considered as individual topics. However, if there are unlikely to be any significant effects upon a particular environmental receptor, as a result of the Strategy, it is possible to scope the topic out of the assessment.

### 7.2 Summary of Flood Risk in Richmond Borough

During the flood event of summer 2007 intense periods of rainfall exceeded the capacity of the existing drainage systems, causing significant overland flow and ponding of surface water in low lying areas across the six Boroughs. Drainage systems were overwhelmed in several locations, commercial properties were affected by bow-wave wash from vehicles and basement properties were flooded. In addition, widespread damage was caused to schools, commercial properties and disruption was experienced on the transport systems connecting the Boroughs with central London.

In the past, Richmond Borough has been affected by flooding from the River Thames, and is protected from tidal flooding by the Thames Tidal Defences (TTD). The River Crane and Beverley Brook catchments are 'flashy' systems that respond to a rainfall event quickly, in comparison to the River Thames.

### 7.3 Summary of Baseline Information

The Scoping Report identified the environmental receptors likely to be significantly affected and unlikely to be significantly affected by the Strategy. Following consultation, the scoping process was revisited and reviewed. Table 7.1 illustrates the outcomes of the updated scoping process. The full list of topics and associated sustainability themes has been provided in Appendix B.

**Table 7.1: Updated Scoping outcomes for Environmental Topics**

Environmental Topic	Scoping Outcome	Updated Scoping	Explanation
Air Quality	Out	Out	No change
Biodiversity (including flora & fauna)	In	In	No change
Climate	Out	Out	No change
Cultural, Architectural & Archaeological Heritage	In	In	'Strategic Areas of Special Character' theme moved to 'Landscape and Townscape' topic to avoid repetition. Addition of 'Archaeological Priority Areas' theme.
Geology & Soil	Out	Out	No change
Human Health	In	In	Now 'Human Health & Population' topic and 'Population Growth' theme added

**Table 7.1: Updated Scoping outcomes for Environmental Topics**

Environmental Topic	Scoping Outcome	Updated Scoping	Explanation
Landscape & Townscape	<b>Out</b>	<b>In</b>	Topic scoped in along with 'AONB', 'Land Use', 'Designated Landscapes' and 'Green Infrastructure' themes
Material Assets	<b>In</b>	<b>In</b>	'Prisons & Secured Residential Institutions' theme added
Population	<b>Out</b>	<b>In</b>	Population has been included alongside the 'Human Health' topic
Water	<b>In</b>	<b>In</b>	'Ground Water Quality' and 'Source Protection Zones' themes added

During the scoping stage, data was collected for each of the scoped in topics to determine the significance of the potential impacts arising as a result of the implementation of the Strategy. Guidance suggests that baseline information should describe environmental characteristics of areas likely to be significantly affected including areas wider than the physical boundary of the Strategy area.

Baseline data was therefore collected for the six Boroughs as a collective 'study area' and is provided in Appendix C. A summary of the baseline data relevant to Richmond Borough is provided in Table 7.2.

**Table 7.2: Summary of London Borough of Richmond upon Thames Baseline**

Environmental Topic	Summary of Baseline Data
<b>Human Health &amp; Population</b>	<ul style="list-style-type: none"> <li>• The health of people in Richmond Borough is generally better than the England average and deprivation is lower than the national average.</li> <li>• Life expectancy is higher than the national average in Richmond Borough. When comparing life expectancy between the most deprived and least deprived areas within Richmond Borough, life expectancy is 5.9 years lower for men and 4.1 years lower for women.</li> <li>• The population of Richmond Borough (as of 2011) is estimated at 187,000 and is projected to be 216,447 by 2036.</li> <li>• The health and levels of deprivation of people across Richmond Borough are likely to continue to be better than, or improve on, the national average.</li> </ul>
<b>Biodiversity (including flora &amp; fauna)</b>	<ul style="list-style-type: none"> <li>• 1 European designated sites – Richmond Park Special Area of Conservation (SAC).</li> <li>• 2 nationally designated sites – Richmond Park Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR), and Barn Elms SSSI.</li> <li>• 5 statutory Local Nature Reserves (LNR).</li> <li>• 53 Sites of Importance for Nature Conservation (SINC) of which:               <ul style="list-style-type: none"> <li>○ 16 Sites of Metropolitan Importance;</li> <li>○ 18 Sites of Borough Importance; and</li> <li>○ 19 Sites of Local Importance</li> </ul> </li> <li>• 10 out of 12 London regional BAP protected habitats – Woodland, acid grassland, reed beds, orchards, tidal Thames, rivers and streams, standing water, parks &amp; urban green spaces, private gardens and wasteland.</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>• 3 WFD waterbodies, including;               <ul style="list-style-type: none"> <li>○ Crane (including part of the Yeading Brook);</li> <li>○ Beverley Brook (Motspur Park to Thames) and Pyl Brook at West Barnes; and</li> <li>○ Thames (Egham to Teddington) (Maidenhead to Sunbury management catchment).</li> </ul> </li> <li>• All WFD waterbodies are defined as being ‘Heavily Modified’</li> <li>• No WFD waterbodies meet the WFD targets</li> <li>• All WFD waterbodies are assessed as poor ecological status</li> </ul>
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>• 60 Critical Infrastructure assets including 1 hospital, 46 primary schools, 9 secondary schools, 3 colleges and 1 university.</li> <li>• 13 Essential Infrastructure assets at risk of flooding (such as essential transport infrastructure, essential utility infrastructure, electricity power stations, electricity grid, tube stations and water treatment works)</li> <li>• 4 Highly Vulnerable Infrastructure assets at risk of flooding (such as police stations, fire stations, ambulance stations and telecommunication installations)</li> <li>• 51 More Vulnerable Infrastructure assets at risk of flooding (such as hospitals, education establishments, waste management facilities and waste water treatment works)</li> <li>• 12,450 Households at risk of flooding</li> <li>• 1,080 Commercial / Industrial properties at risk of flooding</li> <li>• Target of 3,150 new homes to be built in Richmond Borough by 2025.</li> <li>• Several important road links including the A316 and A205 trunk roads (both red routes),</li> </ul>

**Table 7.2: Summary of London Borough of Richmond upon Thames Baseline**

Environmental Topic	Summary of Baseline Data
	<p>which cross the Borough and the River Thames.</p> <ul style="list-style-type: none"> <li>The rail network is well served with overland (Waterloo and North London Lines) and underground (District Line) rail links.</li> <li>Heathrow airport is located to the north west of the Borough and generates large volumes of traffic which pass through the Borough.</li> </ul>
<b>Cultural, Architectural &amp; Archaeological Heritage</b>	<ul style="list-style-type: none"> <li>802 Listed Buildings (Grade I, II and II*), including Hampton Court Palace</li> <li>15 Registered Parks and Gardens including Richmond Park.</li> <li>1 World Heritage Site at the Royal Botanic Gardens, Kew</li> <li>4 Scheduled Ancient Monuments, such as Old Brew House</li> <li>72 Conservation Areas, such as Twickenham Riverside</li> <li>1 protected linear view from King Henry VIII's Mound, Richmond to St Paul's Cathedral</li> <li>Built heritage conservation and cultural heritage assets are likely to remain an important economic, social and environmental feature</li> </ul>
<b>Landscape &amp; Townscape</b>	<ul style="list-style-type: none"> <li>Urban environment includes district centres and town centres such as Twickenham and Richmond.</li> <li>1 Green Grid Area: Arcadian Thames.</li> <li>1 Landscape Character Areas: Thames Valley.</li> <li>Green space represents the greatest proportion of land use within the Borough (51%), followed by domestic gardens (19%), non- road/rail/path (11%), domestic buildings (7%), water (5%), non-domestic buildings (3%) and other (5%).</li> </ul>

#### 7.4 Likely influence of Strategy

The following sub-headings detail how the Strategy is likely to influence each of the topics individually. The assessment of 'Likely impact without the Strategy' has been covered under the future baseline assessment (final bullet point) for each topic in Table 7.2.

##### *Human Health & Population*

The Strategy and the options considered in it will seek to manage flood risk for the benefit of the population of Richmond Borough.

The Strategy options considered may affect public access to recreational features, goods and public services that can make a material difference to their Quality of Life. The perceived level of flood risk that communities are exposed to may also affect levels of stress and impact on Quality of Life.

##### *Biodiversity*

Strategy options may lead to construction, land use change, changes in flood risk, frequency or changes in water levels that have the potential to adversely affect nature conservation, biodiversity and landscape features. Alternatively, such changes may present opportunities to improve the condition of existing habitats or create new biodiversity and landscape features.

##### *Water*

The Strategy is unlikely to have a significant adverse impact on the water quality and resources within Richmond Borough, however it could affect the water flows.



Construction, changes in flood risk to areas of potentially contaminated land and changes in flood frequency which may arise as a result of the Strategy options could lead to physical and chemical changes in both ground and surface waterbodies. Such changes may affect a waterbody's ability to achieve and / or maintain good ecological potential.

#### *Material Assets*

The Strategy will seek to manage flood risk to critical infrastructure and material assets within Richmond Borough. The future implementation of options has the potential to disrupt critical transport infrastructure (such as road or rail networks), waste management facilities, utilities (such as clean water) or access to community care facilities (hospitals or health centres). The location of such infrastructure may influence the range of future potential options.

The future potential options may change the frequency and extent of flooding leading to consequent changes in the use of land affecting its versatility and or productivity.

#### *Cultural, Architectural & Archaeological Heritage*

Strategy objectives may lead to construction activities, land use changes or alterations to flooding regimes that can adversely affect historic environment sites and their settings. The future actions of the objectives may also manage the flood risk to heritage features or lead to improved access to historic environment sites.

#### *Landscape & Townscape*

Strategy objectives may lead to construction of flood defences, changes in flood frequency and water levels that have the potential to have negative impacts on the landscape value and character of the area. Alternatively, opportunities may exist to enhance the existing area by creating new landscape features, through sympathetic landscape designs.

## 8 SEA APPROACH

This section of the report sets out the SEA objectives, how they have been refined from the Scoping Report and the reason behind their development. Also within this section, the approach used for the assessment of the Strategy objectives, actions and alternatives is set and described.

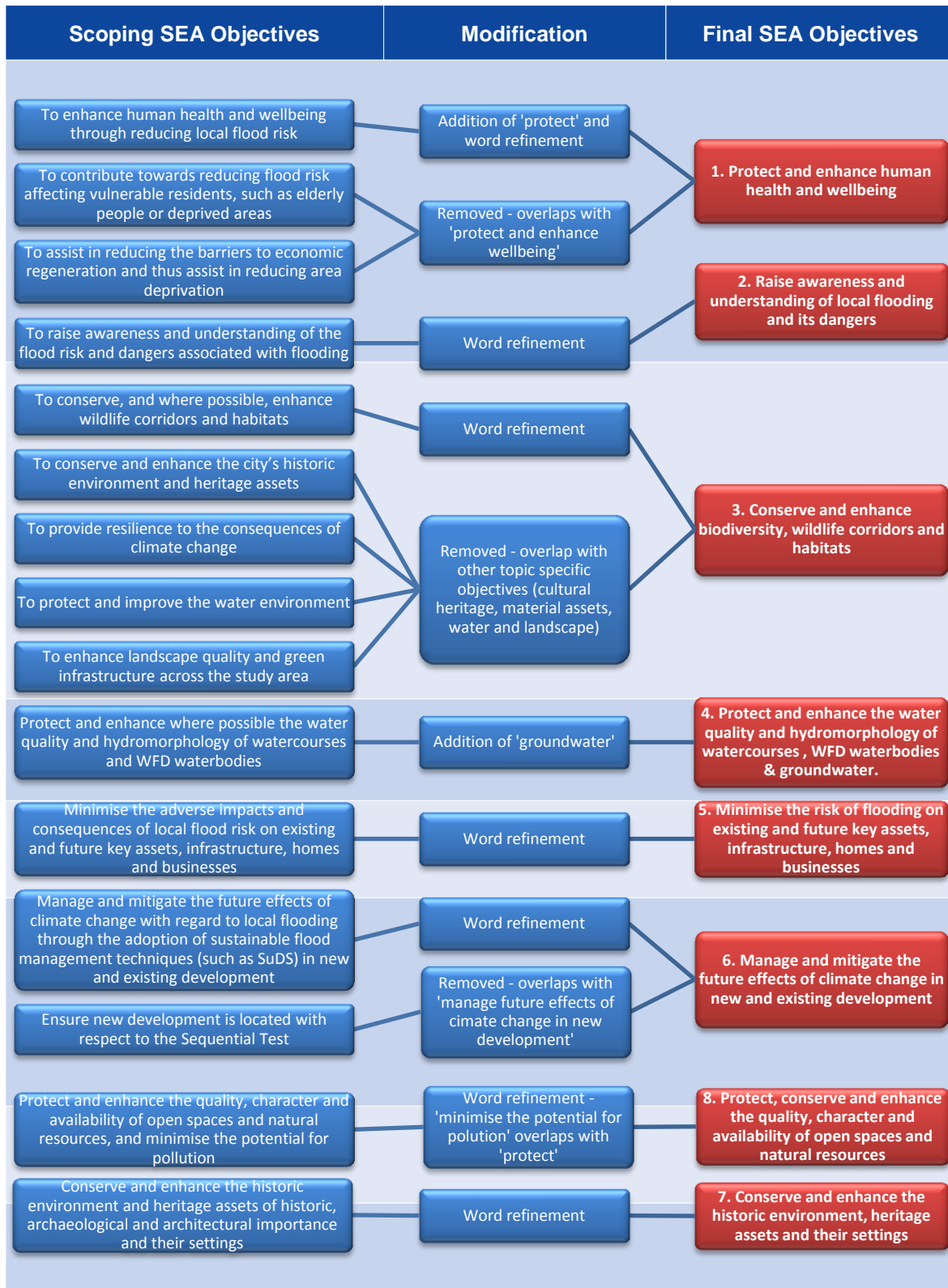
### 8.1 Initial SEA Objectives

While not specifically required by the Directive, SEA Objectives are a recognised way of considering the environmental effects of a Strategy and comparing the effects of alternatives. The Scoping Report proposed a number of initial SEA Objectives which were developed through the review of the relevant plans and programmes, and the collection of baseline data and therefore relate to the key environmental issues in Richmond Borough.

Fifteen objectives were derived from the Scoping Report. Guidance states that each objective should be genuinely needed and does not duplicate or overlap with other objectives. As a result of recommendations received from consultees and through the process of SEA; baseline review, identification of key topic issues and 'likely influence of Strategy' assessment, the 15 SEA objectives have been reduced and refined.

Figure 8.1 illustrates and explains which SEA objectives have been removed, reduced, refined and/or combined. The final SEA objectives which have used throughout the assessments have been highlighted in red.

**Figure 8.1: SEA Scoping objectives to final SEA objectives flow chart**



## 8.2 SEA Objectives

Table 8.1 lists the final SEA objectives and the key topic issues from which they were derived.

Table 8.1: SEA Objectives	
SEA Objective	Key Topic Issues
<b>Human Health &amp; Population</b>	
1. <b>Protect and enhance human health and wellbeing</b>	<ul style="list-style-type: none"> <li>• Drowning, injuries, falls, respiratory disease, shock hypothermia and cardiac arrest</li> <li>• Contact with polluted waters and damp conditions leading to infections, illness and the spread of serious waterborne diseases</li> <li>• Perceived level of flood risk and fear of flooding</li> <li>• Physical and emotional stress due to loss of property, evacuation and disturbances as a result of injury.</li> </ul>
2. <b>Raise awareness and understanding of local flooding and its dangers</b>	
<b>Biodiversity</b>	
3. <b>Conserve and enhance biodiversity, wildlife corridors and habitats</b>	<ul style="list-style-type: none"> <li>• Protect biodiversity, designated and non-designated sites from local flooding</li> <li>• The opportunity to create new habitats, either through mitigation or design</li> <li>• Irreversible changes to the hydrological balance of habitats as a result of change in land use associated with mitigation or design</li> <li>• Moving of flood risk or enhancing flood risk to another area</li> </ul>
<b>Water</b>	
4. <b>Protect and enhance the water quality and hydromorphology of watercourses, WFD waterbodies and groundwater.</b>	<ul style="list-style-type: none"> <li>• Waterbodies are of poor or moderate ecological status</li> <li>• All waterbodies must reach good ecological status by 2027</li> <li>• Local flooding can contribute to high levels of nutrients and pollutants in WFD waterbodies</li> <li>• Impacts upon surface water quality, groundwater quality and hydromorphology as a consequence of future flooding or flood risk mitigation</li> </ul>
<b>Material Assets</b>	
5. <b>Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses</b>	<ul style="list-style-type: none"> <li>• Severe disturbance to communities including impassable roads, residential and business property flooding, school closures and landslips</li> <li>• Reduced access to services including water, power and telecommunications</li> <li>• Approximately 90,000 homes are at risk from surface water flooding from a 1 in a 100 year event (1% AEP)</li> <li>• Location of future development can increase local flood risk elsewhere</li> <li>• Spread of contaminants or harmful debris from waste management sites</li> <li>• Climate change is predicted to increase frequency and severity of flooding in the future, further exacerbating other key topic issues</li> </ul>
6. <b>Manage and mitigate the future effects of climate change in new and existing development</b>	
<b>Cultural, Archaeological &amp; Architectural Heritage</b>	

SEA Objective	Key Topic Issues
<b>7. Conserve and enhance the historic environment, heritage assets and their settings</b>	<ul style="list-style-type: none"> <li>Some heritage assets are likely to be at risk of flooding, and/or are reliant on water levels/flow</li> <li>Measures may negatively impact the historical landscape, while protecting a particular asset</li> </ul>
<i>Landscape &amp; Townscape</i>	
<b>8. Protect, conserve and enhance the quality, character and availability of open spaces and natural resources</b>	<ul style="list-style-type: none"> <li>Potential damage and reduced access to national and locally important open spaces, parks and recreation areas</li> <li>The protection of biodiversity, designated and non-designated sites from local flooding</li> <li>Irreversible changes to the hydrological balance of habitats as a result of change in land use associated with mitigation or design</li> </ul>

### 8.3 Assessment Approach

For the purpose of this SEA, an objectives based approach has been adopted. This approach uses the SEA objectives to assess the Strategy objectives, measures and alternatives in order to assess the Strategy's potential impacts on the environment.

A series of matrices will be used to evaluate each objective to determine how the implementation of the Strategy will impact on the environment. These matrices will show the likely impacts of the objectives and measures of the Strategy.

The impacts are described in relation to:

- Whether they are positive or negative;
- The magnitude (major or minor);
- Whether they are secondary, cumulative and/or synergistic (direct or indirect);
- The spatial extent (local, regional or national);
- The timescale (short, medium or long term); and
- The permanence and reversibility (permanent, temporary, reversible or irreversible)

Table 8.2 demonstrates a scoring criterion the type and significance of impacts resulting from the implementation of the Strategy. Where it has been considered that 'no relationship' exists between SEA objective and Strategy objective, this does not mean that there is no potential for any impacts to occur in the future, instead further detail would be required on how and where measures are developed and this is not known at a strategic level.

Type of Impact	Description
<b>Direct</b>	An impact on one or more SEA objective may occur as a primary function of the implementation of a particular Strategy objective – a primary beneficial or adverse impact.

**Table 8.2: Strategy objective impacts description**

Type of Impact	Description
<i>Indirect</i>	An impact on one or more SEA objective may occur as a secondary function of the implementation of a particular Strategy objective – a secondary beneficial or adverse impact.
Major positive (++)	Significantly beneficial to the SEA objective – Multiple opportunities for environmental improvement or resolves existing environmental issue.
Minor positive (+)	Partially beneficial (not significant) to the SEA objectives – Contributes to resolving an existing environmental issue or offers some opportunities for improvement.
No relationship / Neutral (N)	Neutral effect on the SEA objective and environment.
Uncertain (?)	Insufficient detail on the option or baseline – Cannot effectively assess the significance of the Strategy objective on the SEA objective.
Minor negative (-)	Partially undermines (not significantly) the SEA objective – Option would contribute to an environmental issue or reduce opportunities for improvement.
Major negative (- -)	Significantly undermines the SEA objective – Will significantly contribute to an environmental problem or undermine opportunity for improvement.

## 9 ASSESSMENT OF STRATEGY OBJECTIVES AND ALTERNATIVES

### 9.1 Introduction

This section of the report sets out the assessment of Strategy objectives and alternative options against SEA objectives, how the alternative options were derived and why those alternatives were deemed reasonable, realistic and relevant. Also within this section, cumulative effects on receptors are assessed, as a result of the implementation of the Strategy and as a combined result of effects from implementation of other plans, programmes and strategies.

As listed in Section 5.3, the Richmond Borough Strategy objectives are:

1. Encourage direct involvement in decision making through the establishment of and maintaining partnerships with key organisations, including the Environment Agency and Thames Water,
2. Improve our knowledge and understanding of the interactions between different sources of flooding in Richmond Borough,
3. Encourage residents, businesses and local landowners to take action and contribute to the management and reduction of flood risk,
4. Target resources where they have the greatest effect by adopting a risk-based approach, and,
5. Contribute to wider social, economic and environmental outcomes by encouraging sustainable multi-benefit solutions for the management of local flood risk.

### 9.2 Timescale

In order to establish the duration of the likely impacts resulting from the implementation of the Strategy, the assessment has been made with two time periods in mind. The assessment determines whether the effects are likely to arise in;

- The short term – expected in the next 1 to 5 years (the life of the Strategy); or
- The long term – expected in the next 5+ years (beyond the life of the Strategy).

### 9.3 Developing strategic alternatives

Each Strategy objective has a number of associated measures (as listed in section 5.2), which in turn have multiple actions set out in order to achieve those measures. In total, the Richmond Borough' Strategy has 19 measures and a number of actions. Since this amounts to a large number of alternative scenarios (i.e. where some measures/actions are fully or partially implemented, or not implemented at all), it has been considered inappropriate to assess each individual measure/action.

The following assessment therefore evaluates the impact of the overarching Strategy objectives on the achievement of the SEA objectives in the short and long term.

To ensure the assessment is informed and fair, a 'do nothing' alternative has been included in order to show how the current state of the environment is likely to evolve without the Strategy in the short and long term.

### 9.4 Assessment of objectives

In order to evaluate the impacts of implementing the Strategy, the objectives have been assessed against the SEA objectives (Table 8.1). The Strategy objectives are tested against the SEA objectives to:

- Ensure compatibility (direct, indirect or uncertain);

- Identify the nature of any potential environmental impacts (positive, negative or neutral); and
- Identify the significance of any potential environmental impacts (major or minor).

The results of this assessment are shown in Table 9.1 which has been completed using the criteria set out in Table 8.2.



Table 9.1: Compatibility and assessment of the Strategy objectives against the SEA objectives			SEA Objectives								
			1	2	3	4	5	6	7	8	
			Protect and enhance human health and wellbeing	Raise awareness and understanding of local flooding	Conserve and enhance biodiversity, wildlife corridors and habitats	Protect and enhance water quality and hydromorphology	Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses	Manage and mitigate the future effects of climate change in new and existing development	Protect, conserve and enhance the quality, character and availability of open spaces and natural resources	Conserve and enhance the historic environment, heritage assets and their settings	
Strategy Objectives	1	Encourage direct involvement in decision making through the establishment of and maintaining partnerships with key organisations, including the Environment Agency and Thames Water	Short term	Indirect +	<b>Direct +</b>	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +
		Long term	Indirect +	<b>Direct +</b>	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +
	2	Improve our knowledge and understanding of the interactions between different sources of flooding in Richmond Borough	Short term	Indirect ++	<b>Direct ++</b>	Indirect +	Indirect +	Indirect +	Indirect ++	Indirect +	Indirect +
			Long term	Indirect ++	<b>Direct ++</b>	Indirect +	Indirect +	Indirect +	Indirect ++	Indirect +	Indirect +
	3	Encourage residents, businesses and local landowners to take action and contribute to the management and reduction of flood risk	Short term	Indirect ++	<b>Direct ++</b>	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +
			Long term	Indirect ++	<b>Direct ++</b>	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +	Indirect +

Table 9.1: Compatibility and assessment of the Strategy objectives against the SEA objectives			SEA Objectives								
			1	2	3	4	5	6	7	8	
4	Target resources where they have the greatest effect by adopting a risk-based approach	Short term	<i>Indirect +</i>	<b>Direct +</b>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>
		Long term	<i>Indirect +</i>	<b>Direct +</b>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>
5	Contribute to wider social, economic and environmental outcomes by encouraging sustainable multi-benefit solutions for the management of local flood risk	Short term	<i>Indirect +</i>	N	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>	<i>Indirect +</i>
		Long term	<i>Indirect ++</i>	N	<i>Indirect ++</i>	<i>Indirect ++</i>	<i>Indirect ++</i>	<i>Indirect ++</i>	<i>Indirect ++</i>	<i>Indirect ++</i>	<i>Indirect ++</i>

### 9.4.1 Assessment Summary

The assessment of the Strategy objectives against the SEA objectives concludes that the Strategy is unlikely to have any negative impacts on the environment, since all of the Strategy objectives and associated measures are predicted to have either minor positive or major positive impacts on the environment. The majority of beneficial impacts as a result of implementation of the Strategy will be indirect. Direct positive impacts have only been predicted for SEA objective 2 (raise awareness and understanding of local flooding).

### 9.4.2 Direct Impacts

#### SEA Objective 2 – Raise awareness and understanding of local flooding

Two of the Strategy objectives (objectives 2 and 3) are predicted to have major positive direct impacts on SEA objective 2. The overarching aim of the two Strategy objectives is to further build the flood mechanism, incidents and assets evidence base and to ensure the information is used by policy and decision makers, as well as better informing members of the public. This in turn provides the opportunity to learn from previous incidents, document lessons learnt and apply those lessons to improve flood management procedures and better understand the risks, over the duration of the Strategy and beyond.

Two Strategy objectives (1 and 4) are also predicted to have minor positive direct impacts on SEA objective 2. Working collaboratively with Risk Management Authorities (RMA's) (Strategy objective 1) involves the sharing of local flood risk information, allocating responsibilities and maximising the use of resources in targeted flood management (Strategy objective 4) which includes measures such as creating specific action plans for local flooding hotspots.

### 9.4.3 Indirect Impacts

#### SEA Objective 1 – Protect and enhance human health and wellbeing

The assessment concludes that no Strategy objective will directly influence SEA Objective 1 (protect and enhance human health and wellbeing) since no specific action plans or on the ground management activities have been identified in the Strategy.

However, major positive indirect impacts on SEA Objective 1 have been predicted for three Strategy objectives (2, 3 and 5). The indirect positive impacts predicted for Strategy objectives 2 and 3 are the secondary beneficial impacts from the direct impacts identified above. For example, by improving awareness and understanding of local flooding with the general public and encouraging proactive management (Strategy objective 3), this in turn will contribute towards better protection against local flooding and thus enhancing human health.

#### SEA Objectives 3 – Conserve and enhance biodiversity, wildlife corridors and habitats

#### SEA Objectives 4 – Protect and enhance the water quality and hydromorphology of watercourses, WFD waterbodies and groundwater

#### SEA Objectives 7 – Conserve and enhance the historic environment, heritage assets and their settings

#### SEA Objectives 8 – Protect, conserve and enhance the quality, character and availability of open spaces and natural resources

The assessment concludes that no Strategy objective will directly influence SEA Objective 3, 4, 7 and 8. No specific action plans or on the ground management activities have been identified in the Strategy which specifically target the conservation, protection and enhancement of the biodiversity, water environment (surface and ground water), landscape, townscape, cultural or historical assets of Richmond Borough.

However, a major positive indirect impact on SEA Objectives 3, 4, 7 and 8 has been predicted for Strategy objective 5 (encourage sustainable multi-benefit solutions for the management of local flood risk). The major positive indirect impact is predicted to occur in the long term (i.e. beyond the life of the Strategy), on the basis that it will take time for a secondary positive effect from the implementation of the Strategy to be seen. For example, the main aim of Strategy objective 5 is to encourage sustainable local flood management measures which achieve multiple benefits, setting out measures such as to ensure proposed schemes contribute to the enhancement of the natural environment. As a result, there is likely to be secondary positive impacts such as improvements in the water quality of nearby watercourses and a subsequent increase in biodiversity and wildlife.

The majority of Strategy objectives have therefore been assessed as having minor indirect positive impacts on SEA objectives 3, 4, 7 and 8. For example, the primary impact of collaborating and working more effectively with RMA's (Strategy objective 1) is a better understanding of local flooding and how it is managed to ultimately reduce the risk associated with local flooding. By working collaboratively to reduce local flood risk, the conservation, protection and enhancement of the landscape, townscape and particular heritage assets can be achieved.

#### SEA Objective 5 – Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses

The assessment concludes that no Strategy objective will directly influence SEA Objective 5 (minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses) since no specific action plans or on the ground management activities have been identified in the Strategy.

However, one major positive indirect impact on SEA Objective 5 has been predicted for Strategy objective 5. By implementing this Strategy objective, risk of flooding to existing and future development may be reduced in the long term (i.e. allowing time for local measures to be implemented) through the provision and retrofitting of suitable local flood prevention measures.

The remaining Strategy objectives have therefore been assessed as having minor indirect positive impacts on SEA objective 5. For example, the primary impact of improving awareness of the causes of local flooding with the general public and encouraging proactive management (Strategy objective 3) is an increased awareness and ability amongst members of the public and businesses to better prepare themselves and their properties against local flooding. Thus, a secondary indirect beneficial impact is predicted in the long term (i.e. allowing time for awareness to be raised and proactive management to take place) in terms of reducing local flood risk on homes and businesses.

#### SEA Objective 6 – Manage and mitigate the future effects of climate change in new and existing development

The assessment concludes that no Strategy objective will directly influence SEA Objective 6 (manage and mitigate the future effects of climate change in new and existing development) since no specific action plans or on the ground management activities have been identified in the Strategy.

However, major positive indirect impacts on SEA Objective 6 have been predicted for two Strategy objectives (2 and 5). For example, the overarching aim of Strategy objective 2 is to build a flooding evidence base, ensure this feeds into policy and decision making, and subsequently support sustainable growth and development (Strategy objective 5). By implementing these Strategy objectives, existing developments may be retrofitted and new developments provided with suitable water management schemes to better manage the predicted extremes in weather (such as increased surface water runoff) as a result of climate change.

## 9.5 Assessment of alternatives

For each of the Strategy objectives, a 'do nothing' alternative has been included in order to show how the current state of the environment is likely to evolve without the Strategy.

The 'do nothing' alternative assumes that the Strategy is not implemented. Existing consenting and maintenance regimes, such as clearance or maintenance of gullies, already undertaken by Richmond

Council would continue and land use and spatial planning methods would remain the same. It also assumes that no attempts are made to increase understanding of flood risk or to improve methods of flood recording, flood risk studies are not carried out, the public are not kept informed on flood risk, flood risk management groups and authorities are not retained, and advice or funding for local schemes is not provided.

As a result, there would be an increased risk to property and communities from flooding from surface water, groundwater and ordinary watercourses. Effects on the natural environment without the Strategy are largely uncertain, particularly as flood risk will increase with climate change. This will mean changes to habitats and species affected by flooding, increased pollution associated with flood events and an increased risk of flood damage to historic assets.

Table 9.2: Assessment of the 'do nothing' alternative against the SEA objectives			SEA Objectives								
			1	2	3	4	5	6	7	8	
			Protect and enhance human health and wellbeing	Raise awareness and understanding of local flooding	Conserve and enhance biodiversity, wildlife corridors and habitats	Protect and enhance water quality and hydromorphology	Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses	Manage and mitigate the future effects of climate change in new and existing development	Protect and enhance the quality, character and availability of open spaces and natural resources	Conserve and enhance the historic environment, heritage assets and their settings	
Strategy Objectives	1	Disband flood risk management groups and boards	Short term	Indirect -	<b>Direct -</b>	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -
		Long term	Indirect -	<b>Direct - -</b>	Indirect -	Indirect -	Indirect - -	Indirect - -	Indirect -	Indirect -	
	2	Make no attempt to increase understanding or improving methods of flood recording	Short term	Indirect -	<b>Direct - -</b>	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -
		Long term	Indirect -	<b>Direct - -</b>	Indirect -	Indirect -	Indirect - -	Indirect - -	Indirect -	Indirect -	
	3	Do nothing to keep people informed of flood risk	Short term	Indirect -	<b>Direct - -</b>	N	N	Indirect -	Indirect -	N	N
		Long term	Indirect -	<b>Direct - -</b>	N	N	Indirect - -	Indirect - -	N	N	
	4	Do not use flood risk information to direct resources to high risk areas or seek sources of funding	Short term	Indirect -	N	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -
		Long term	Indirect -	N	Indirect -	Indirect -	Indirect - -	Indirect - -	Indirect -	Indirect -	
	5	Only carry out the minimum/required maintenance and cleansing when reported. Does not take account of climate change	Short term	Indirect -	N	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -	Indirect -
		Long term	Indirect - -	N	Indirect - -	Indirect - -	Indirect - -	Indirect - -	Indirect - -	Indirect - -	

### 9.5.1 Assessment Summary

The assessment of each of the Strategy objective 'do nothing' alternative scenarios against the SEA objectives concludes that a 'do nothing' approach is most likely to have a negative impact on the environment, since all of the Strategy objectives and associated measures are predicted to have either minor negative or major negative impacts on the environment. The majority of adverse impacts that are predicted to occur should a 'do nothing' approach be adopted are likely to be indirect. Direct negative impacts have only been predicted for SEA objective 2 (raise awareness and understanding of local flooding). A number of 'do nothing' scenarios are also considered to have a neutral effect on the SEA objectives.

### 9.5.2 Direct Impacts

#### SEA Objective 2 – Raise awareness and understanding of local flooding

Three of the 'do nothing' scenarios (Strategy objectives 1, 2 and 3) are predicted to have major negative impacts on SEA objective 2. Although it is assumed that a standard of flood awareness already exists, this alternative scenario has received a negative assessment because without knowing the risks and how they are predicted to increase with climate change, flood risk is unlikely to be minimised or reduced. Raising awareness helps to protect human health and wellbeing as people are then able to take actions to protect themselves and their property accordingly.

Two 'do nothing' scenarios (4 and 5) were considered to have a neutral impact on SEA objective 2. Strategy objective 4 is concerned with where resources are focused and prioritising spending based on cost benefit ratios, whilst Strategy objective 5 aims to deliver schemes which achieve multiple benefits to society and the environment. As a result, neither objective is considered to have a direct or indirect impact on awareness raising or improving understanding.

### 9.5.3 Indirect Impacts

#### SEA Objective 1 – Protect and enhance human health and wellbeing

One 'do nothing' scenario (Strategy objective 5) is predicted to have a major negative indirect impact on SEA objective 1. The alternative scenario for Strategy objective 5 is to only carry out the minimum/required maintenance and cleansing when reported, without taking account of climate change. This scenario represents a reactive rather than a proactive approach to local flood risk management. Without regular routine maintenance, problems are unlikely to be detected until flooding occurs. With the risk of flooding increased through a lack of maintenance, this alternative scenario is predicted to have an indirect negative impact in the long term (i.e. beyond the life of the Strategy and allowing time for the effects of climate change) by putting human health at risk, and reducing quality of life if services fail, transport routes become blocked or homes become flooded.

#### SEA Objectives 3 – Conserve and enhance biodiversity, wildlife corridors and habitats

#### SEA Objectives 4 – Protect and enhance the water quality and hydromorphology of watercourses, WFD waterbodies and groundwater

#### SEA Objectives 7 – Conserve and enhance the historic environment, heritage assets and their settings

#### SEA Objectives 8 – Protect, conserve and enhance the quality, character and availability of open spaces and natural resources

One 'do nothing' scenario (Strategy objective 5) is predicted to have a major negative indirect impact on SEA Objectives 3, 4, 7 and 8. The major negative indirect impact is predicted to occur in the long term (i.e. beyond the life of the Strategy) when impacts could become exacerbated as the effects of climate change become more apparent and flood risk increases. As described above, without regular routine maintenance, problems are unlikely to be detected until flooding occurs, increasing the risk of local flooding which in turn is likely to have a negative impact on biodiversity, the water environment

(surface and ground water), landscape, townscape, cultural and historical assets within Richmond Borough. For example, a lack of multi-benefit schemes will not only increase local flood risk, but is also likely to lead to a deterioration in water quality of watercourses and a subsequent decline in biodiversity and wildlife.

The majority of the 'do nothing' scenarios have been assessed as having a minor indirect negative impact on SEA objectives 3, 4, 7 and 8. For example, the 'do nothing' scenario for Strategy objective 1, disbanding flood risk management groups and boards, will result in a fragmented approach to local flood risk management and as a result may increase the risk of local flooding to wildlife, townscapes and historical assets.

**SEA Objective 5 – Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses**

**SEA Objective 6 – Manage and mitigate the future effects of climate change in new and existing development**

All 'do nothing' scenarios (Strategy objectives 1 to 5) are predicted to have major negative indirect impacts on SEA Objective 5 and 6. The major negative indirect impacts are predicted to occur in the long term (i.e. beyond the life of the Strategy) when impacts could become exacerbated as the effects of climate change become more apparent and flood risk increases. Doing nothing to incorporate flood risk in development plans will not aid the minimisation of flood risk or the adaptation to the impacts of climate change in future and existing developments. For example, the effects of climate change, such as increased rainfall and surface runoff are likely to lead to an increased risk of local flooding. Without the implementation of preventative local flood risk measures and actions as outlined in the Strategy, major indirect negative impacts are predicted for existing and future development.

## 9.6 Assessment of cumulative effects

Cumulative effects arise where several plans or projects together have a significant effect, or where several individual effects of the Strategy have a combined effect.

Guidance on the principles of assessing cumulative effects recommends that the assessment:

- Focuses on the total effect of both direct and indirect effects on receptors (such as biodiversity, water, cultural heritage, etc.);
- Takes into account the nature and extent of the receptors, such as ecosystems and communities, rather than administrative boundaries;
- Takes into account the effects of proposals within the Strategy and those which may result from interaction with the effects of other plans, programmes or strategies; and
- Is aware of and documents the level of uncertainty.

Given the number of plans, programmes and action plans being undertaken through other organisations, and their associated management activities for each environmental topic, there is potential for cumulative effects with the Strategy.

The plans, programmes and action plans provided in Appendix A were reviewed and used as a basis for cumulative effects assessment. Professional judgment was also used to identify effects arising from these plans which may have cumulative effects with the Strategy. Particular attention was given to those effects which may be insignificant within individual plans, but cumulatively may be potentially significant.

It should be noted, however, that many of the relevant plans and programmes which have been reviewed in Appendix A are reported at a strategic level, as is the Strategy, and therefore do not directly relate to physical changes or actions 'on the ground'. The level of risk and uncertainty



associated with cumulative effects increases at a higher strategic level because the scale is broader and environmental issues are larger.

The level of uncertainty in predicting effects and determining significance is due to:

- Variation in natural systems and interactions across the study area (all six Boroughs of the South West London Flood Group);
- Lack of information or knowledge regarding cause-effect relationships; and
- Inability of predictive models to accurately represent complex systems.

### **9.6.1 Assessment Summary**

At this stage of environmental assessment, and due to the high level nature of this assessment (i.e. no site specific measures or on the ground activities have been presented), the assessment of potential cumulative impacts of the Strategy and other plans, programmes and action plans concludes that there is likely to be both beneficial and adverse cumulative effects.

#### **SEA Objective 1: Protect and enhance human health and wellbeing**

The plans reviewed have beneficial effects of raising flood risk awareness, either through consultation or implementation of local flood risk management measures. There is generally a cumulative effect with the Strategy in reducing anxiety related to uncertainty of local flood risk and the knowledge of the individual actions which can be taken. However, there may be increased stress to residents in some areas which are identified as being at risk of flooding by the Strategy or other plans.

#### **SEA Objective 2: Raise awareness and understanding of local flooding and its dangers**

The Strategy promotes the public's ability to respond to local flood risk and to protect property by providing information and advice on managing local flood risk, and providing assistance where possible. The Strategy also encourages best practice in the maintenance of assets when preparing for local flood events and reducing local flood risk. Other plans which provide information for asset maintenance will ensure impacts on infrastructure and economic damage from flooding do not increase.

#### **SEA Objective 3: Conserve and enhance biodiversity, wildlife corridors and habitats; and SEA Objective 4: Protect and enhance the water quality and hydromorphology of watercourses and WFD waterbodies**

The Strategy seeks to alleviate local flood risk by encouraging best practice for the maintenance of flood prevention and drainage assets, however this practice may sometimes have adverse effects on biodiversity, for example clearance of vegetation may lead to habitat loss along river corridors and deterioration in water quality. The Strategy does not refer to any specific schemes, but there may be opportunities for multi beneficial schemes which have positive effects on water quality and subsequently biodiversity from small-scale measures such as implementation of SuDS or changes in drainage. There may also be cumulative benefits to biodiversity and water quality through strategic management of local flood risk, as enabling natural flood patterns to continue or extend in some areas can improve wetland habitats.

Other plans and strategies provide mitigation to avoid impacts on designated sites, protected species, BAP habitats and aquatic species as part of flood prevention measures. However, cumulative impacts may arise where a number of measures combine to alter hydrological systems or land use. For instance, many small changes to water levels may result in overall gains or losses freshwater habitats or there may be cumulative effects on a particular species or type of habitat.

SEA Objective 5: Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses; and SEA Objective 6: Manage and mitigate the future effects of climate change in new and existing development

The Strategy and other plans and programmes have limited contribution to greenhouse gases and no cumulative effects have been identified.

The effects of climate change and increased flood risk is a key driver behind the Strategy and other Flood Management Plans. These plans and strategies aim to ensure that the flood risk to communities and property does not increase with climate change. However, working with natural systems would have environmental benefits, for instance to wetlands and moorland landscapes. Fully alleviating all risk of local flooding is not financially possible, and there are cumulative benefits to both people and the natural environment in the strategic management of future local flood risk.

SEA Objective 7: Conserve and enhance the historic environment, heritage assets and their settings; and SEA Objective 8: Protect, conserve and enhance the quality, character and availability of open spaces and natural resources

The Strategy, in addition to other flood risk management plans, protects landscape, historic assets and townscape from damage as a result of local flooding. There are cumulative benefits from protecting many assets of local value in the built environment which comprise Richmond Borough' heritage.

However, the plans and strategies reviewed include flood prevention measures including property protection to flood barriers and there may be cumulative effects on landscapes and townscapes from a number of small but intrusive flood prevention schemes. There may also be cumulative effects on unknown sites, the preservation of which may be affected by water levels.

## 10 CONCLUSIONS AND MONITORING

### 10.1 Conclusion

The SEA has demonstrated that the London Borough of Richmond upon Thames Local Flood Risk Management Strategy is predicted to have positive impacts on the environment in the short term and in the long term (i.e. beyond the life of the Strategy), since the Strategy takes a proactive approach to reducing and managing local flood risk within Richmond Borough. Each of the Strategy objectives successfully supports the range of environmental objectives identified within the SEA framework, achieving a positive outcome for each SEA objective.

For example, Strategy objective 5, encourage sustainable multi-benefit solutions for the management of local flood risk which take account of the likely effects of climate change. This objective will help reduce local flooding in areas that are at highest risk and susceptible to the effects of climate change, whilst also providing longer term beneficial impacts since the solutions will be designed to last many years and would remain in place after the life of the Strategy.

The majority of Strategy objectives are likely to have indirect beneficial effects on the environment as they relate to improving knowledge, understanding and high level management of local flood risk rather than actual works or actions that could have an effect on the ground.

The assessment of the 'do nothing' alternative scenario for each Strategy objective highlights that by allowing the environment to evolve without the Strategy, there would be negative impacts on the environment. Doing nothing to improve understanding or the management of local flood risk does not strive to minimise the risk of local flooding, leaving many people, businesses and infrastructure at risk and without necessary support. In time, the impacts of doing nothing are likely to be exacerbated by the impacts of climate change and effects are likely to be seen across all environmental receptors.

The assessment of potential cumulative impacts of the Strategy and other plans, programmes and action plans concludes that there is likely to be both beneficial and adverse cumulative effects. However, due to the high level nature of this assessment (i.e. no site specific measures or on the ground activities have been presented) it is not possible to accurately predict the likely significance of cumulative effects. Therefore, monitoring has been proposed (section 10.3) in order to identify potential cumulative effects.

Overall, the synergistic and cumulative effects of all the Strategy objectives and measures combined are considered to be beneficial for the environment, due to the likely outcomes of improved local flood risk management and subsequently reduced local flood risk to the natural and built environment within Richmond Borough. Therefore, no recommendations for the Strategy from the SEA have been put forward.

### 10.2 Mitigation

The assessment of the Strategy objectives and measures has found that no negative impacts are likely to result from the implementation of the Strategy; therefore no recommendations for mitigation measures will be made at this level. Measures for mitigation should be made at individual site level as part of any EIAs required, to ensure that any potential for negative impacts to arise are avoided.

### 10.3 Proposed Monitoring

It is a requirement of the SEA Directive that significant environmental effects as a result of the implementation of the Strategy are monitored. Monitoring of the Strategy will enable the identification of any unforeseen adverse effects and allow Richmond Council to undertake any appropriate remedial works required, as well as recording the success of any schemes implemented.

The Strategy has been developed to manage local flood risk over the next 5 years; therefore a review of the Strategy will provide a good opportunity to review any changes to the environmental baseline.

Table 10.1 shows the SEA monitoring framework and the potential monitoring indicators for each SEA objective. Data required for the monitoring of the Strategy implementation can come from a number of sources including Richmond Council, the Environment Agency, Natural England and English Heritage.

<b>Table 10.1: Proposed indicators for monitoring the potential significant and uncertain environmental effects of the Strategy</b>	
<b>SEA Objective</b>	<b>Potential Monitoring Indicator</b>
<b>Human Health &amp; Population</b>	
<b>1. Protect and enhance human health and wellbeing</b>	<ul style="list-style-type: none"> <li>Number of flood incidents reported</li> <li>Number of properties / businesses at risk of flooding</li> <li>Number of flood related injuries/fatalities</li> <li>Number of measures located in areas with an above average number of elderly people or level of deprivation</li> </ul>
<b>2. Raise awareness and understanding of local flooding and its dangers</b>	
<b>Biodiversity</b>	
<b>3. Conserve and enhance biodiversity, wildlife corridors and habitats</b>	<ul style="list-style-type: none"> <li>Area of habitat enhanced as a result of flood reduction measures</li> <li>Negative impacts on statutory and non-statutory ecological sites as a result of flooding.</li> </ul>
<b>Water</b>	
<b>4. Protect and enhance the water quality and hydromorphology of watercourses, WFD waterbodies and groundwater.</b>	<ul style="list-style-type: none"> <li>WFD objectives achieved on watercourses where measures have been implemented</li> <li>Consultation with the Environment Agency regarding ecological and chemical status of waterbodies</li> </ul>
<b>Material Assets</b>	
<b>5. Minimise the risk of flooding on existing and future key assets, infrastructure, homes and businesses</b>	<ul style="list-style-type: none"> <li>Number of residential and non-residential properties at risk of flooding from local sources</li> <li>Number/severity/duration of incidents leading to unplanned disruption or damage to essential infrastructure and service provision</li> <li>Number of SuDS schemes adopted into existing and future developments</li> <li>Number of new developments permitted in areas of flood risk</li> </ul>
<b>6. Manage and mitigate the future effects of climate change in new and existing development</b>	
<b>Cultural, Archaeological &amp; Architectural Heritage</b>	
<b>7. Conserve and enhance the historic environment, heritage assets and their settings</b>	<ul style="list-style-type: none"> <li>Number/area of designated heritage assets at risk of local flooding</li> <li>Number/area of Conservation Areas which have changed as a result of the Strategies</li> <li>Number of listed buildings on the 'at risk'</li> </ul>

**Table 10.1: Proposed indicators for monitoring the potential significant and uncertain environmental effects of the Strategy**

SEA Objective	Potential Monitoring Indicator
	register at risk from flooding
<b><i>Landscape &amp; Townscape</i></b>	
<b>8. Protect, conserve and enhance the quality, character and availability of open spaces and natural resources</b>	<ul style="list-style-type: none"> <li>• Number/area of open spaces at significant risk of local flooding, identified using site specific surface water or ordinary watercourse flood modelling</li> <li>• Number of measures that include enhancements to open spaces and recreational areas</li> <li>• Area of enhanced landscape and green infrastructure as a result of flood reduction measures</li> </ul>

## APPENDIX A – POLICY CONTEXT REVIEW

Plan	Key Messages	SEA Topics
<b>International</b>		
SEA Directive (2001) Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment	Contributes to the high level environmental protection and the consideration of environmental issues in the preparation and adoption of plans and programmes with the intent of promoting sustainable development.	All
The Johannesburg Declaration of Sustainable Development (2002)	Commits the nations of the world to sustainable development.	All
Arhus Convention (1998) (Convention on Access to Information, Public Participation in decision – making and Access to Justice in environmental Matters)	Links environmental rights and human rights. Acknowledges that we owe an obligation to future generation. Establishes that sustainable development can be achieved only through the involvement of all stakeholders. Links government accountability and environmental protection. Focuses on interactions between the public and public authorities in a democratic context.	All
Convention on Biological Diversity <sup>15</sup> (1992)	Sets the target to achieve by 2010 a significant reduction of the current rate of biodiversity loss. The Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets, forms the overarching framework on biodiversity.	Biodiversity
The Habitats Directive (92/43/EEC) <sup>16</sup>	Requires the protection of species and habitats of EU nature conservation designation. The Directive requires that development can only be allowed where it does not impact on important sites that protect habitats otherwise compensation measures must be put in place.	Biodiversity
The Birds Directive 2009/147/EC (codified version of 79/409/EEC) <sup>17</sup>	Provides for the protection of all naturally occurring wild bird species and their habitats, with particular protection of rare species. The Directive requires that measures are taken to preserve, maintain or re-establish a diversity of habitats for all the birds listed in Article I.	Biodiversity
Our life insurance, our natural capital: an EU biodiversity strategy to 2020 COM(2011) 244 final	Headline target is to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and to restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.	Biodiversity
The European Landscape Convention 2000 (signed 2006) <sup>18</sup>	Promotes various actions at the landscape scale ranging from strict conservation through protection, management and improvement to creation.	Biodiversity, Material Assets and Cultural Heritage

<sup>15</sup> For further information visit: <http://www.cbd.int/default.shtml>

<sup>16</sup> Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna accessible via: <http://ec.europa.eu/environment/nature/legislation/habitatsdirective/>

<sup>17</sup> Council Directive 2009/147/EC on the conservation of wild birds (codified version of 79/409/EEC)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

Plan	Key Messages	SEA Topics
Air Quality Directive (2008/50/EC) <sup>19</sup> and Air Quality Standards Regulations (2010) <sup>20</sup>	The Directive on ambient air quality and cleaner air merged most existing legislation into a single directive and sets limits for concentrations of pollutants in outdoor air. The Air Quality Standards Regulations (2010) transpose into English law the requirements of Directives 2008/50/EC and 2004/107/EC on ambient air quality.	Air, Human Health, Biodiversity
The Industrial Emissions Directive (2010) Directive 2010/75/EU on Industrial Emissions (Integrated Pollution Prevention and Control)	Provides rules for the delivery of integrated prevention and pollution of pollution arising from industrial activities designed to prevent or, where not practical, reduce emissions into air, water and land as well as to prevent the generation of waste to achieve a high level of protection of the environment. Emission limit values are set for substances harmful to air or water.	Not applicable
The Water Framework Directive (2000/60/EC) <sup>21</sup>	Promotes an integral and coordinated approach to water management at the river basin scale. Also encourages protection of soil and biodiversity. It aims to: Prevent deterioration of aquatic ecosystems and associated wetlands; Promote the sustainable use of water; Reduce pollution of water; and introduce a co-ordinated approach to water management based on the concept of river basin planning.	Biodiversity, Water
The Drinking Water Directive (1998) Directive 98/83/EC on the quality of water intended for human consumption	Seeks to protect public health by reducing the risk of the contamination of water intended or human consumption. Member States to set values for water intended for human consumption.	Water
The Floods Directive (2007/60/EC) on the assessment and management of flood risks	Aims to reduce and manage the risks that floods pose to human health, environment, cultural heritage and economic activity. Requires Member States to undertake a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. Where necessary flood risk maps are to be produced by 2013 with flood risk management plans focused on prevention, protection and preparedness being in place by 2015.	Water, Human Health, Biodiversity, Cultural Heritage
Urban Wastewater Treatment Directive (1991) <sup>22</sup>	Aims to protect the environment from the adverse effects of wastewater discharges through a requirement for the secondary treatment of urban wastewater.	Water
The Nitrates Directive (1991) Directive 91/676/EEC on nitrates from agricultural sources	Seeks reduction of water pollution caused or induced by nitrates from agricultural sources and prevent further pollution.	Water
Directive 99/31/EC, Landfill Regulations (2002) and Amendment	Prevents or reduces the negative effects from the landfilling of wastes upon the environment through various technical requirements. Also sets targets for the reduction of	Not applicable

18 [http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default\\_en.asp](http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp)

19 Air Quality Directive 2008/50/EC: [http://ec.europa.eu/environment/air/quality/legislation/existing\\_leg.htm](http://ec.europa.eu/environment/air/quality/legislation/existing_leg.htm)

20 Regulations transposing the Air Quality Directive are at: <http://www.legislation.gov.uk/ukSI/2010/1001/regulation/1/made>

21 Directive 2000/60/EC of the European Parliament and the Council establishing a framework for the Community action in the field of water policy accessible via: <http://ec.europa.eu/environment/water/water-framework/>

22 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1991L0271:20081211:EN:PDF>

Plan	Key Messages	SEA Topics
(2005) <sup>23</sup>	biodegradable wastes placed in landfill to 50% of the 1995 level in 2013 and 35% by 2020.	
The Waste Framework Directive (2008), Hazardous Waste Directive (1991) IPPC Directive (1996) and Landfill Directive (1999) <sup>24</sup>	Aims to ensure that all necessary measures have been taken to ensure that waste is recovered or disposed of without causing harm to human health or the environment	Human Health
The Packaging and Packaging Waste Directive (1994) Directive 94/62/EC on packaging and packaging waste	Seeks to reduce the environmental impact of packaging wastes by the harmonisation across Europe. Sets recovery rates for packaging materials	Not applicable
World Heritage Convention (1972) <sup>25</sup>	Calls for the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage sites.	Cultural Heritage
The Convention for the Protection for the Architectural Heritage of Europe (The Granada Convention) <sup>26</sup>	The main purpose of the Convention is to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among the Parties. It establishes the principles of "European co-ordination of conservation policies" including consultations regarding the thrust of the policies to be implemented.	Cultural Heritage
The European Convention on the Protection of Archaeological Heritage (The Valetta Convention) <sup>27</sup>	The revised Convention updates the provisions of a previous Convention (ETS No. 66) adopted by the Council of Europe in 1969. The new text makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies. It is concerned in particular with arrangements to be made for co-operation among archaeologists and town and regional planners in order to ensure optimum conservation of archaeological heritage. The Convention sets guidelines for the funding of excavation and research work and publication of research findings. It also deals with public access, in particular to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of the archaeological heritage.	Cultural Heritage
Adapting to Climate Change: Towards a European framework for Action (2009)	Promote strategies that increase the resilience to climate change of health, property and the productive functions of land, inter alia by improving the management of water resources and ecosystems. Framework for adaptation measures and policies to reduce the European Union's vulnerability to the impacts of climate change. The White Paper outlined the need for	Climate Change

<sup>23</sup> Council Directive 99/31/EC on the landfill of waste and the landfill (England and Wales) Regulations 2002 and Amendment Regulations 2005 accessible via: <http://www.opsi.gov.uk/SI/si2002/20021559.htm>

<sup>24</sup> Access to these directives is via: <http://ec.europa.eu/environment/waste/legislation/a.htm>

<sup>25</sup> <http://whc.unesco.org/en/conventiontext>

<sup>26</sup> <http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=121&CM=1&CL=ENG>

<sup>27</sup> <http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=143&CM=1&CL=ENG>



Plan	Key Messages	SEA Topics
	establishing a Clearing House Mechanism by 2011 that would enable exchanging information on climate risks, impacts and best practices between government, agencies and organisations working on adaptation policies.	
<b>National</b>		
Flood Risk Regulations (2009) (SI 3042)	Sets duty on Environment Agency and lead local flood authorities to prepare preliminary assessment maps and reports for river basin districts and flooding. A further duty is to identify flood risk areas and prepare flood risk management plans.	Not applicable
Flood and Water Management Act (2010) <sup>28</sup>	The Act Section 21 sets a duty on the Lead Local Flood Authority (LLFA) <sup>29</sup> to maintain a register of structures or features, and a record of information about each of those structures or features, which, in the opinion of the authority, are likely to have a significant effect on flood risk in its area helping to improve our understanding and management of local flood risk. Section 30 allows the Environment Agency, LLFAs and Internal Drainage Boards (IDBs) to designate natural or artificial features that are important for flood or coastal erosion risk management. The effect of a designation is that a feature may not be altered, replaced or removed without consent. A new regulation will require all LLFA's to assess all drainage designs prior to construction to determine whether the design meets national sustainable drainage standards.	Not applicable
National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England (2011) <sup>30</sup>	Sets out a statutory framework that will help communities, the public sector and other organisations to work together to manage flood and coastal erosion risk. Aim is to ensure that flooding and coastal erosion risks are well-managed and co-ordinated. The strategy covers flooding from the sea, rivers, surface water, sewers, groundwater and reservoirs.	Not applicable
Guidance for risk management authorities on sustainable development in relation to their flood and coastal erosion risk management (Defra, 2011) <sup>31</sup> .	Provides guidance on how authorities can contribute towards achievement of sustainable development when exercising flood and coastal erosion risk management functions, as required by the Flood and Water Management Act (2000)	Not applicable
Appraisal of flood and coastal erosion risk management (Defra, 2009) <sup>32</sup>	Sets out the principles that should guide decision making on the sustainable management of flood and coastal erosion risk in England. In particular it emphasises the need to ensure that appraisals for all activity (whether strategic level plans or individual projects):	Not applicable

<sup>28</sup> <http://www.legislation.gov.uk/ukpga/2010/29/contents>

<sup>29</sup> The Unitary or County Council for the area.

<sup>30</sup> <http://www.environment-agency.gov.uk/research/policy/130073.aspx>

<sup>31</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69447/pb13640-sdg-guidance.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69447/pb13640-sdg-guidance.pdf)

<sup>32</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69419/pb13278-erosion-manage-090619.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69419/pb13278-erosion-manage-090619.pdf)

Plan	Key Messages	SEA Topics
	<ul style="list-style-type: none"> <li>• Give more consideration to 'risk management' and 'adaptation', as opposed to only 'protection' and 'defence';</li> <li>• Are undertaken consistently, transparently, with value for money in mind and in a way that complies with the Treasury guidance on appraisal and evaluation in central Government (The Green Book);</li> <li>• Help achieve better social and environmental outcomes as part of sustainable development, both by considering a broader range of issues and by using a broader range of analysis techniques;</li> <li>• Adopt a risk-based approach, whilst considering impacts within the whole of a catchment or shoreline process area.</li> </ul>	
<p>Future Water – The Government's Water Strategy for England (Defra, 2008)<sup>33</sup></p>	<p>Recognises that poor surface water management can cause water quality problems. The Government vision for water policy and management is one where, by 2030 at the latest, we have:</p> <ul style="list-style-type: none"> <li>• Improved the quality of our water environment and the ecology which it supports, and continued to provide high levels of drinking water quality from our taps.</li> <li>• Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water.</li> <li>• Ensured a sustainable use of water resources, and implemented fair, affordable and cost reflective water charges.</li> <li>• Cut greenhouse gas emissions.</li> <li>• Embedded continuous adaptation to climate change and other pressures across the water industry and water users.</li> </ul>	<p>Water</p>
<p>Groundwater Protection Policy &amp; Practice (EA, 2006)</p>	<p>Protection of groundwaters.</p>	<p>Water</p>
<p>Groundwater (England and Wales) Regulations (2009)<sup>34</sup></p>	<p>Seeks to prevent or limit the input of pollutants into groundwater.</p>	<p>Water</p>
<p>Water Act 2003<sup>35</sup></p>	<p>Encourage more efficient use of water resources</p>	<p>Water</p>
<p>Water Environment (Water Framework Directive) (England and Wales)</p>	<ul style="list-style-type: none"> <li>• Aims to improve water quality and promote the sustainable use of all UK waterbodies, including coastal waters, estuaries and all inland waterbodies;</li> </ul>	<p>Water, Biodiversity</p>

<sup>33</sup> [http://www.official-documents.gov.uk/document/cm73/7319/7319.pdf?bcsi\\_scan\\_AB11CAA0E2721250=0&bcsi\\_scan\\_filename=7319.pdf](http://www.official-documents.gov.uk/document/cm73/7319/7319.pdf?bcsi_scan_AB11CAA0E2721250=0&bcsi_scan_filename=7319.pdf)

<sup>34</sup> [http://www.legislation.gov.uk/ukSI/2009/2902/pdfs/ukSI\\_20092902\\_en.pdf](http://www.legislation.gov.uk/ukSI/2009/2902/pdfs/ukSI_20092902_en.pdf)

<sup>35</sup> <http://www.legislation.gov.uk/ukpga/2003/37/contents>

Plan	Key Messages	SEA Topics
Regulations 2003 (SI 3242)	<ul style="list-style-type: none"> <li>• It requires all UK river basins to reach "good status" by 2015, through demanding environmental objectives, including chemical, biological and physical targets;</li> <li>• Charged the Environment Agency with production of River Basin Management Plans to be implemented by end of 2009;</li> <li>• Three types of UK water quality standards are being developed (a formal classification instrument should be completed in late 2007): Priority substances (and Priority Hazardous Substances); Specific Pollutants; and Physico-chemical pollutants.</li> </ul>	
Water for Life White Paper (2011)	<p>Recognises that water resources are already under pressure and that future changes such as climate change and demographic change, will exert further pressure. Government objectives include:</p> <ul style="list-style-type: none"> <li>• Paint a clear vision of the future and create the conditions which enable the water sector and water users to prepare for it</li> <li>• Deliver benefits across society through ambitious agenda for improving water quality, working with local communities to make early improvements on the health of our rivers by reducing pollution and tackling unsustainable abstraction</li> <li>• Work with water companies, regulators and other stakeholders to build understanding of the impact personal choices have on the water environment, water resources and costs;</li> <li>• Set out roles and responsibilities – including where Government will take a stronger role in strategic direction setting and assessing resilience to future challenges, as well as clear expectations on the regulators.</li> </ul>	Water, Biodiversity
Strategic Framework and Policy Statement on Improving the Resilience of Critical Infrastructure to Disruption from Natural Hazards (2010)	<p>Sets approach to managing risk to infrastructure:</p> <ul style="list-style-type: none"> <li>• Build a level of resilience into critical infrastructure assets that ensures continuity during a worst case flood event.</li> <li>• Considering the threat from current and future natural hazards in the design of new assets.</li> <li>• Increase the robustness and resilience of existing services or assets by building additional network connections.</li> <li>• Identifying key components and moving them out of harm's way.</li> <li>• Improved arrangements for sharing of information on infrastructure network performance and standards.</li> <li>• Enhancing skills and capabilities to respond to emergencies arising from natural hazards.</li> </ul>	Material Assets
National Infrastructure Plan (2010) <sup>36</sup>	<p>Forecasts a 20% increase in congestion by 2025 and requires a change to how infrastructure is planned, coordinated and delivered with adaptation to provide security and</p>	Material Assets

<sup>36</sup> HM Treasury, 2010: National Infrastructure Plan. Available at: [http://www.hm-treasury.gov.uk/ppp\\_national\\_infrastructure\\_plan.htm](http://www.hm-treasury.gov.uk/ppp_national_infrastructure_plan.htm)

Plan	Key Messages	SEA Topics
	resilience. Private sector capital is to be attracted and the cost of capital for projects needs to be reduced.	
Consultation Draft Waste Management Plan for England (2013)	Aims to deliver the objectives of the revised Waste Framework Directive: to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such waste. There are comprehensive waste management policies in England, which taken together deliver the above objectives, the core of this policy is therefore to bring current policies under the umbrella of one national plan.	Material Assets
Climate Resilient Infrastructure: Preparing for a Changing Climate (May, 2011)	A strategic approach to adapting national infrastructure that can be replicated at the sub-regional and local level by local authorities and the new Local Enterprise Partnerships (LEPs) (see paragraph 3.4.6) is described.	Material Assets
UK Climate Impacts Programme (2009)	Updated climate change projections based on three global emission scenarios provide forecasts for a climate and weather related impacts.	Material Assets
Climate Change: The Climate Change Act (2008) <sup>37</sup>	Requires that the average annual emissions in the carbon budget period including the year 2020 (i.e. the third period, 2018-2022) are at least 34% below the 1990 baseline. This is a 34% reduction by 2020. The 2008 Planning Act placed a duty on local authorities to include policies on climate mitigation and adaptation.	Material Assets
National Adaptation Plan (2013)	Meets the requirements of the Climate Change Act (2008). Objectives have been developed to address the greatest risks and opportunities: <ul style="list-style-type: none"> <li>• Increasing awareness;</li> <li>• Increasing resilience to current extremes;</li> <li>• Taking timely action for long-lead time measures; and</li> <li>• Addressing major evidence gaps.</li> </ul>	Material Assets
The Wildlife & Countryside Act (1981) as amended (most notably by the Countryside and Rights of Way (CRoW) Act <sup>38</sup> (2000)	Principal instrument for the protection of Sites of Special Scientific Interest and endangered wildlife within the UK. The CRoW Act aims for increased public access to the countryside and strengthens protection for wildlife.	Biodiversity
Biodiversity 2020: A Strategy for England's wildlife and ecosystem services (2011) <sup>39</sup>	Ensures biodiversity considerations become embedded in all the main sectors of economic activity, public and private. It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.	Biodiversity

<sup>37</sup> Available online at: [http://www.opsi.gov.uk/acts/acts2008/ukpga\\_20080027\\_en\\_1](http://www.opsi.gov.uk/acts/acts2008/ukpga_20080027_en_1) (accessed 18 February 2014)

<sup>38</sup> <http://www.jncc.gov.uk/page-1377>

<sup>39</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf)

Plan	Key Messages	SEA Topics
Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network (Defra, 2010)	Sets out five approaches to deliver a coherent, resilient ecological network: <ul style="list-style-type: none"> <li>• improve the quality of current site by better habitat management;</li> <li>• increase the size of current wildlife sites;</li> <li>• enhance connections between, or join up, sites wither through physical corridors, or though 'stepping tones';</li> <li>• create new sites; and</li> <li>• reduce the pressures on wildlife by improving the wider environment, including through buffering wildlife sites.</li> </ul>	Biodiversity
The Natural Choice: Securing the Value of Nature. The Natural Environment White Paper. (HM Government, 2011)	Sets out the Government's plans to ensure the natural environment is protected and fully integrated into society and economic growth. Sets out four key aims: <ul style="list-style-type: none"> <li>• protecting and improving our natural environment;</li> <li>• growing a green economy;</li> <li>• reconnecting people and nature; and</li> <li>• international and EU leadership.</li> </ul>	Biodiversity
UK National Ecosystem Assessment (2011)	The first analysis of the UK's natural environment and the benefits it provides to society and economic prosperity. The assessment leads on from the Millennium Ecosystem Assessment (2005) analyses services provided by ecosystem against eight broad habitat types. The ecosystem services provided by these habitat types have been assessed to find their overall condition.	Biodiversity
Ancient Monuments and Archaeological Areas Act (1979) <sup>40</sup>	Provides for nationally important archaeological sites to be statutorily protected as "Scheduled Ancient Monuments" (now Scheduled Monuments)/	Cultural Heritage
Planning (Listed Buildings and Conservation Areas) Act (1990) <sup>41</sup>	Provides specific protection for buildings and areas of special architectural or historic interest	Cultural Heritage
The Government White Paper: Heritage Protection for the 21st Century (2007) <sup>42</sup>	To put the historic environment at the heart of the planning system.	Cultural Heritage
The Historic Environment: A Force for Our future (2001)	Sets out the intention to protect the historic environment as in contribution to the economy.	Cultural Heritage
Climate Change and the Historic environment (2008)	Sets out English Heritage's current views on the implications of climate change for the historic environment. It recognises that adaptations and mitigation to address the causes and	Cultural Heritage

<sup>40</sup> <http://www.legislation.gov.uk/ukpga/1979/46>

<sup>41</sup> <http://www.legislation.gov.uk/ukpga/1990/9/contents>

<sup>42</sup> <https://www.gov.uk/government/publications/heritage-protection-for-the-21st-century-white-paper>

Plan	Key Messages	SEA Topics
	consequences of climate change can have a damaging effect on historic buildings, sites and landscapes.	
The UK Climate Change Programme (2006) <sup>43</sup> and the Climate Change Act (2008) <sup>44</sup>	A suite of new and established measures to reduce UK carbon emissions to 15-18% below 1990 levels by 2010. Also promotes anticipatory adaptation. The Climate Change Act legislates for climate change mitigation and adaptation. It sets the requirements for the Climate Change Risk Assessment, the National Adaptation Programme and the Adaptation Reporting Power.	Biodiversity, Material Assets and Cultural Heritage
Countryside and Rights of Way Act (2000)	Provides for public access on foot to certain types of land, amends the law relating to public rights of way, increases protection for Sites of Special Scientific Interest and strengthens wildlife enforcement legislation as well as provides for the management of Areas of Outstanding Natural Beauty.	Biodiversity, Human Health
Waste Strategy for England (2007) <sup>45</sup>	Promotes best practicable environmental option (BPEO), the waste hierarchy and the proximity principle. The strategy sets out an overall objective for England to achieve less waste, more material recovery, energy from waste and much less landfill.	Material assets
Healthy Lives: Healthy People: Our Strategy for Public Health in England (Department of Health, 2010)	Helping people live longer and reduce health inequalities.	Human Health
Natural Environment and Rural Communities Act (2006) <sup>46</sup>	Promote and enhance biodiversity. The Act stresses that biodiversity conservation should not be viewed solely as an environmental issue, but a core component of sustainable development, which underpins economic development and prosperity and offers a range of quality of life benefits across a range of local authority service areas.	Biodiversity
National Planning Policy Framework (2012) <sup>47</sup>	Sets out how planning should contribute to sustainable development. The Government is committed to protecting and enhancing the quality of the natural and historic environment, in both rural and urban areas. A high level of protection should be given to most valued townscapes and landscapes, wildlife habitats and natural resources. Those with national and international designations should receive the highest level of protection. Development plan policies should take account of environmental issues such as the potential impact of the environment on proposed developments by avoiding new development in areas at risk of flooding, and as far as possible, by accommodating natural hazards and the impacts of climate change.	All

43 [http://incc.defra.gov.uk/pdf/BRAG\\_CC\\_ClimateChangeTheUKProgramme.pdf](http://incc.defra.gov.uk/pdf/BRAG_CC_ClimateChangeTheUKProgramme.pdf)

44 <http://www.legislation.gov.uk/ukpga/2008/27/contents>

45 <http://archive.defra.gov.uk/environment/waste/strategy/strategy07/documents/waste07-strategy.pdf>

46 <http://www.legislation.gov.uk/ukpga/2006/16/contents>

47 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)

Plan	Key Messages	SEA Topics
	Proactive strategies should be adopted to mitigate and adapt to climate change, taking full account of flood risk and water supply and demand considerations.	Biodiversity, Material Assets and Cultural Heritage
	The planning system should contribute to and enhance the natural and local environment by: <ul style="list-style-type: none"> <li>recognising the wider benefits of ecosystem services;</li> <li>minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.</li> </ul>	Biodiversity
	Heritage assets are an irreplaceable resource and should be conserved in a manner appropriate to their significance.	Cultural Heritage, Material Assets
	Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities.	Biodiversity, Human Health, Material Assets and Cultural Heritage
	The planning system should contribute to and enhance the natural and local environment by: <ul style="list-style-type: none"> <li>preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability</li> </ul>	Water
	Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change.	Biodiversity, Cultural Heritage, Material Assets, Water
Laying the Foundations: A Housing Strategy for England (DCLG, 2011)	Supports the delivery of new homes and improvement of social mobility.	Material Assets
Delivering Affordable Housing (DCLG, 2006)	Supports local authorities and others in delivering high quality affordable housing within mixed sustainable communities.	Not applicable
Planning Policy for Traveller Sites (DCLG, 2012)	Set out the following Government aims for traveller sites: <ul style="list-style-type: none"> <li>That local planning authorities should make their own assessment of need for the purpose of planning;</li> <li>Ensure that local planning authorities work collaboratively to develop strategies to meet needs through the identification of land for traveller sites.</li> </ul>	Not applicable

Plan	Key Messages	SEA Topics
Securing the Future: UK Government Sustainable Development Strategy (2005) <sup>48</sup>	This replaced an earlier strategy published in 1999 and aims to enable people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations	All
Rural White Paper (2000) Our Countryside: The Future – A fair Deal for Rural England.	Promotes sustainable rural economies with the objective of maintaining and stimulating secure access to services and employment as well as conserving and enhancing rural landscapes.	Not applicable
Urban White Paper (2000) Our Towns and Cities: The Future – Delivering an Urban Renaissance	Seeks to encourage more sustainable and attractive urban areas to retain people in urban areas. Sets target of 60% of new homes to be on brownfield sites.	All
The UK Renewable Energy Strategy (DECC, 2009)	Promotes increased use of renewable electricity and heat as well as promotes a low-carbon economy, energy security to address climate change. Sets target of 15% of energy to be from renewable sources by 2020 with reduced CO <sub>2</sub> emissions by 750 Mt by 2030.	Material assets
<b>Regional</b>		
The London Plan (2011)	. London Boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.  Strategic planning in London is the shared responsibility of the Mayor of London, 32 London boroughs and the Corporation of the City of London. Under the legislation establishing the Greater London Authority (GLA), the Mayor has to produce a spatial development strategy (SDS) – which has become known as 'the London Plan' – and to keep it under review. It is the overall strategic plan for London, setting out a fully integrated economic, environmental, transport and social framework for the development of London to 2036. Boroughs' local development documents have to be 'in general conformity' with the London Plan, which is also legally part of the development plan that has to be taken into account when planning decisions are taken in any part of London unless there are planning reasons why it should not.	All
All London Green Grid Supplementary Planning Guidance (SPG) (2012)	Aims to promote the concept of green infrastructure, and increase its delivery by boroughs, developers, and communities, by describing and advocating an approach to the design and management of green and open spaces to deliver unrealised benefits. These benefits include sustainable travel, flood management, healthy living, and creating distinctive destinations; and the economic and social uplift these support.	Biodiversity, Material Assets and Cultural Heritage

<sup>48</sup> <https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy>



Plan	Key Messages	SEA Topics
Open Space Strategies Best Practice Guidance (BPG) (2004)	Best practice guidance to the London Plan on the methodology and content of an Open Space Strategy within the London context. It provides advice on assessing the quantity and quality of open spaces and in identifying the needs of local communities and other users of open spaces. It also suggests ways of promoting open space improvements, including funding, the use of planning obligations and how to effectively engage the local community and establish collaborative partnerships.	Biodiversity, Material Assets and Cultural Heritage
London's World Heritage Sites - Guidance On Settings Supplementary Planning Guidance (SPG) (2012)	<p>Its purpose is to support the implementation of Policy 7.10 of the London Plan by providing:</p> <ul style="list-style-type: none"> <li>• A consolidated source of information on understanding World Heritage Sites and their settings in the context of London;</li> <li>• A discussion of the elements of setting that contribute to the appreciation of Outstanding Universal Value that should be considered by policy makers, developers and other stakeholders to ensure World Heritage Sites and their settings are conserved and enhanced;</li> <li>• An assessment framework with a stepped approach to assess the effect of development proposals and proposals for change in plan making on London's World Heritage Sites and their settings.</li> </ul>	Cultural Heritage
Royal Botanic Gardens, Kew World Heritage Site Management Plan (2011)	The primary purpose of the Kew World Heritage Site (WHS) Management Plan is to set out a framework for the management of the WHS to ensure conservation of its Outstanding Universal Value and continued sustainable use, and the continued maintenance of its heritage whilst also introducing new displays, facilities and interpretation representing the role of Kew Gardens in the 21st century.	Cultural Heritage
London Rivers Action Plan (2009)	Provides a delivery mechanism to take forward London's river restoration strategies - "River restoration - a stepping stone to urban regeneration highlighting the opportunities in South London" (2002). The main aim of the LRAP is to provide a forum for identifying stretches of river that can be restored. This can be done by improving river channel or riparian habitats, by removing or modifying flood defence structures where safe to do so, or by reclaiming 'lost' rivers currently buried under the Capital's surface.	Biodiversity, Water
Securing London's Water Future. The Mayors Water Strategy (2011)	<p>The Mayor's Water Strategy is intended to complement the plans and strategies of other organisations, including the national water strategy, by presenting a London specific view of water management. Its goal is improved water management in terms water supply, wastewater and flooding. Its objectives are:</p> <ul style="list-style-type: none"> <li>• To use the water London already has more effectively and efficiently.</li> </ul>	Water

Plan	Key Messages	SEA Topics
	<ul style="list-style-type: none"> <li>To minimise the release of untreated wastewater and diffuse pollution into the water environment.</li> <li>To manage, and where possible reduce, the threat of flooding to people and their property.</li> <li>To reduce the greenhouse gas emissions produced from supplying water and treating wastewater.</li> </ul>	
Thames Catchment Flood Management Plan (2009)	Produced by the Environment Agency, they give an overview of the flood risk across each river catchment and recommend ways of managing those risks now and over the next 50-100 years. All types of inland flooding are considered, such as flooding from rivers, ground water, surface water and tidal flooding. The plans take into account the likely impacts of climate change, the effects of water usage and how areas could be developed to meet present day needs without compromising the ability of future generations to meet their own needs.	Water and Material Assets
TE2100 Flood Risk Management Plan (2012)	The Thames Estuary 2100 project was established by the Environment Agency in 2002 with the aim of developing a strategic flood risk management plan for London and the Thames estuary through to the end of the century. Primarily looks at tidal flooding, though other sources of flooding including high river flows as a result of heavy rainfall and surface water flooding are considered. The key driver was to consider how tidal flood risk was likely to change in response to future changes in climate and people and property in the floodplain. It makes recommendations on what actions are needed to adapt to a changing estuary.	Water and Material Assets
Thames River Basin Management Plan (RBMP) (2009)	The plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater.	Water
Wandle Catchment Plan: Vision (2013)	The Vision has four aims; habitat and wildlife, water, good access and engagement. The next step will be to produce an Action Plan. This will support the Vision by detailing what will need to be done to achieve the overall aims to improve the river, now and for the future, and it will guide the many organisations working in the Wandle valley. The Action Plan will feature the advice of technical experts as well as the local community to ensure that the Plan is scientifically robust as well as locally relevant. Together, the Vision and the Action Plan will complete the Catchment Plan.	Water and Biodiversity

Plan	Key Messages	SEA Topics
Beverley Brook Information Pack (2013)	Summarises the key issues in the Beverley catchment, including non-native species, pollution, flow, water level and morphology. It provides a snapshot of the latest findings from the Environment Agency's rolling programme of scientific investigations and is updated annually.	Water and Biodiversity
London Biodiversity Action Plan 2015-20	Identifies priority habitats that are of particular importance for biodiversity in London. The London BAP contains targets to enhance and to increase the extent of priority habitats found in the capital by 2015 and by 2020. These targets have been incorporated into the London Plan.	Biodiversity
Development Plan Policies for Biodiversity Best Practice Guidance (BPG) (2005)	This Best Practice Guidance is intended to assist boroughs with the preparation of planning policy for biodiversity in Local Development Documents (LDDs). Biodiversity should be considered at the very start of the process when developing a vision and objectives for the borough in plans and policies, including the Community Strategy. LDDs must be in general conformity with the London Plan. The model policies in this guide are designed to assist boroughs in ensuring that development plans meet this requirement in respect of biodiversity.	Biodiversity
The Mayor's Biodiversity Strategy – Connecting with London's Nature (2002)	Aims to protect and enhance the natural habitats of London together with their variety of species. The Strategy sets out the Mayor's vision for the future, identifying the key issues and providing innovative solutions. It demonstrates how London's biodiversity can be maintained as a crucial part of a sustainable world city.	Biodiversity
Revised London Housing Strategy (2011)	Seeks to offer a comprehensive overview of housing, encompassing not just affordable housing, but housing across all tenures, and not just housing delivery programmes, but meeting housing need in its broadest sense.	Material Assets
The Mayor's Transport Strategy (2010)	A statutory document, developed alongside the London Plan and Economic Development Strategy as part of a strategic policy framework to support and shape the economic and social development of London over the next 20 years. It sets out the Mayor's transport vision and describes how Transport for London (TfL) and its partners, including the London boroughs, will deliver that vision.	Material Assets
The Mayor's Economic Development Strategy (2010)	Sets out the Mayor's vision with respect to London's economy. To encourage the conditions and business environment in which London's economy can thrive, continued investment in the capital and resisting changes that would damage its open and dynamic environment, encourage businesses and organisations to work together and to pool resources towards common goals, maintain and enhance the conditions that allow the people and communities of London to use the creativity and initiative that have contributed	Material Assets

Plan	Key Messages	SEA Topics
	so much to London's success.	
The Mayor's Municipal Waste Management Strategy (2011)	Provides a framework of policies and proposals to ensure London makes an effective contribution towards meeting the UK's commitments under the Landfill Directive 1999. The Mayor's policies and proposals contained in the strategy provide a clear lead to London's waste authorities on the actions it is expected they will need to undertake to meet the Mayor's objectives and targets for London's municipal waste management.	Material Assets
South London Waste Plan (2012)	Sets out the partner boroughs' (Croydon, Kingston Upon Thames, Merton and Sutton) long-term vision, spatial strategy and policies for the sustainable management of waste over the next 10 years. The Waste Plan contains policies to promote the adequate provision of modern, high quality, clean and well-run waste management facilities (including for disposal) on the most suitable sites and areas in the partner boroughs.	Material Assets
Adapting to climate change – Creating natural resilience (2009)	Aims to understand how London's valued plants and animals and the green spaces they inhabit may be affected by climate change. It proposes climate change adaptation measures and identifies policy and other responses to maximise benefits for wildlife and green spaces.	Biodiversity, Climate Change
<b>Local</b>		
London Borough of Croydon Local Plan: The Croydon Local Plan: Strategic Policies (CLP1) (2013) The Croydon Local Plan: Detailed Policies and Proposals (CLP2) (underway)	Formerly known as the core strategy. This comprises Croydon's local plan: strategic policies, the Mayor's London plan, the saved policies from Croydon's unitary development plan (UDP) of 2006 and the South London waste plan.  The strategic policies are the first part of the Croydon local plan. They provide the strategic direction and support the plan's vision for enabling future development in the Borough from now until 2031, in terms of homes, shops, jobs, schools, hospitals, leisure and recreation. The Croydon local plan: strategic policies development plan document (DPD), also includes policy for the protection and conservation of natural and built environment and response to the impacts of climate change.	All
London Borough of Sutton Local Development Framework: Adopted Core Planning Strategy and Proposals Map (2009) Adopted Site Development Policies (2012)	The Core Planning Strategy sets out the Council's long-term vision, spatial strategy and core policies for shaping the future development of the Borough and managing change over the next 15 years in line with the principles of sustainable development.  The Vision of Sutton as a sustainable suburb within London is underpinned by five Themes, and have been translated into a set of 19 Strategic Objectives. The five themes include; <ul style="list-style-type: none"> <li>Developing Active, Healthy and Inclusive Communities.</li> </ul>	All

Plan	Key Messages	SEA Topics
	<ul style="list-style-type: none"> <li>Achieving Environmental Sustainability.</li> <li>Encouraging Enterprise and Employment.</li> <li>Promoting Sustainable Transport and Accessibility.</li> <li>Improving the Streetscene and Living Environment.</li> </ul> <p>Sutton Town Centre, Hackbridge and Wallington have been identified as areas for growth and regeneration.</p>	
<p>London Borough of Merton Local Plan: Adopted Core Planning Strategy (2011) Draft Sites and Policies Plan (2013) Proposals Map</p>	<p>The Core Strategy sets out the spatial strategy for the borough and the key elements of the planning framework. It brings together other strategies that cover Merton - such as the Neighbourhood Renewal Strategy, Open Space Strategy and the NHS "Better healthcare, closer to home" strategy to provide a co-ordinated long term spatial vision and means to deliver that vision.</p> <p>Merton's Spatial Vision is to be a leader in addressing the challenges of climate change and have tackled imbalances between different parts of Merton, while protecting what is good and valued.</p> <p>There are eight Strategic Objectives and associated principles.</p> <p>Wimbledon, Mitcham, Morden and Colliers Wood have been identified as areas for growth and regeneration.</p>	<p>All</p>
<p>London Borough of Richmond Upon Thames Local Development Framework: Adopted Core Strategy (2009) Adopted Development Management Plan (2011) Adopted Twickenham Area Action Plan Site Allocations Plan (underway)</p>	<p>The strategy starts from an overall vision of what the plan is trying to achieve. A series of objectives build on the vision for different types of development and for different parts of the Borough. These form the basis for the strategic policies aimed at ensuring the objectives are implemented.</p> <p>The Local Development Framework vision has 3 inter-related themes of 'A Sustainable Future', 'Protecting Local Character' and 'Meeting People's Needs'. The three themes are continued and linked through the Core Strategy.</p> <ul style="list-style-type: none"> <li>Sustainable future: Six core polices including adapting to climate change and biodiversity.</li> <li>Protecting Local Character: Six core policies including maintaining and improving the local environment, and open land and parks.</li> <li>Meeting Peoples Need: Eight core policies including housing, and health and well-being.</li> </ul> <p>The spatial strategy reinforces Richmond's role as an outer London Borough with a high quality urban and historic environment and open landscape, and as a sport and tourist destination. Areas identified for regeneration include Castlenau, Ham, Hampton Nursery</p>	<p>All</p>

Plan	Key Messages	SEA Topics
<p>London Borough of Kingston Upon Thames Local Development Framework: Adopted Core Strategy (2012) Kingston Town Centre Area Action Plan (underway) Hogsmill Valley (underway)</p>	<p>Lands, Heathfield and Mortlake.</p> <p>It sets a clear vision, closely aligned with the Kingston Plan (2008-2020) (the Borough's Sustainable Community Strategy), as to how the Borough should look and function and how development needs will be met up to 2027. To ensure that the Core Strategy contributes to achieving the Kingston Plan objectives, the Core Strategy objectives and policies are aligned with the three themes.</p> <p>The Kingston Plan Vision: <i>'To be a place where people are happy, healthy and enjoy a good quality of life, in a safe and tolerant environment, where business is prosperous, and where everyone in the community can contribute to Kingston's success and reach their own full potential.'</i></p> <p>Themes:</p> <ul style="list-style-type: none"> <li>• A Sustainable Kingston: protecting and enhancing the environment for us and for future generations.</li> <li>• Prosperous and Inclusive: sharing prosperity and opportunity.</li> <li>• Safe, Healthy and Strong: preventing problems and promoting responsibility and independence.</li> </ul> <p>Key Areas of Change have been identified as Kingston Town Centre, Tolworth Regeneration Area and Hogsmill Valley.</p>	<p>All</p>
<p>London Borough of Wandsworth Local Plan: Adopted Core Strategy (2010) Adopted Development Management Policies Document (2012) Adopted Site Specific Allocations Document (2012) Adopted Proposals Maps (2012)</p>	<p>The Core Strategy aims to make provision to meet needs for housing, business, community services and infrastructure, in a sustainable way, protecting and improving both the built and the natural environments while mitigating climate change</p> <p>To achieve this vision the Council has set strategic objectives in three key areas and options in the Core Strategy have been tested against these objectives. Sustainable development is the overriding principle.</p> <ul style="list-style-type: none"> <li>• Environmental Objectives such as protecting and enhancing open spaces and the natural environment, and managing the consequences and reducing the risk of flooding.</li> <li>• Social Objectives such as creating safer, healthier and more secure communities.</li> <li>• Economic Objectives such as securing regeneration in areas of deprivation to reduce poverty and social exclusion.</li> </ul> <p>Regeneration areas have been identified as the Thames Riverside, the town centres and the Vauxhall/Nine Elms/Battersea Opportunity Area.</p>	<p>All</p>
<p>Croydon's Open Space Strategy (2005-</p>	<p>Provide clear objectives and a framework by which Councils can effectively manage,</p>	<p>Biodiversity and Material Assets</p>

Plan	Key Messages	SEA Topics
10) Kingston Upon Thames Green Space Strategy (2008-18) Merton's Open Space Strategy (2010/11) Richmond's Parks and Open Spaces Strategy Sutton's Open Space Strategy (2007) Wandsworth's Parks Strategy	<p>maintain and enhance the Open Space network of each Borough.</p> <p>help focus resources efficiently and effectively on land that is owned or managed by the Council on behalf of others. There will always be a demand for open space. The challenge is to make its availability and management relevant to people's needs. This strategy provides a framework for the maintenance and enhancement of the Green Spaces thus seeking to meet people's needs and expectations of the Borough's Green Spaces</p>	
London Borough of Croydon Surface Water Management Plan (2011) London Borough of Kingston Upon Thames Surface Water Management Plan (2011) London Borough of Merton Surface Water Management Plan (2011) London Borough of Richmond Upon Thames Surface Water Management Plan (2011) London Borough of Sutton Surface Water Management Plan (2011) London Borough of Wandsworth Surface Water Management Plan (2011)	<p>Delivered as part of the Drain London Project. Individual plans for each Borough which outlines the preferred surface water management strategy for each Borough and includes consideration of flooding from sewers, drains, groundwater and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall.</p>	All
London Borough of Croydon Level 1 & 2 Strategic Flood Risk Assessment (2008 & 2009) London Borough of Kingston Upon Thames Level 1 Strategic Flood Risk Assessment 2008) London Borough of Merton Level 1 & 2 Strategic Flood Risk Assessment (2008 & 2009) London Borough of Richmond Upon Thames Strategic Flood Risk	<p>A Level 1 SFRA provides an overview of the flood risk issues within each Borough to enable application of the Sequential Test by the individual Boroughs. Flooding from different sources including river flooding, tidal flooding, sewer, groundwater and surface water flooding are all assessed within the SFRA.</p> <p>A Level 2 SFRA provides supplementary information to the Level 1 SFRAs, to inform on flood risks associated with allocation sites that may require the Exception Test as identified in the respective Sequential Test.</p> <p>Level 2 mapping compliments that produced in the Level 1 SFRAs, to provide a complete suite of flood mapping from all sources, based on available data. The Level 1 and 2 reports should be used in conjunction with each other for both forward strategic planning and to</p>	All

Plan	Key Messages	SEA Topics
Assessment (2008)	inform ongoing development control decisions.	
London Borough of Sutton Level 2 Strategic Flood Risk Assessment (2009)		
London Borough of Wandsworth Level 1 & 2 Strategic Flood Risk Assessment (2008 & 2009)		
London Borough of Croydon Preliminary Flood Risk Assessment (2011)	Provides a high level summary of significant flood risk within each Borough describing both the probability and harmful consequences of past and future flooding. The scope of a PFRA is to consider flooding from the following sources; surface runoff, groundwater, sewers and ordinary watercourses and any interaction these have with main rivers and the sea.	
London Borough of Kingston Upon Thames Preliminary Flood Risk Assessment (2011)		
London Borough of Merton Preliminary Flood Risk Assessment (2011)		
London Borough of Richmond Upon Thames Preliminary Flood Risk Assessment (2011)		All
London Borough of Sutton Preliminary Flood Risk Assessment (2011)		
London Borough of Wandsworth Preliminary Flood Risk Assessment (2011)		
London Borough of Croydon Joint Strategic Needs Assessment (2012/13)	A systematic method of reviewing the health and well-being of a population, leading to agreed commissioning priorities that will improve health and wellbeing outcomes and reduce inequalities	
London Borough of Kingston Upon Thames Joint Strategic Needs Assessment (2010-11)		
London Borough of Merton Joint Strategic Needs Assessment (2013)		All
London Borough of Richmond Upon Thames Joint Strategic Needs Assessment (2010-12)		
London Borough of Sutton Joint Strategic Needs Assessment (2013)		
London Borough of Wandsworth Joint		



Plan	Key Messages	SEA Topics
Strategic Needs Assessment (2010)		
Health Profiles (2013) for the London Boroughs of Croydon, Kingston Upon Thames, Merton, Richmond Upon Thames, Sutton and Wandsworth	Gives a picture of health within a particular administrative area. It is designed to help local government and health service understand community's needs, and ways that they can work to improve people's health and reduce health inequalities.	Human Health

## APPENDIX B – SCOPED IN TOPICS AND SUSTAINABILITY THEMES

Sustainability Themes	Scoping Stage	Scoping Update	Reason
<b>HUMAN HEALTH - Population</b>			
Population Growth	Out	In	Increasing population could place increased development pressures upon areas at risk of flooding.
Increasing population of children	Out	Out	Covered under the population growth, housing allocations and schools themes.
Increasing population of those over the age of 75	Out	Out	Covered under the population growth, housing allocations and residential care homes themes.
<b>HUMAN HEALTH - Deprivation</b>			
Address cycle of deprivation	In	In	Reduced flood risk may reduce some of the barriers for business investment.
Retain well educated workforce	Out	Out	Management of flood risk is unlikely to affect levels of deprivation.
Access to services	Out	Out	Access to services is unlikely to be compromised.
<b>HUMAN HEALTH - Public Health</b>			
Elderly safety	In	In	Reducing risk of flooding to those with long term illness where supported evacuation could be needed.
Emotional stress	In	In	Raising awareness and enabling communities to help themselves can reduce fear of flooding and inform individuals on how to prepare for a flood incident.
Physical injuries	In	In	Raising awareness and reducing flood risk can help towards preventing injuries associated with flooding.
Spread of disease and exposure to contaminated water	In	In	Reducing flood risk and raising awareness may help to reduce the spread and exposure to contaminated water.
Obesity in adults and children	Out	Out	The creation of flood alleviation measures is unlikely to lead to the creation of new open space, which may assist in the reduction of obesity through the provision of recreational areas.
Mobility and access to services	Out	Out	Flood risk is unlikely to affect access to key services except potentially for extreme events.
Fuel poverty	Out	Out	No effects upon fuel poverty are anticipated.
<b>HUMAN HEALTH - Crime and Safety</b>			
Reported burglary	Out	Out	Flood management measures are unlikely to affect the profiles of burglary or crime.
Violence	Out	Out	
<b>BIODIVERSITY</b>			
Nationally designated sites	In	In	Designated sites within the study area identified at being at risk of local flooding and/or are water dependent.
Locally designated sites	In	In	Due to the large number of SINC's within the study area, it is likely that some designated sites are at risk of local flooding

Sustainability Themes	Scoping Stage	Scoping Update	Reason
			and/or are water dependent.
Non-designated sites	In	In	Due to the large number of non-designated sites within the study area, it is likely that some sites are at risk of local flooding and/or are water dependent. Also covers the Wandle Valley Regional Park which passes through Croydon, Sutton, Merton and Wandsworth.
Water dependent LBAP habitats and species	In	In	The Strategies measures have the potential to affect habitats and species by altering flow levels to water dependent habitats. There is also potential for habitat enhancement.
Habitat fragmentation	In	In	Flood reduction measures have the potential to positively and negatively alter habitat connectivity.
Wildlife disturbance	Out	Out	More appropriately addressed at a project scale when detailed information concerning design of flood measures is available.
National Parks	Out	Out	No National Parks within the study area.
<b>WATER – Surface Water</b>			
Surface water quality	In	In	On the ground measures have the potential to influence water quality both adversely and beneficially, through the change in polluted urban runoff and sediment runoff.
Hydromorphology	In	In	On the ground measures could have positive or negative effects on flow, and physical form of channels.
Flood Risk	Out	Out	The Strategies themselves address flood risk and assess flood risk in SEA context in relation to how these changes affect other receptors.
<b>WATER – Ground Water</b>			
Ground water quality	N/A	In	Flood prevention measures have the potential to influence groundwater quality. Some restrictions may apply to certain measures.
Source Protection Zones	N/A	In	Flood prevention measures have the potential to influence availability and flow of groundwater. Some restrictions may apply to certain measures.
<b>MATERIAL ASSETS - Community Services</b>			
Hospitals	In	In	More vulnerable infrastructure located within the study area identified as being at risk of local flooding.
Residential care homes	In	In	Households located within the study area identified as being at risk of local flooding.
Emergency services	In	In	Highly vulnerable infrastructure located within the study area identified as being at risk of local flooding.
Prisons/secured residential institutions	N/A	In	More vulnerable infrastructure located within the study area identified as being at risk of local flooding.
Schools	In	In	More vulnerable infrastructure located within the study area identified as being at risk of local flooding.
<b>MATERIAL ASSETS - Housing</b>			
Existing housing	In	In	Over 90,000 existing homes across the study area are considered to be at risk of local flooding.

Sustainability Themes	Scoping Stage	Scoping Update	Reason
Housing allocations	In	In	With over 49,000 new homes planned across the study area, it can be assumed that a proportion will be at risk of local flooding.
Existing and future housing design	In	In	Retrofitting existing homes and ensuring suitable design of new housing stock to reduce risk and potential effects of local flooding, and effects of climate change.
<b>MATERIAL ASSETS - Economy</b>			
Existing employment areas	In	In	Over 6,000 existing commercial/industrial units across the study area are considered to be at risk of local flooding.
Proposed business areas	In	In	Proposed employment areas are at risk of local flooding.
<b>MATERIAL ASSETS - Agriculture and land use</b>			
Open space/ parks/recreation areas	In	In	Due to the number of open spaces, parks and recreation areas across the study area, it can be assumed that some are at risk from local flooding. Potential to positively and negatively alter the character and quality of such spaces.
Agricultural areas	Out	Out	Extent of agricultural area across the study area is small and fragmented. Unlikely to be affected by measures.
<b>MATERIAL ASSETS - Waste Management</b>			
Waste management and energy recovery	In	In	More vulnerable infrastructure located within the study area identified as being at risk of local flooding. Potential for spread of contaminants.
Recycled materials processing	In	In	More vulnerable infrastructure located within the study area identified as being at risk of local flooding. Potential for spread of contaminants.
<b>MATERIAL ASSETS - Water Supply and Waste Water Treatment</b>			
Water supply	In	In	Kenley WTW's in Croydon is located within a Critical Drainage Area. It is at risk of surface water and ground water flooding.
Waste water treatment	Out	Out	No STW's are located within Critical Drainage Areas.
<b>MATERIAL ASSETS - Transport Infrastructure</b>			
Road and rail services	In	In	Essential infrastructure located within the study area identified as being at risk of local flooding. Potential for damage to infrastructure and reduced accessibility.
Broadband communications equipment	Out	Out	More appropriately addressed at a project scale.
<b>MATERIAL ASSETS - Energy Supply</b>			
Power and transmission networks	In	In	There are records of power infrastructure located in Critical Drainage Areas and therefore at risk of surface water flooding.
Renewable energy	Out	Out	Due to the small scale nature and spread of renewable energy sources across the study area, it is considered that this theme is more appropriately addressed at a project scale.
<b>MATERIAL ASSETS - Adaptation to Climate Change</b>			

Sustainability Themes	Scoping Stage	Scoping Update	Reason
Adaptation/resilience	In	In	Climate change is anticipated to increase the risk of local flooding.
<b>CULTURAL, ARCHITECTURAL AND ARCHAEOLOGICAL HERITAGE</b>			
Scheduled Ancient Monuments (SAMs)	In	In	Due to the number of SAMs across the study area, it is likely that some are at risk from local flooding. Also potential for improved access.
Historic parks & gardens	In	In	Due to the number of historic parks and gardens across the study area, it is likely that some are at risk from local flooding. Also potential for improved access.
Conservation Areas	In	In	Due to the number of conservation areas across the study area, it is likely that some are at risk from local flooding. Also potential for improved access.
Listed Buildings	In	In	Due to the number of listed buildings across the study area, it is likely that some are at risk from local flooding. Also potential for improved access.
Key views	In	In	One key view exists in Richmond. Flood mitigation measures may potentially impact on key views.
Archaeological Priority Zones	N/A	In	Flood prevention measures have the potential to affect strategic zones of importance for archaeology.
World Heritage Sites	Out	Out	One World Heritage Site within the study area (Royal Botanical Gardens at Kew). Whilst the site is located close to the River Thames and at risk from main river flooding, it is not considered to be at risk from local flooding and therefore not included within this assessment.
Historic farmsteads	Out	Out	More appropriately addressed at a project scale.
Archaeology	Out	Out	More appropriately addressed at a project scale.
<b>LANDSCAPE AND TOWNSCAPE</b>			
Areas of Outstanding Natural Beauty (AONB)	N/A	Out	No designated areas exist within the study area.
Land Use	N/A	In	Flood prevention measures have the potential to alter land use.
Local areas of special character (LASC)	Out	Out	More appropriately addressed at a project scale when detailed information concerning design of flood measures is available.
Strategic areas of special character (SASC)	Out	Out	More appropriately addressed at a project scale when detailed information concerning design of flood measures is available.
Designated Landscapes	N/A	In	Flood prevention measures have the potential to affect landscape character and quality. Includes Living Landscapes and National Character Areas.
Green Infrastructure	N/A	In	Green infrastructure is considered to be a key asset in terms of providing opportunity for flood prevention measures and adaptation to climate change. Includes the all London Green Grid (ALGG).



## APPENDIX C – OVERALL ENVIRONMENTAL BASELINE

### Human Health & Population

The health of people across four of the Boroughs is generally better than the England average and deprivation is lower than the average. Croydon and Wandsworth are the only exceptions, where deprivation is also lower than average, but 18,900 children and 11,800 children respectively live in poverty. Deprivation is lower than the national average across all six Boroughs.

Life expectancy is higher than the national average across four Boroughs, with the exception of Croydon and Wandsworth, where life expectancy is similar to the national average. When comparing life expectancy between the most deprived and least deprived areas across the six Boroughs, life expectancy varies between 5.8 (Kingston) and 9.5 (Croydon) years lower for men and between 4.1 (Richmond) and 6.8 (Wandsworth) years lower for women.

In 2011, the population within the study area was estimated to be 1,407,300 (2011 Census, released in July 2012)<sup>49</sup>, an increase of 129,038 (10.1%) from the 2001 Census. All boroughs experienced an increase in population, as shown in Table C.1, with the highest being Wandsworth.

The Greater London Authority (GLA) has released the 2013 round of trend-based population projections<sup>50</sup> which includes a high, central and low variant. Based on the central variant, the projected population within the study area is estimated to be 1,672,467, a predicted increase of 265,167 (18.9%) from the 2011 Census. All boroughs are predicted to have an increase in population, as shown in Table C.1, with the highest percentage increase being Sutton.

Borough	Census 2001	Census 2011	Population change (2001 – 2011)	Projected population 2036	Projected population change (2011 – 2036)
Croydon	330,587	363,400	+ 9.9%	436,218	+ 19.6%
Kingston	147,271	160,100	+ 8.7%	194,931	+ 21.5%
Merton	187,922	199,700	+ 6.3%	242,705	+ 20.1%
Richmond	172,336	187,000	+ 8.5%	216,447	+ 15.4%
Sutton	179,764	190,100	+ 5.7%	234,516	+ 22.4%
Wandsworth	260,382	307,000	+ 17.9%	347,650	12.8%

The health and levels of deprivation of people across the six boroughs are likely to continue to be better than, or improve on, the national average. The trend of increasing population is projected to continue across all six boroughs.

### Biodiversity

The London Biodiversity Partnership (LBP) identified 214 priority species that are under particular threat in London, of which eight have their own Species Action Plans (including reptiles, stag beetle and water vole).

Eleven Habitat Action Plans are currently in place in London under the London Biodiversity Action Plan (BAP). All UK BAP priority species that have an established resident population in London have been adopted as London priority species. Other London priority species have been selected because they are on the UK Red Data List, are scarce in the UK, or are characteristic of London.

<sup>49</sup> 2011 Census - Population and Household Estimates for England and Wales (March 2011)

<sup>50</sup> GLA 2013 round of trend-based population projections – Results (February 2014)

There are two European designated sites, both of which are Special Areas of Conservation (SAC) within the study area (there are no designated Special Protection Areas (SPA)). There are also seven nationally designated sites within the study area, including six Sites of Special Scientific Interest (SSSI) and one National Nature Reserve (NNR). Table C.2 lists the internationally and nationally designated sites within the study area, along with reason for designation, level of risk of local flooding from surface water (SW), groundwater (GW) and ordinary watercourse (OW), and likely dependency on water.

Site	Status	Designated for	Risk of flooding	Water dependent
Richmond Park	SAC, SSSI and NNR	<p><u>SAC designation</u></p> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>Stag beetle <i>Lucanus cervus</i></li> </ul> <p><u>SSSI designation</u></p> <p>Range of habitats of value to wildlife including acid grassland, broadleaved woodland, and of most relevance, ponds and ditches.</p>	<p>SW - Moderate</p> <p>GW - Low</p> <p>OW - Low</p>	Yes
Wimbledon Common	SAC and SSSI	<p><u>SAC designation</u></p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>European dry heaths</li> </ul> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> <li>Stag beetle <i>Lucanus cervus</i></li> </ul> <p><u>SSSI designation</u></p> <p>The most extensive area of open, wet heath on acidic soil in Greater London. Acidic soils and poor drainage give rise to a mosaic of wet heath and unimproved acidic grassland.</p>	<p>SW - Low</p> <p>GW - Low</p> <p>OW - Low</p>	Yes
Barn Elms	SSSI	A mosaic of wetland habitats supporting nationally important wintering populations of shoveler <i>Anas clypeata</i> and an assemblage of breeding birds associated with lowland waters and their margins.	<p>SW - Moderate</p> <p>GW - Low</p> <p>OW - Low</p>	Yes
Farthing Downs & Happy Valley	SSSI	The most extensive area of semi-natural downland habitats remaining in Greater London. The site is of particular interest for its species-rich chalk and neutral grasslands, and for an area of ancient woodland.	<p>SW - Moderate</p> <p>GW - Low</p> <p>OW - Low</p>	No
Riddlesdown	SSSI	Site is of particular interest as the largest single expanse of long-established calcareous scrub in Greater London and also for its herb-rich chalk grassland.	<p>SW - Low</p> <p>GW - Moderate</p> <p>OW - Low</p>	No

51 <http://www.jncc.gov.uk/ProtectedSites/>

52 <http://www.sssi.naturalengland.org.uk/special/sssi/search.cfm>



**Table C.2: Condition of Designated Areas that could be affected by the Strategies<sup>5152</sup>**

Site	Status	Designated for	Risk of flooding	Water dependent
Croham Hurst	SSSI	An area of ancient woodland with a range of stand types that reflect the variations in the underlying geology.	SW - Low GW - Low OW - Low	No

Across the study area there are 46 statutory designated Local Nature Reserves (LNR), of which 15 are located in Merton, 11 in Sutton, nine in Kingston, five in Richmond, five in Croydon and one in Wandsworth.

Whilst not a statutory designation, it is worth noting the Wandle Valley Regional Park which consists of network of green spaces notably the Wandle Trail, Mitcham Common, Beddington Park and Farmlands, and passes through Croydon, Sutton, Merton and Wandsworth.

Local Sites are sites of substantive nature conservation value or geological interest. In London, Local Sites consist of Sites of Importance for Nature Conservation (SINC), of which there are three tiers of importance; Sites of Metropolitan Importance (SMI) Sites of Borough Importance (SBI) and Sites of Local Importance (SLI). Table C.3 below lists the number of non-statutory SINC's per London Borough.

**Table C.3: Number of locally important designated sites**

Borough	Sites of Importance for Nature Conservation (SINC)			Total
	Metropolitan Importance (SMI)	Borough Importance (SBI)	Local Importance (SLI)	
Merton	4	34	19	57
Sutton	5	24	13	42
Richmond	16	18	19	53
Croydon	13	44	17	74
Wandsworth	4	19	8	32
Kingston		39		39

Table C.4 below lists the habitat types present throughout each Borough, as identified in the LBAPs or Open Space Strategies. Some of these habitats are likely to be water-dependent Protected Areas designated under other EU Directives such as the Habitats Directive.

<b>Borough Habitat</b>	<b>Merton</b>	<b>Sutton</b>	<b>Richmond</b>	<b>Croydon</b>	<b>Wandsworth</b>	<b>Kingston</b>
Woodland	Yes	Yes	Yes	Yes	Yes	Yes
Chalk grassland	No	Yes	No	Yes	No	No
Acid grassland	Yes	No	Yes	No	Yes	Yes
Heathland	Yes	No	No	Yes	Yes	Yes
Reed beds	Yes	Yes	Yes	No	Yes	No
Orchards	Yes	Yes	Yes	Yes	Yes	Yes
Tidal Thames	No	No	Yes	No	Yes	Yes
Rivers and streams	Yes	Yes	Yes	Yes	Yes	Yes
Standing water	Yes	Yes	Yes	Yes	Yes	Yes
Parks & urban green spaces	Yes	Yes	Yes	Yes	Yes	Yes
Private gardens	Yes	Yes	Yes	Yes	Yes	Yes
Wasteland	Yes	Yes	Yes	Yes	Yes	Yes

Table C.3 and Table C.4 were derived from a combination of the respective Boroughs Biodiversity Action Plans (Sutton and Richmond), Local Plans (Wandsworth and Croydon), Open Space Strategies (Wandsworth, Merton and Kingston) or identified using maps produced by MAGIC (managed by Natural England)<sup>53</sup>. In addition, Croydon had recently undergone a review of its SINC's and this has been used in combination with the Local Plan.

As habitats are limited and often isolated within the largely urban context of the study area, biodiversity is envisaged to experience continued pressure. Climate change is also likely to affect habitats, for example through changes in flood risk and/or changes in water levels. However, the London Biodiversity Action Plan<sup>54</sup> and Local Biodiversity Action Plans set out strategies for maintaining, restoring and creating habitats and as a result, biodiversity is expected to improve. In addition, assuming the habitat targets for 2020 as set out in the London BAP<sup>55</sup> are met, it is likely that the size of existing habitats and presence of habitats across the study area may increase.

<sup>53</sup> <http://magic.defra.gov.uk/home.htm>

<sup>54</sup> <http://www.lbp.org.uk/londonhabssp.html#HAPlist>

<sup>55</sup> <http://www.lbp.org.uk/habitattargets.html>

It is assumed that the number of international and national designated sites in the study area is unlikely to alter substantially in the foreseeable future.

## Water

The study area falls entirely within the Thames River Basin District, which consists of 17 management catchments. Management catchments are further broken down into individual 'river waterbody catchments' (referred to as WFD waterbodies).

The majority of the study area falls within the 'London' management catchment which is comprised of the non-tidal urban tributaries of the Thames Tideway. Parts of Richmond and Kingston also fall within the 'Maidenhead to Sunbury' management catchment, specifically the Thames (Egham to Teddington) WFD waterbody. As named under the WFD, the waterbodies found within the study area include:

- Wandle (Croydon to Wandsworth) and the River Graveney;
- Wandle (Carshalton Branch at Carshalton);
- Crane (including part of the Yeading Brook);
- Pool River;
- Beverley Brook (Motspur Park to Thames) and Pyl Brook at West Barnes;
- Hogsmill; and
- Thames (Egham to Teddington) (Maidenhead to Sunbury management catchment).

Detailed information for the WFD waterbodies found within the study area including their current WFD status, reasons for less than Good status and target objectives are provided in Table C.5.

All WFD waterbodies within the study area are designated as Heavily Modified, and therefore defined as being at significant risk of failing to achieve good ecological status due to modifications to their hydromorphological characteristics. As a result, Heavily Modified waterbodies must aim to achieve good ecological potential by 2027<sup>56</sup> rather than good ecological status. Currently;

- Pool River and Hogsmill are assessed as moderate ecological status; and
- the remaining five waterbodies are assessed as poor ecological status.

Poor water quality from both diffuse (urban runoff) and point sources (storm sewage overflows, misconnections and sewage treatment work effluent) has affected aquatic ecology, limiting the diversity of species to those most tolerant to pollution. These issues, along with invasive species and physical modification pressures, are the main reasons for failure to meet good ecological potential.

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<sup>56</sup> <http://www.environment-agency.gov.uk/research/planning/33352.aspx>

**Table C.5: Relevant Water Framework Directive surface waterbodies status and objectives'**

Waterbody ID	Waterbody Name	Hydro-morphological Designation	Current Status	Ecological Status	WFD elements less than Good	Status Objective
<b>London management catchment</b>						
GB106039023460	Wandle (Croydon to Wandsworth) and the R. Gravney	Heavily Modified	Poor	Poor	Fish, Invertebrates, Macrophytes, Phytobenthos, Phosphate	Good Potential by 2027
GB106039017640	Wandle (Carshalton Branch at Carshalton)	Heavily Modified	Poor	Poor	Fish, Hydrology	Good Potential by 2027
GB106039023030	Crane (including part of the Yeading Brook)	Heavily Modified	Poor	Poor	Fish, Invertebrates, Macrophytes, Phytobenthos, Phosphate	Good Potential by 2027
GB106039023250	Pool River	Heavily Modified	Moderate	Moderate	Fish, Invertebrates	Good Potential by 2027
GB106039022850	Beverley Brook (Motspur Park to Thames) and Pyl Brook at West Barnes	Heavily Modified	Poor	Poor	Fish, Invertebrates, Macrophytes, Phytobenthos, Ammonia, Phosphate, Specific Pollutants, Hydrology	Good Potential by 2027
GB106039017440	Hogsmill	Heavily Modified	Moderate	Moderate	Fish, Invertebrates, Ammonia, Phosphate, Specific Pollutants	Good Potential by 2027
<b>Maidenhead to Sunbury management catchment</b>						
GB106039023232	Thames (Egham to Teddington)	Heavily Modified	Poor	Poor	Phytobenthos, Phosphate	Good Potential by 2027

Water resources are extracted from the River Thames, reservoirs and groundwater sources. The underlying geology of the study area predominantly consists of Chalk, overlain by London Clay. The part of the Chalk aquifer overlain by London Clay is known as the Confined Chalk aquifer and is designated as a principal aquifer. It gains water transmitted underground within the Chalk from the North Downs and from the Chilterns. The Hogsmill, Wandle and Ravensbourne have sources that interact with the Chalk groundwater. Rainfall falling onto the North Downs is able to penetrate the soils recharging the Chalk aquifer.

As named under the WFD, the groundwater bodies found within the study area include:

- Epsom North Downs Chalk; and
- Bromley Tertiaries.

Both groundwater bodies are assessed as having good current chemical quality.

Due to the porosity of the underlying chalk, there are areas of groundwater which have a higher vulnerability to contamination and have therefore been designated as Source Protection Zones (SPZs).

SPZs 1, 2 and 3 can be found within the study area. SPZ1 is defined by the Environment Agency as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres. SPZ2 is defined by a 400 day travel time from a point below the water table. SPZ3 is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

It is assumed that the ecological status of the WFD waterbodies within the study area will improve over time in order to meet the requirement of good ecological potential. In relation to water quality, the Climate Change Risk Assessment (CCRA) highlighted that an increase in winter precipitation could lead to potential increases in Combined Sewer Outflow (CSO) spill frequency and volumes. The proposed Thames Tideway Tunnel aims to combat this problem within Greater London.

#### Material Assets

Some material assets are considered to be 'critical' or 'essential' infrastructure and deemed necessary to keep functioning during flooding. In the context of the Strategies, these assets are those where local flooding could compromise the delivery of community services provided thereby threatening the health and safety of a wider population.

Critical infrastructure includes transport networks, water supplies and sewage treatment, energy supplies, schools and hospitals. A risk of flooding to any of these would cause widespread disruption to many people, whilst having the potential to damage the economy. There is a multitude of critical infrastructure across the study area that is currently at risk, or may be at risk in the future from local flooding, as shown in Table C.6, and therefore there is a need to ensure critical infrastructure is protected.

There are thirteen main hospitals in the study area providing healthcare to the residents within the study area as well as serving those outside of the London borough administrative boundaries. They are Wilson Hospital, Nelson Hospital, St Helier Hospital, Sutton Hospital, Orchard Hill Hospital, Teddington Memorial Hospital, Croydon University Hospital, Purley War Memorial Hospital, St George's Hospital, Queen Mary's Hospital, Kingston Hospital, Surbiton Hospital and Tolworth Hospital. As well as these there are a number of smaller healthcare centres, walk in surgeries and doctor's surgeries throughout the study area. These sites are critical to the health of residents and are sites where there are many vulnerable people.

Category	Merton	Sutton	Richmond	Croydon	Wandsworth	Kingston
Hospital	2	3	1	2	2	3
Primary Schools	43	41	46	88	62	35
Secondary Schools	8	14	9	22	6	10
Colleges	2	3	3	3	3	1
Universities	0	0	1	0	0	1

Table C.6 also lists the number of primary schools, secondary schools, colleges and universities within the study area. To protect the well being of young people within the study area, sites of education require protection from the risk of flooding to keep disruption to education to a minimum.

Assets are also considered in terms of vulnerability and sensitivity to local flood risk. Table C.7 and Table C.8 summarise the different categories, distribution and quantity of infrastructure at risk of surface water flooding across the study area.

Category	Merton	Sutton	Richmond	Croydon	Wandsworth	Kingston
Essential Infrastructure	24	14	13	42	19	18
Highly Vulnerable Infrastructure	1	2	4	8	2	1
More Vulnerable Infrastructure	38	37	51	134	92	32
Households (including deprived & non-deprived)	11,731	11,395	12,450	28,377	17,502	8,941
Commercial / Industrial	407	603	1,080	2,120	1,511	589

<sup>57</sup> Number of properties at risk of surface water flooding taken from each of the Boroughs' SWMPs

**Table C.8: Description of infrastructure categories in terms of vulnerability to flood risk. Table interpreted from National Planning Practice Guidance (NPPG)<sup>58</sup> for use in identifying receptors at risk from local flooding**

Category	Description
Essential Infrastructure	Essential transport infrastructure which has to cross the area at risk Mass evacuation routes Tube stations and entrances Essential utility infrastructure which has to be located in a flood risk area for operation reasons Electricity generating power stations and grid and primary substations Water treatment works
Highly Vulnerable Infrastructure	Police stations, Ambulance stations, Fire stations, Command Centres and telecommunications installations Emergency disposal points Installations requiring hazardous substances consent
More Vulnerable Infrastructure	Hospitals Health Services Education establishments, nurseries Landfill, waste treatment and waste management facilities for hazardous waste Sewage treatment works Prisons
Households	All residential dwellings Caravans, mobile homes and park homes intended for permanent residential use Student halls of residence, residential care homes, children's homes, social services homes and hostels Deprived: Households falling into the lowest 20% of ranks by the Office of National Statistics' Indices of Multiple Deprivation Non-deprived: Households not falling into the lowest 20% of ranks by the Office of National Statistics' Indices of Multiple Deprivation

A total of 49,788 new homes are proposed to be built during the planning period within the study area<sup>59</sup>. It is likely that a proportion of these homes will either be located in areas currently at risk of local flooding, or areas where development may move or exacerbate the risk of local flooding to another area.

The study area is well served by an interconnecting transport network of roads (including red routes as classed by Transport for London as major routes through London), railways and the London underground. The critical transport infrastructure within each borough is listed below.

- Croydon: The A23 (a red route) runs from south to north through the Borough connecting it to central London and the M25, Gatwick and beyond. Along it there are major junctions including Purley Cross, Fiveways, Croydon Road, the Lombard roundabout and Thornton Heath Pond. The A232, also a red route, runs east to west connecting the Borough to neighbouring Sutton. Key rail connections between London and Gatwick, and the south coast. East Croydon station provides

<sup>58</sup> Communities and Local Government (2014) Planning Practice Guidance. Supersedes Technical Guidance to the National Planning Policy Framework. Available at <http://planningguidance.planningportal.gov.uk/blog/guidance/>

<sup>59</sup> The London Plan (2011)

direct connections to Victoria, London Bridge, St Pancras and Gatwick Airport. Croydon has connections to The City, Docklands and East London via London Overground as well as its own Croydon Tramlink.

- Kingston upon Thames: The A3 (a red route) is a strategically important highway, linking south west London with the M25 and Portsmouth. It follows the north eastern boundary of the Borough before travelling through the centre in a southerly direction through Chessington. There are nine National Rail stations and two centrally located bus stations. There are no London underground stations.
- Merton: Strategic road and rail networks traverse the Borough which includes red routes such as the A24, which runs through the Borough from Sutton and into Wandsworth, and the A217. There are five London underground stations and eleven mainline rail stations, including Wimbledon Station.
- Richmond upon Thames: The A316 and A205 trunk roads (both red routes) cross the Borough and the River Thames. The rail network is well served with overland (Waterloo and North London Lines) and underground (District Line) rail links. Heathrow airport is located to the north west of the Borough and generates large volumes of traffic which pass through the Borough.
- Sutton: The A24 and A217 (both red routes) traverse the Borough from south to north, providing key routes into central London. The A232 connects the Borough to neighbouring Croydon. The Borough is intersected by railway routes that provide over ground links from north to south and east to west.
- Wandsworth: The A3, A24, A205, A214, A306, A3205 and A3220 (all red routes) are the major trunk roads which pass through the Borough from the neighbouring Boroughs of Richmond, Kingston and Merton, and provide links to the city of London. The Borough's major railway station is Clapham Junction, which provides rail and London overground routes into and out of central London. There are also a number of smaller railway and underground stations providing links to the wider area.

Only one water treatment works within the study area is at significant risk of local flooding. Kenley water treatment works in Croydon is located within a Critical Drainage Area and is at risk of surface water and ground water flooding<sup>60</sup>. There are no sewage treatment works deemed to be at significant risk of flooding from local sources.

### Cultural, Architectural & Archaeological Heritage

The study area covers approximately 300 sq. km across the six London Boroughs (LB's). Much of this is urbanised, consisting of district centres and town centres such as Twickenham, Tooting, Putney, Clapham, Wimbledon and Morden, and metropolitan centres such as Croydon, Sutton and Kingston. The urban extent is fragmented by large open spaces, parks and gardens throughout, of which the most significant include Richmond Park, Bushy Park, Wimbledon Common, Battersea Park, Wandsworth Common, Tooting Common, Wandle Valley Regional Park and areas of Green Belt (most notably in the Boroughs of Sutton and Croydon).

Across the study area there are:

- 2,090 Listed Buildings including; the Church of St Mary Addington (Croydon), Clattern Bridge (Kingston upon Thames), Wimbledon Theatre (Merton), Hampton Court Palace (Richmond upon Thames), Beddington Place (Sutton) and Roehampton House (Wandsworth).
- 27 Registered Parks and Gardens including; Norwood Grove (Croydon), Morden Hall Park (Merton), Richmond Park (Richmond upon Thames), Oaks Park (Sutton) and Battersea Park (Wandsworth).

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60 Croydon Surface Water Management Plan



- 1 World Heritage Site at the Royal Botanic Gardens, Kew (Richmond upon Thames).
- 27 Scheduled Monuments including; Elmers End moated site (South Norwood, Croydon), Castle Hill earthwork (Kingston upon Thames), Caesar's Camp (Wimbledon Common, Merton), Old Brew House (Richmond upon Thames) and the Dovecote in Beddington Park (Sutton).
- 206 Conservation Areas including; Addington Village (Croydon), Kingston Old Town (Kingston upon Thames), Wandle Valley (Merton), Twickenham Riverside (Richmond upon Thames), Cheam Village (Sutton) and Heaver Estate (Wandsworth).
- 94 Archaeological Priority Areas including; Norwood Grove (Croydon), Mitcham Common (Merton) and Wallington (Sutton).

One protected linear view, from King Henry VIII's Mound, Richmond to St Paul's Cathedral, exists within the study area and spans across the London Boroughs of Richmond and Wandsworth in a north easterly direction, as shown in the London View Management Framework SPG (2012)<sup>61</sup>.

Table C.9 demonstrates the presence and distribution of cultural, architectural and landscape heritage across the study area.

<b>Borough</b>	<b>Merton<sup>62</sup></b>	<b>Sutton<sup>63</sup></b>	<b>Richmond<sup>64</sup></b>	<b>Croydon<sup>65</sup></b>	<b>Wandsworth<sup>66</sup></b>	<b>Kingston<sup>67</sup></b>
Listed Buildings (Grade I, II* & II)	315 <sup>68</sup>	176 <sup>69</sup>	802 <sup>70</sup>	150 <sup>71</sup>	500 <sup>72</sup>	147
Registered Parks and Gardens	4	1	15	2	5	0
World Heritage Sites	0	0	1	0	0	0
Scheduled Monuments	3	6	4	8	0	6
Conservation Areas	28	15	72	20	45	26
Archaeological Priority Areas	20	21	-	53	-	-

Some of these assets are considered to be 'at risk'; for many of the Scheduled Monuments the main risks are inappropriate management such as overgrown vegetation, erosion and decay<sup>73</sup>.

61 <http://www.london.gov.uk/priorities/planning/supplementary-planning-guidance/view-management>

62 <http://www.merton.gov.uk/>

63 <https://www.sutton.gov.uk/index.aspx?articleid=1>

64 London Borough of Richmond Upon Thames Core Strategy (2009)

65 The Croydon Local Plan: Strategic Policies (2013)

66 <http://www.wandsworth.gov.uk/site/index.php>

67 <http://www.kingston.gov.uk/>

68 [http://www.merton.gov.uk/environment/designandconservation/statutory\\_listed\\_buildings.htm](http://www.merton.gov.uk/environment/designandconservation/statutory_listed_buildings.htm)

69 London Borough of Sutton Borough Heritage Study (2009)

70 [http://www.richmond.gov.uk/listed\\_buildings](http://www.richmond.gov.uk/listed_buildings)

71 <http://www.croydon.gov.uk/environment/conservation/index>

72 Wandsworth Borough Council Buildings of Special Architectural or Historic Interest (2012)

The Strategy does not include proposals or detail of site specific measures for management of local flood risk, and as a result, it is not possible to assess the level of impact of flooding or impact from flood prevention/mitigation measures. Some historic assets may have a role in flood risk management, for example, the Richmond footbridge structure, which includes the lock and sluices, is a grade II\* listed building. These structures are often associated with flood risk management from fluvial or tidal sources (i.e. not local flooding) and therefore not included within the scope of this SEA.

There are unlikely to be substantial changes to the historic and cultural heritage environment given its importance within all six Boroughs. Built heritage conservation and cultural heritage assets are likely to remain an important economic, social and environmental feature for all six Boroughs.

### Landscape & Townscape

There are no National Parks or Areas of Outstanding Natural Beauty (AONBs) within the study area. However, the River Wandle Valley passes through the boroughs of Croydon, Sutton, Merton and Wandsworth and is lined by intermittent open green spaces and bank-side open space margins, interrupted by tracts of housing, industrial development and transport infrastructure. As identified in the London Plan and with support from local authorities, it is proposed to unify the network of open spaces along the river under the Wandle Valley Regional Park (WVRP).

The Wandle Valley is also identified as a Green Grid Area (GGA) under the London Plan. In addition, the Arcadian Thames GGA and London's Downlands GGA also cover tracts of land within the study area. The All London Green Grid has been developed to provide a strategic interlinked network of high quality green infrastructure and open spaces that connect with town centre's, public transport nodes, the countryside in the urban fringe, the Thames and major employment and residential areas.

Two living landscapes are partly located within the study area including the Crane Valley scheme and Great North Wood scheme which both aim to restore and enhance the biodiversity within each landscape.

Three Landscape Character Areas have also been designated within the study area through Landscape Character Assessments including the Inner London, Thames Basin Lowlands and the Thames Valley National Character Areas (NCAs). These are areas with a recognisable pattern of landscape characteristics, both physical and experiential, that combine to create a distinct sense of place.

Land use statistics for uses including domestic buildings, domestic gardens, non-domestic buildings, green space, paths, rail, road and water were available for each of the boroughs<sup>74</sup>. Table C.10 lists the percentage of each land use type per borough and for the study area as a whole. Within the study area, green spaces (37%) and domestic gardens (28%) account for the majority of land use. Approximately half of the total land area of LB Richmond consists of green space (50.8%) and approximately a third of the total land area of LB Sutton comprises of domestic gardens (34.5%). LB Wandsworth contains the highest proportion of domestic buildings (13.3%), non-domestic buildings (6.8%) and road/rail (20.2%) and is therefore considered the most urbanised of the boroughs.

Borough Area of	Merton	Sutton	Richmond	Croydon	Wandsworth	Kingston	Study Area
Domestic Buildings	10.0	9.3	7.0	8.8	13.3	9.0	9
Domestic Gardens	27.2	34.5	19.4	32.8	21.5	30.9	28

<sup>73</sup> [http://www.english-heritage.org.uk/publications/har-2011-registers/acc-wm-HAR-register-2011.pdf?bcsi\\_scan\\_AB11CAA0E2721250=0&bcsi\\_scan\\_filename=acc-wm-HAR-register-2011.pdf](http://www.english-heritage.org.uk/publications/har-2011-registers/acc-wm-HAR-register-2011.pdf?bcsi_scan_AB11CAA0E2721250=0&bcsi_scan_filename=acc-wm-HAR-register-2011.pdf)

<sup>74</sup> Communities and Local Government (2007) Land Use Statistics (Generalised Land Use Database). Available online at <http://data.london.gov.uk/datastore/package/land-use-ward>

<b>Borough Area of</b>	<b>Merton</b>	<b>Sutton</b>	<b>Richmond</b>	<b>Croydon</b>	<b>Wandsworth</b>	<b>Kingston</b>	<b>Study Area</b>
Non-domestic Buildings	4.8	3.5	2.7	3.2	6.8	3.6	4
Road/Rail/ Path	14.8	12.9	10.5	12.9	20.2	13.3	14
Green space	34.6	32.0	50.8	37.1	26.9	36.4	37
Water	0.7	0.5	4.6	0.1	1.7	0.7	1
Other	7.8	7.3	5.1	5.1	9.5	6.0	6

The Strategy does not include proposals or detail of site specific measures for management of local flood risk, and as a result, it is not possible to assess the level of impact of flooding or impact from flood prevention/mitigation measures. However, areas of green space and in particular trees can have a role in flood risk management and improving water quality in urban areas<sup>75</sup>.

<sup>75</sup> <https://www.woodlandtrust.org.uk/mediafile/100083915/Trees-in-our-towns.pdf>

## APPENDIX D – CONSULTATION RESPONSES

A total of seven consultation responses were received, three from the statutory consultees and five non-statutory consultees. The statutory consultation responses and the actions taken in response to each comment have been outlined below.

Comments Received	Response and Action Taken
<b>English Heritage</b>	
<p>English Heritage recommends that the sustainability themes used in Table 9.2 on page 40 of the Scoping Report are amended to include Archaeological Priority Areas (APAs) and to remove Historic Farmsteads. We consider that if a farmstead is sufficiently historic it is likely to be captured by the listed building designation category. Furthermore, we consider that APAs are a useful way of identifying archaeology strategically which enables it to be planned for more effectively. Consequently, English Heritage recommends that APAs are scoped in to the assessment.</p>	<p>Archaeological Priority Areas (APAs) have been included and scoped in for each Borough where it has been possible to access data records of APAs.</p> <p>Historic Farmsteads has remained scoped out.</p>
<p>Due to its international significance and the various pressures that it is facing, English Heritage also requests that the World Heritage Site is scoped into the assessment especially when other multiply designated heritage assets in the vicinity are currently scoped in, such as Ham House, Marble Hill and Syon Park.</p>	<p>World Heritage Sites has been scoped back in as a sustainability theme to the Richmond upon Thames SEA of the LFRMS.</p>
<p>English Heritage also recommends that the Mayor's Supplementary Planning Guidance on the Setting of World Heritage Sites and the Royal Botanic Gardens of Kew World Heritage Site Management Plan be added to the list of Plans, Programmes and Policies to be consulted.</p>	<p>Both documents have been acknowledged and added to Appendix A.</p>
<p>English Heritage would also like to see the World Heritage Site and APAs entered in the first column of Table 10.1 on page 46 under the Cultural Heritage heading.</p>	<p>Table 10.1 on page 46 of the Scoping Report has not been continued into the Environmental Report. However, APAs and World Heritage Sites have been added to Table 7.2 on page 24 of this Environmental Report.</p>
<p>English Heritage considers that the proposed SEA objective could be simplified to: Conserve and enhance heritage assets and their settings. English Heritage accepts the proposed indicators.</p>	<p>SEA objective has been simplified to 'Conserve and enhance the historic environment, heritage assets and their settings'.</p>
<b>Environment Agency</b>	
<p>The review of the main local flood risk issues set out within Section 2.2 of the SEA Scoping report cites recent flooding events, notably 2007, to highlight the significance of sources such as surface water flooding, overland flows and sewer flooding. However, the recent groundwater flooding incident experienced within the Croydon area is the most significant event to have occurred within the study area since 2000/2001, resulting in flooding of properties, severe disruption to road networks and to critical infrastructure (Kenley WTW). Given that significant impacts associated with this form of flooding we would recommend that it is reviewed within this section.</p>	<p>Acknowledgement has been made of the recent significant groundwater flooding in Croydon and added to Section 7.2 on page 21 of the Environmental Report for Croydon.</p>
<p>The geology and soils within the study area, in particular groundwater, will have a significant influence on the implementation of most elements of the strategy within particular parts of the study area (Croydon in particular), and it could be argued that this topic should be included. However, given the high level of the strategy and the absence of site specific proposals, it is acknowledged that the impact of the strategy cannot be feasibly assessed as part of the</p>	<p>In addition to comments received from Merton Borough Council, groundwater and source protection zones have been scoped in as sustainability themes, and Landscape and Townscape has been scoped in as a new topic, along with its associated SEA objective.</p>

Comments Received	Response and Action Taken
SEA process at this stage. In terms of Landscape, the same rationale applies for scoping this topic out, in terms assessing the impact of the strategy on the landscape character/quality within the study area.	
<b>Natural England</b>	
No comments which require action.	No actions required.

Comments were also acknowledged and received from the Woodland Trust, Royal Parks, and the London Boroughs of Merton, Wandsworth and Richmond upon Thames.