

## The Reading Surface Water FRA

### Introduction to the Reading Surface Water FRA

#### Description of location / reason designated as FRA

[Map of FRA and relevant place names (seems this will be provided by EA national team)]

The Reading Surface Water Flood Risk Area was identified based on a method that differs from the approach taken during the first cycle of the Flood Risk Management Plans. The latest information on flood risk to human health, the economy and environmental and cultural heritage sites has been used to assess which areas nationally are the most significantly affected from surface water flooding. The Surface Water Flood Risk Area was identified in 2011 for the first cycle of Flood Risk Management Plans. For more information, refer to Part A.

The Reading Surface Water Flood Risk Area covers the entire of Reading Borough. The Flood risk Area is primarily urban with a very low proportion of arable land.

The Reading Surface Water Flood Risk Area overlaps with a Reading Rivers and Sea Flood Risk Area associated with the River Thames and Kennet which flow through the centre of Reading. The Reading Surface Water FRA overlaps with the Reading Rivers and Sea FRA.

The surface water flood risk across the Reading Surface Water Flood Risk Area follows flow paths. These flow paths are created by topography and is influenced by urban features such as the road network within Reading.

#### Topography, Geology, Hydrogeology, Land Use

##### *Description of Topography*

The topography of the Reading Surface Water Flood Risk Area is strongly influenced by the River Thames which divides the Flood Risk Area. The River Thames flows west to east through the middle of the Flood Risk Area. The area to the north of the River Thames slopes to the south and the area to the south of the Thames slopes to the north. The River Kennet joins the River Thames from the south west forming a topographical valley through the southern part of the Reading Surface Water Flood Risk Area. Surface water flows towards the River Kennet and River Thames.

Land rises more steeply to the south of the River Thames towards the centre of Reading and West Reading. Land rises from a level of approximately 37 metres above ordnance datum (mAOD) to a level of approximately 80mAOD. Land rises more gradually to the north towards Caversham and Emmer Green to a level of approximately 92mAOD.

##### *Description of bedrock geology, superficial geology, soil type and aquifers*

The underlying geology is variable. There is chalk in the north of the Reading Surface Water Flood Risk Area and clay and sandy, gravelly clay (Lambeth Group) in the south. Within northern areas, the porosity of the chalk is low, which can result in fast infiltration rates and reduced surface water run-off. However, infiltration is heavily reduced by the urban extent across the Flood Risk Area.

### ***Description of principal land uses***

The vast majority of the Reading Surface Water Flood Risk Area is urban with a minority of green spaces made up of arable land and grassland. Immediately next to the River Thames there are some areas of arable floodplain. There are also some areas of arable and grassland floodplain associated with the River Kennet in the south of the Flood Risk Area.

### ***Description of drainage system & description of the river(s) condition(s)/ channel morphology (if applicable)***

Within the Reading Surface Water Flood Risk Area, the River Kennet and Thames run in man-made channels but are open throughout. However there are short sections for culverted highway crossings. The River Kennet is more naturalised in its upstream sections in the south west of the Flood Risk Area and is constrained through the city centre. The River Thames follows a more natural path but with man-made banks on either side as it passes through the Reading Surface Water Flood Risk Area. The River Thames is used for navigation and forms a focal point for recreation within the city.

The urban areas are served by a drainage system which is primarily the responsibility of Thames Water.

### **Identify RMAs**

The Reading Surface Water Flood Risk Area falls entirely within Reading Borough Council's Area.

There are a number of risk management authorities operating in the Reading Surface Water Flood Risk Area including:

- The Environment Agency
- Lead Local Flood Authority: Reading Borough Council
- District Council: Reading Borough Council
- Regional Flood and Coastal Committee: Thames
- Highways Authorities: Reading Borough Council
- Water and sewerage company: Thames Water
- Department of Communities and Local Government through local planning authorities: Reading Borough Council

Refer to Part A of this report to find out more about the Environment Agency's and lead local flood authorities' "National Once Measures". These aim to describe some of the generic responsibilities of these risk management authorities.

## Current flood risk

The main source of flood risk within this Surface Water Flood Risk Area is surface water. This section will discuss the surface water risk within this Flood Risk Area. For more information on fluvial risk in this area, please refer to the Rivers and Sea Flood Risk Area section of this document to gain a holistic understanding of the sources of risk.

### Surface Water Flood Risk — Overview of risk

#### *Details of areas of high risk*

Surface water flooding occurs when heavy rainfall exceeds the capacity of local drainage networks and water flows over the ground. The Reading Surface Water Flood Risk Area has been identified as being at significant risk of flooding due to the dense urban areas and associated impermeable surfacing.

### Surface Water Flood Risk — Conclusions based on / Description of Risk Statistics

For more detail, please use the online Flood Risk and Hazard maps: [\[link\]](#)

The flood hazards and risk maps estimate that 27,009 people are living within the Reading Surface Water FRA. Of those, 13,023 (48.2%) are at risk of flooding from surface water.

Also shown to be at risk of surface water flooding:

- 24 services (12.1% of the total in the area).
- 579 Non-residential properties at risk (43.7% of the total in the area).
- Critical Infrastructure: 1.22 kilometres of road (31.4% of the total in the area), and 1.12 kilometres of railway (7.0% of the total in the area). Disruption to transport routes as a result of flood risk can have an impact at both local and larger scales. The lengths of road or railway at risk only provide part of the picture of transport network flood risk as the duration of possible flooding has implications on wider impacts due to closure or restriction of routes or services.
- 109.92 hectares of agricultural land (53.9% of the total in the area).
- Protected areas: 0.69 hectares of parks and gardens (47.6% of the total in the area).
- Historical landmarks: 0.07 (5.1% of the total in the area) hectares of Scheduled Ancient Monument area and 35 (30.2% of the total in the area) listed buildings
- 2 (28.6% of the total in the area) licensed water abstraction sites

Based on this information it is concluded that we are generally managing existing flood risk effectively in parts of the Flood Risk Area. However, we keep our approach under review, looking for improvements and responding to new challenges or

information as they emerge. In other parts of the Flood Risk Area, we can generally take further action to reduce the likelihood of flooding and the impact it can have on people, the economy and the environment both for now and the future.

Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.

The flood risk and hazard maps provide more detailed information on the likelihood and consequence of flooding for the Reading Surface Water Flood Risk Area and can be found here <#>.

## How the risk is currently managed

Surface Water flood risk within the Reading Surface Water Flood Risk Area is currently managed through the drainage network which is the responsibility of Thames Water. Reading Borough Council monitor critical assets to ensure these are maintained.

### ***Details about partnership working and how it links with the River Basin Management Plan***

Reading Borough Council also works collaboratively with partners and communities to improve the water environment. Please refer to the Thames River Basin section of this report for more information on this.

The Reading Surface Water Flood Risk Area falls within the South Chilterns Catchment Partnership area, which is hosted by Thames 21.

Reading Borough Council is working collaboratively with other risk management authorities and partners through the Berkshire Strategic Flood Risk Management Partnership. The aim is to better understand the wider Berkshire area and to develop joint plans to improve the health of the local water environment. Better understanding of the catchment and the ideas and commitment of our partners means that we can be confident that together we can resolve the issues we have identified.

Reading Borough Council as the Lead Local Flood Authority, have a responsibility to manage surface water flood risk across the Reading Surface Water Flood Risk Areas. Reading Borough Council work collaboratively with Thames Water and the Environment Agency to determine how surface water flood risk can best be managed,

This section should be read in conjunction with the following local documents:

- Reading Local Flood Risk Management Strategy (2015);
- Reading Surface Water Management Plan (2013); and
- Reading Preliminary Flood Risk Assessment (2011).

This chapter should be read in conjunction with other sections of this plan (including the Reading Rivers and Sea Flood Risk Area, specifically) for information on how risk from other sources (mainly fluvial) will be managed.

## **Flood defences**

Reading Borough Council have installed several important flood defences within this Flood Risk Area for specific localities. This includes an underground storage tank in the vicinity of Vernon Crescent and Kingsley Close. Furthermore a surface water overflow system at Harness Close has been constructed to improve the capacity of the sewer network. Small scale flood alleviation schemes have also been implemented at Merrival Gardens, Lousehill Copse, in the form of an enhanced network of existing ponds, and a large open storage area in Stockton Road/the Cowsey. Property Flood Resilience measures have been installed at residential properties at Circuit Lane and Kingsley Close.

## **Hydraulic Modelling**

Climate change is potentially the most significant factor that will increase flood risk in the future. Climate change allowances, which are based on UK climate change projections that are regularly updated, are predictions of the anticipated change to peak river flow, peak rainfall intensity, sea level rise, offshore wind speed and extreme wave height. There are different allowances for different epochs or time periods over the coming century.

The best available hydraulic modelling for surface water flood risk within the Reading Surface Water Flood Risk Area is the Environment Agency Risk of Flooding from Surface Water mapping.

## **The impact of climate change and future flood risk**

[Point to the RBD section of the report, which describes general impact of climate change in the RBD.]

***Details of changes to flood extents indicated by hydraulic modelling (A generic statement may be needed if there is no up to date hydraulic modelling)***

It is possible that areas within the Surface Water Flood Risk Area could experience flooding in the future. As a result of larger flood extents and deeper depths of flood water due to the impacts of climate change, the level of protection provided by flood defences will likely decrease. There will also likely be additional maintenance needs and stresses on assets that function with a higher frequencies than were designed.

There is currently no up to date hydraulic modelling for the Flood Risk Area to show how the impact of climate change will affect future flood risk. However, it is expected that the increase in rainfall intensity would increase flood extents and depths across the Flood Risk Area putting a greater number of people, properties and infrastructure at risk.

## **Objectives and measures for the # Rivers and Sea / Surface Water Flood Risk Area**

The measures that apply specifically to the Reading Surface Water Flood Risk Area can be found in Flood Plan Explorer at [link to flood plan explorer](#).