

Milton Keynes Local Flood Risk Management Strategy

February 2016



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List of Acronyms

AEP	Annual Exceedance Probability
AWS	Anglian Water Services
BAP	Biodviersity Action Plan
BGDB	Bedford Group of Drainage Boards
BGS	British Geological Survey
CDC	Critical Drainage Catchement
CFMP	Catchment Flood Management Plan
CIL	Community Infrastructure Levy
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
FCRM	Flood and Coastal Erosion Risk Management
GiA	Grant in Aid
FIR	Flood Investigation Report
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
HRA	Habitat regulations Assessment
IDB	Internal Drainage Board
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LRF	Local Resilience Forum
MKC	Milton Keynes Council
MKPT	Milton Keynes Parks Trust
MoU	Memorandum of Understanding
NPPF	National Planning Policy Framework
PFRA	Preliminary Flood Risk Assessment
PSA	Public Service Agreement
RBMP	River Basin Management Plan
RFCC	Regional Flood and Coastal Committees
RMA	Risk Management Authority
SEA	Startegic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SPG	Supplementary Planning Guidance
SuDS	Sustainable Urban Drainage Systems
SWMP	Surface Water Management Plan
uFMfSW	Updated Flood Map for Surface Water
WFD	Water Framework Directive
WFDa	Water Framework Directive Assessment

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Executive Summary

In response to the flood events during 2007, the Government commissioned Sir Michael Pitt to undertake a review. The outcome of this, Learning Lessons from the 2007 Floods outlined the need for changes in the way England is adapting to the increased risk of flooding and the role different organisations have to deliver this function.

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010, enacted by Government in response to the recommendations of The Pitt Review, gave unitary and county councils, as Lead Local Flood Authorities, new responsibilities for leading and co-ordinating the management of local flood risk; namely the flood risk arising from surface water, groundwater and smaller watercourses and ditches, known as ordinary watercourses. This includes a statutory duty to develop, maintain, apply and monitor a strategy for the management of local flood risk.

This Local Flood Risk Management Strategy (the "Strategy") outlines the Council's priorities, as the Lead Local Flood Authority for Milton Keynes, for local flood risk management and provides a delivery plan to manage the risk over the next six years. The Strategy aims to deliver the greatest benefit to the people, property and environment of Milton Keynes.

This Strategy is for all members of the public, residents, workers, commuters, business owners and landowners within Milton Keynes. Milton Keynes Council has consulted with communities, businesses and risk management authorities to develop a coordinated Strategy for local flood risk management across Milton Keynes. The Council recognise that communities now play a much greater role in the flood risk management decision making process.

Across the Milton Keynes borough, there are risks of flooding from a number of different sources, including rivers, surface water runoff and ponding, groundwater, sewer surcharging, canals and reservoirs. It is predicted that this risk will increase in the future; influenced by climate change and increasing pressures on development and housing need.

On behalf of Milton Keynes Council, the Environment Agency has undertaken national modelling of the risk of flooding from surface water and identified 1,753 residential properties and 855 non-residential properties in Milton Keynes could be at risk of surface water flooding during a rainfall event with a 1 in 30 probability of occurrence in any given year.

Using the latest flood risk information available, and taking account of the local communities' needs and concerns, the Council have applied the guiding principles, from the Environment Agency's National Flood and Coastal Erosion Risk Management Strategy for England, when setting the following objectives for the management of local flood risk in Milton Keynes:

Milton Keynes Local Flood Risk Objectives

- 1) Ensure that drainage management is tailored to Milton Keynes unique drainage system.
- 2) Improve the Council's understanding of flood risk from all sources.
- Ensure future development does not have a negative impact on flood risk and lowers the risk where possible.
- 4) Make best use of resources for maximum protection from flooding.
- 5) Improve public awareness of flooding and help communities to become more resilient to flooding.
- 6) Improve communications between asset owners and build on existing partnership working.
- 7) Ensure emergency planning is linked to the Council's best understanding of the risks.

The Strategy is accompanied by an Action Plan setting out how to deliver the objectives of the Strategy over the next six years and a Strategic Environmental Assessment (SEA) assessing the impacts of the Strategy on the environment. A range of individual, community, council-led and Risk Management Authority (RMA) actions and improved awareness will help manage both the likelihood and impact of flooding and consequently lead to social, economic and environmental benefits to Milton Keynes' communities.

The Strategy has been consulted on, via the Milton Keynes Council consultation portal in the summer of 2015 for a period of three months. Following the consultation, the comments and recommendations were incorporated into the Strategy. The Strategy and associated documents will be published on the Milton Keynes Council website following formal adoption.

1 Introduction

1.1 Background

In England, 5.2 million properties are at risk of flooding. Of these, 1.4 million are at risk from rivers or the sea, 2.8 million are at risk from surface water and 1 million are at risk from both¹. This risk was realised in many parts of the country during the winter of 2013 to 2014, the wettest winter on record to date, with over 7,800 homes and nearly 3,000 commercial properties flooded across the UK.

However, it was the severity of the summer floods of 2007, which resulted in 55,000 properties flooding, 7,000 rescues by emergency services, 13 deaths and an estimated £3 billion of damages, which generated changes in the way flooding is managed locally and nationally.

In response to the severe flooding in2007, the Government commissioned Sir Michael Pitt to undertake a review of flood risk management. The Pitt Review – Learning Lessons from the 2007 Floods² outlined the need for changes in the way the UK is adapting to the increased risk of flooding and the role different organisations have to deliver this function.

The Flood Risk Regulations 2009 ('the Regulations')³ and the Flood and Water Management Act 2010 ('the Act')⁴, enacted by Government in response to the recommendations of The Pitt Review, gave unitary and county councils, as Lead Local Flood Authorities (LLFAs), responsibilities for leading and co-ordinating the management of local flood risk.

1.2 Flood Risk Management in Milton Keynes

Across the Milton Keynes borough, there are risks of flooding from a number of different sources, including rivers and ordinary watercourses, surface water runoff and ponding, groundwater, sewer surcharging, canals and reservoirs. In some cases more than one of these sources of flooding can combine to cause a flood event and exacerbate localised flooding.

A strategic drainage network, including flood control measures, was incorporated into the original design of the city of Milton Keynes in order to prevent the development from exacerbating the flood risk in Newport Pagnell. These measures comprise of linear parks and balancing lakes such as Oxley Park, and Westcroft which act as flood storage areas to direct flood water away from the town centre and residential areas within the urban development boundary. The city of Milton Keynes has not yet experienced a flood event that has exceeded the current design. However, climate change and continued urbanisation are likely to increase the pressure on the drainage system in the future. A number of new sustainable drainage schemes are currently in development in the city's expansion areas including Fairfields, Whitehouse and Brooklands but further action may be required to mitigate or adapt to an increased flood risk in the future.

In rural areas outside of the city of Milton Keynes, flood risk from local sources including surface water runoff and ponding, groundwater, and watercourses is less well understood. These are typically localised events which are often difficult to predict, with sparse historical records available to provide supporting evidence.

50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geh00609bqds-e-e.pdf ² Cabinet Office (2008) Sir Michael Pitt Report 'Learning lessons learned from the 2007 floods' 1

¹ Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk <u>http://a0768b4a8a31e106d8b0-</u>

http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittreview/ /media/assets/www.cabinetoffice.gov.uk/flooding r eview/pitt_review_full%20pdf.pdf

³ HSMO (2009) The Flood Risk Regulations http://www.legislation.gov.uk/uksi/2009/3042/contents/made

⁴ HMSO (2010) The Flood and Water Management Act 2010 <u>http://www.legislation.gov.uk/ukpga/2010/29/contents</u>

Local Flood Risk Definition:

"The risk of flooding from local sources including surface water, groundwater and Ordinary Watercourses (small ditches and watercourses)"

This Strategy outlines how Milton Keynes Council, a Unitary Authority, will manage flooding from local sources in their area and work with other authorities to manage all sources of flooding, now and in the future.

As the LLFA, Milton Keynes Council has a statutory requirement to produce a Strategy outlining how local flood risk will be managed and ensure that the actions identified within it are monitored and achieved. This Strategy compliments and contributes towards Milton Keynes Council's existing approach to flood risk management, as outlined in the following documents:

- Milton Keynes Drainage Strategy Development and Flood Risk Supplementary Planning Guidance (SPG)⁵;
- Upper River Great Ouse Tri LLFA Preliminary Flood Risk Assessment⁶;
- Milton Keynes Level 1 Strategic Flood Risk Assessment⁷; and,
- Milton Keynes Surface Water Management Plan (SWMP)⁸.

Whilst this strategy will focus on managing local sources of flood risk, it must be acknowledged also that main rivers and balancing lakes in Milton Keynes are integral to the whole system of water management. Effective ongoing relationships with other responsible authorities (see Section 2) including through engagement in this strategy is essential in the overall management of flood risk.

1.3 The Milton Keynes Local Flood Risk Management Strategy

The purpose of this Strategy is to set out Milton Keynes Council's approach to managing flood risk from local sources (i.e. surface water, ordinary watercourses and groundwater) in both the short and longer term, with proposals for sustainable actions that will help to manage the risk in a way that delivers the greatest benefit to the residents of Milton Keynes, businesses and the environment. It also outlines how Milton Keynes Council will work with others to manage all sources of flooding within the borough and neighbouring catchments.

⁵ Milton Keynes Council (2004) Milton Keynes Drainage Strategy – Development and Flood Risk Supplementary Planning Guidance

⁶ Bedford Group of Drainage Boards (2011), Upper River Great Ouse Tri LLFA Preliminary Flood Risk Assessment for Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council <u>http://m.centralbedfordshire.gov.uk/environment/natural-environment/flood-risk/default.asp</u>

⁷ URS (2015), Milton Keynes Level 1 Strategic Flood Risk Assessment.

⁸ Milton Keynes Council (2015) Milton Keynes Surface Water Management Plan

Figure 1.1: Structure of the Strategy

Milton Keynes Strategy Document Structure			
Roles and responsibilities for flood risk management	Section 2		
Assessment of flood risk	Section 3Appendix A (Maps)		
Objectives for managing local flood risk	Section 4		
Measures proposed to deliver the objectives	Section 5 to Section 12Action Plan (Appendix C)		
How the Strategy contributes to the achievement of Environmental Objectives	 Section 13 Strategic Environmental Assessment Habitats Regulations Assessment Screening 		
How and when the Strategy will be monitored and reviewed	Section 14		
Summary of the Strategy	Summary of the Strategy		

This Strategy complements and supports the National Strategy⁹, published by the Environment Agency, which outlines a National framework for flood and coastal risk management, balancing the needs of communities, the economy and the environment.

This Strategy has been developed in partnership with Risk Management Authorities (RMAs) including the Environment Agency, Bedford Group of Drainage Boards (BGDB), Milton Keynes Parks Trust and Anglian Water Services (AWS), as well as local communities. Further details of RMAs and other organisations with responsibilities for local flood risk management are provided in Section 2.

Delivering flood risk management also provides the opportunity to deliver wider environmental objectives and requirements, as set out in European legislation including the Water Framework Directive¹⁰. The approach for this, including the preparation of a Strategic Environmental Assessment (SEA) Scoping Report, is outlined in Section 13.3.

Legislative Context 1.4

This section provides a summary of the relevant pieces of national legislation and local policies that outline Milton Keynes Council's requirements for flood risk and environmental management across the borough.

⁹ Defra, Environment Agency (2011) The National Flood and Coastal Erosion Risk Management Strategy for England http://www.environmentagency.gov.uk/research/policy/130073.aspx ¹⁰ European Union (2000) Water Framework Directive <u>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT</u>

1.4.1 Flood and Water Management Act 2010

The Act aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It does this by defining 'Risk Management Authorities' (RMA) and formalises the flood risk management roles and responsibilities for each.

Further details regarding responsibilities and functions in relation to their flood risk management responsibilities in Milton Keynes borough is provided in Section 2.

1.4.2 Flood Risk Regulations 2009

Milton Keynes Council has legal obligations under the EU Floods Directive¹¹, which was transposed into UK Law through the Flood Risk Regulations 2009¹² ('the Regulations').

Preliminary Flood Risk Assessment

Under the Regulations, all LLFAs were required to prepare a Preliminary Flood Risk Assessment (PFRA) report. The Bedford Group of Internal Drainage Boards prepared a joint PFRA¹³ on behalf of Central Bedfordshire Council, Bedford Borough Council and Milton Keynes Council. The PFRA seeks to provide a high level overview of flood risk from local flood sources and includes flooding from surface water (i.e. rainfall resulting in overland runoff), groundwater, ordinary watercourses (smaller watercourses and ditches) and canals. It excludes flood risk from main rivers, the sea and reservoirs, as these are assessed nationally by the Environment Agency.

Anglian River Basin District draft Flood Risk Management Plan (FRMP)

Under the Regulations, LLFAs must prepare FRMPs in formally identified Flood Risk Areas where the risk of flooding from local sources is significant (i.e. surface water, groundwater, ordinary watercourses), and the Environment Agency is required to prepare FRMPs for all of England covering flooding from main rivers, the sea and reservoirs.

There are no formally defined Flood Risk Areas within Milton Keynes borough, therefore Milton Keynes Council are not required to prepare a FRMP. As such, the Anglian River Basin District FRMP¹⁴ has been published for consultation by the Environment Agency and sets out the proposed measures to manage flood risk in the Anglian River Basin District from 2015 to 2021 and beyond.

1.4.3 National Planning Policy Framework

As the Local Planning Authority, the National Planning Policy Framework¹⁵ (NPPF) and supporting guidance¹⁶ requires Milton Keynes Council to undertake a Strategic Flood Risk Assessment (SFRA) and to use the findings, and those of other studies, to inform strategic land use planning including the application of the Sequential Test which seeks to steer development towards areas of lowest flood risk prior to consideration of areas of greater risk. The Milton Keynes Council Level 1 SFRA¹⁷ was originally produced in 2008 and updated in 2015.

1.4.4 Land Drainage Act 1991

The Land Drainage Act¹⁸ sets out the statutory roles and responsibilities of key organisations such as Internal Drainage Boards, local authorities, the Environment Agency and Riparian owners with jurisdiction over watercourses and land drainage infrastructure. Parts of the Act have been amended by the Flood and Water Management Act 2010.

1.4.5 Climate Change Act 2008

Under the Climate Change Act, the Government, public bodies and statutory organisations are required to report on how they are adapting to climate change.

Milton Keynes Council will report in this Strategy the impact of climate change and its effect on flood risk throughout the borough, including any plans to manage and mitigate the effects.

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¹¹ European Union (2007) EU Floods Directive 2007/60/EC <u>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007L0060:EN:NOT</u>

 ¹² HSMO (2009) The Flood Risk Regulations <u>http://www.legislation.gov.uk/uksi/2009/3042/contents/made</u>
 ¹³ Bedford Group of Drainage Boards, July 2011, Upper River Great Ouse Tri LLFA Preliminary Flood Risk Assessment for Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council <u>http://m.centralbedfordshire.gov.uk/environment/natural-environment/flood-risk/default.asp</u>
 ¹⁴ Environment Agency (October 2014) Anglian River Basin District Consultation on the draft Flood Risk Management Plan <u>https://consult.environment-</u>

agency.gov.uk/portal/ho/flood/draft_frmp/consult?pointId=3063510 ¹⁵ Communities and Local Government (2012) National Planning Policy Framework <u>http://www.communities.gov.uk/documents/planningandbuilding</u>

[/]pdf/2116950 ¹⁶ Communities and Local Government (2014) Planning Practice Guidance: Flood Risk and Coastal Change:

http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/

URS (2015), Milton Keynes Council Level 1 Strategic Flood Risk Assessment.

¹⁸ HSMO (1991) Land Drainage Act <u>http://www.legislation.gov.uk/ukpga/1991/59/contents</u>

1.4.6 Strategic Environmental Assessment (SEA) Directive 2001

The SEA Directive¹⁹ was adopted by the European Union and transposed into English law as the Environmental Assessment of Plans and Programmes Regulations²⁰ (Statutory Instrument No.1633) in 2004.

The Directive requires a SEA to be carried out for all plans and programmes which are 'subject to preparation and/or adoption by an authority at national, regional or local level'. The SEA informs the preferred long-term strategy through its identification of the likely significant effects of the implementation of the Strategy on relevant environmental receptors.

1.4.7 Water Framework Directive (WFD) 2000

The Water Framework Directive (WFD)²¹ is a European Directive which introduced a strategic planning process to manage, protect and improve the water environment. Local strategies should be assessed for WFD compliance to ensure that local measures reduce flood risk, comply with the objectives of the WFD, and identify, where possible, measures to contribute to achieving WFD objectives.

The Environment Agency is responsible for preparing management plans for river basin districts in England and Wales. These plans must be prepared in line with the requirements of the WFD. The plans outline the characteristics of the river basin district, identify the pressures that the local water environment faces and actions to improve or manage these. Milton Keynes is covered by the Anglian River Basin Management Plan (RBMP)²².

1.4.8 Highways Act 1980

Under Section 100 of the Highways Act²³, Milton Keynes Council as the Highway Authority has powers to construct, maintain or cleanse drainage systems in the highway or on adjoining/nearby land, for the purpose of drainage or prevention of surface water on the highway.

1.4.9 Other relevant legislation

In addition, other legislation such as the Water Industry Act 1991²⁴, Water Resources Act 1991²⁵ Civil Contingencies Act 2004²⁶ and Environment Agency byelaws place duties and powers upon specific organisations and individuals of relevance to local flood risk management. The Buckingham and River Ouzel Internal Drainage Board (IDB) Byelaws (2002) relating to flood risk management are detailed in the Milton Keynes Level 1 SFRA.

1.5 Supporting Plans and Documents

Over recent years, a number of documents have been prepared detailing the assessment and management of flood risk within Milton Keynes borough. Figure 1-2 illustrates the sequence of flood risk studies, plans, legislation and data in relation to the Strategy. Each of these have built on emerging evidence, assessments and modelling techniques to improve the knowledge of flood risk across the borough.

^{20 H}SMO (2004) Environmental Assessment of Plans and Programmes Regulations. <u>http://www.legislation.gov.uk/uksi/2004/1633/contents/made</u>

²¹ European Union (2000) Water Framework Directive 2000/60/EC. <u>http://eur-lex.europa.eu/LexUriServ/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT</u>
 ²² Anglian River Basin Management Plan (2014) <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/309814/River_Basin_Management_Plan.pdf</u>

¹⁹ European Union (2001) Strategic Environmental Assessment Directive 2001/42/EC. http://ec.europa.eu/environment/eia/sea-legalcontext.htm

²³ HSMO (1980) Highways Act http://www.legislation.gov.uk/ukpga/1980/66/contents

²⁴ HSMO (1991) Water Industry Act http://www.legislation.gov.uk/ukpga/1991/56/contents

²⁵ HMSO (1991) Water Resources Act http://www.legislation.gov.uk/ukpga/1991/57/contents

²⁶ HSMO (2004) Civil Contingencies Act <u>http://www.legislation.gov.uk/ukpga/2004/36/contents</u>



Figure 1-2 Timeline of supporting documents, datasets and legislation for the Strategy

It is intended that this Strategy will form a key document in this suite of flood risk management plans, drawing together existing flood risk studies and plans into a single document that outlines how Milton Keynes Council will manage local flood risk going forwards. This is illustrated in Figure 1-3.

This Strategy draws on technical information and historic records of flooding presented in the Milton Keynes Drainage Strategy SPG²⁷, the Upper River Great Ouse Tri LLFA Preliminary Flood Risk Assessment²⁸, the Milton Keynes Level 1 SFRA²⁹ and the Milton Keynes Surface Water Management Plan (SWMP)³⁰. These documents and the partnerships forged between Risk Management Authorities during their preparation are built upon and formalised as part of the Strategy.

This Strategy draws from, and supports, a number of wider environmental plans and documents which cover the Anglian River Basin. These regional plans include the Anglian RBMP³¹, The Great Ouse Catchment Flood Management Plan (CFMP)³² and Anglian FRMP Scoping Report³³.

The Anglian RBMP is concerned with the pressures faced by the water environment in the Anglian River Basin District and the actions that will address them. Whilst considerable progress has been made in protecting river basin assets in recent years there are a number of challenges which remain including point source and diffuse pollution, physical modification of water bodies and water abstraction.

The Great Ouse CFMP provides an overview of the flood risk posed across the river catchment and the recommended ways of managing such risk both now and in the future. The Great Ouse CFMP considers all sources of inland flooding

²⁸ Bedford Group of Drainage Boards (2011), Upper River Great Ouse Tri LLFA Preliminary Flood Risk Assessment for Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council http://m.centralbedfordshire.gov.uk/environment/natural-environment/flood-risk/default.asp 28 A FCOUL (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2014) (2

²⁹ AECOM (2014), Milton Keynes Level 1 Strategic Flood Risk Assessment.
 ³⁰ Milton Keynes Council (2015) Milton Keynes Surface Water Management Plan

²⁷ Milton Keynes Council (2004) Milton Keynes Drainage Strategy – Development and Flood Risk Supplementary Planning Guidance

³¹ Anglian River Basin Management Plan (2014) <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/309814/River_Basin_Management_Plan.pdf</u>

 ³² Great Ouse Catchment Flood Management Plan (2009) https://www.gov.uk/government/publications/great-ouse-catchment-flood-management-plan
 ³³ Anglian River Basin District: Flood Risk Management Plan (FRMP) Scoping Report (2014) https://www.gov.uk/government/publications/anglian-river-basin-district-flood-risk-management-plan-frmp-scoping-report

and accounts for the likely impacts of climate change, land use management and sustainable development. The Great Ouse CFMP will be complemented by the forthcoming Anglian River Basin District FRMP, due to be published in 2016. The Anglian FRMP Scoping Report was produced in July 2014 and outlines the flood risk planning which is currently underway across the river basin and provides information relating to the consultation process and which stakeholders would lead on these consultations. Ultimately the overarching aims of the FRMP will be to manage flood risk across the river basin in a way which protects and improves the environment whilst minimising the effect of flooding upon people's lives and will outline significant flood risk, receptors and consequences of flooding across the Milton Keynes borough.



Figure 1-3: Legislative Drivers and Supporting Documents for the Strategy

1.6 Community Engagement and Consultation

A community engagement exercise was undertaken between November 2014 and March 2015 offering parish councils and ward members the opportunity to shape the development of the Strategy and future flood risk management priorities. Details of the outcomes from the community engagement activities are included in Appendix B.

The Survey showed that more than half of respondents felt that the main causes of flooding in their local area are:

- 1. Blocked or overflowing road drains;
- 2. Runoff from fields and adjacent land; and
- 3. Smaller ditches and streams.

Beyond keeping people safe and protecting life, approximately two thirds of the respondents to the Survey considered changes to flood management policy for new development and increased maintenance of watercourses and road drains as the priorities for flood risk management in Milton Keynes.

Over half of the respondents emphasised the need for more information on the following aspects, including:

- Who is responsible for dealing with the different flood types;
- Information on the maintenance on local watercourses; and,
- What areas in Milton Keynes are at risk of flooding.

These findings were used to inform the development of the local objectives for local flood risk management, for example to raise awareness of flooding and also how communities, residents and business can better protect themselves. This report forms the draft Strategy which will undergo a period of public consultation, offering the opportunity for residents, businesses and risk management stakeholders to provide feedback. Following public consultation, the Strategy will be updated and finalised in line with comments received before it is adopted and published.

2 Roles and Responsibilities for flood risk management

2.1 Who are the 'Risk Management Authorities' in Milton Keynes?

Flood events are often a complex interaction of flood source(s), pathway(s) and receptor(s), the responsibility for managing which can lie with a number of different organisations or individuals. As a result, a clear definition of responsibilities and effective communication across these organisations and individuals is vital if the risk to people, property and the environment across the Milton Keynes borough is to be managed effectively.

The following organisations are designated Risk Management Authorities (RMAs) under the Regulations and the Act, and have a number of legal responsibilities for managing flood risk in Milton Keynes:

- Milton Keynes Council as the Lead Local Flood Authority (LLFA);
- Environment Agency;
- Anglian Water as the water and sewerage undertaker;
- Milton Keynes Council and Highways Agency as the Highway Authorities;
- Parks Trust as a riparian owner; and
- Bedford Group of Drainage Boards (BGDB).

All RMAs have a duty to cooperate with the LLFA and other RMAs when exercising their flood risk management functions.

In addition, other legislation (such as the Highways Ac t 1980, Land Drainage Act 1991³⁴, Water Resources Act 1991³⁵, Water Industry Act 1991²⁴ and Civil Contingencies Act 2004) place duties and powers upon specific organisations and individuals of relevance to local flood risk management.

2.2 Milton Keynes Council – Roles and Responsibilities

Milton Keynes Council has a number of roles and responsibilities for flood risk management under the Act, the Regulations and other national legislation, as outlined below.



- Statutory consultee to the planning for planning applications with surface water drainage and local flood risk

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³⁴ HSMO (1991) Land Drainage Act <u>http://www.legislation.gov.uk/ukpga/1991/59/contents</u>

³⁵ HMSO (1991) Water Resources Act <u>http://www.legislation.gov.uk/ukpga/1991/57/contents</u>

2.2.1 Role as LLFA

As the LLFA, Milton Keynes Council has a number of duties and discretionary powers under the Act, the Regulations and Land Drainage Act 1991. Figure 2-1 presents the LLFA duties and discretionary powers.

SuDS Statutory Consultee

Sustainable Drainage Systems (SuDS) are an approach to managing rainwater and surface water that replicates natural drainage, the key objectives being to manage flow rate and volume of runoff to reduce risk of flooding and water pollution. The recent government SuDS policy update has assigned LLFAs as statutory consultees to the planning process for surface water drainage in relation to planning applications for major development. From 6th April 2015, SuDS proposals will be required for all planning applications for major developments. As the LLFA, Milton Keynes Council will need to be consulted on the drainage elements of planning applications to ensure they conform to necessary national and local SuDS standards.

2.2.2 Role as Highway Authority

The highway drainage system is integral in the management and behaviour of surface water during heavy rainfall events. As a Highway Authority, Milton Keynes Council is required by the Highways Act 1980³⁶ to ensure that all local highways are drained of surface water and where necessary maintain highway drainage systems. Surface water drainage is also an integral part of any highways scheme and therefore, for any scheme for which MKC Highways are responsible, there is an obligation to take surface water drainage into account as part of any design.

2.2.3 Role as Emergency responder

Milton Keynes Council is a Category 1 Responder under the Civil Contingencies Act 2004³⁷ and therefore has a responsibility, along with other organisations for developing emergency plans, contingency plans and business continuity plans to help reduce, control or ease the effects of an emergency in Milton Keynes.

2.2.4 Role as Local Planning Authority

As a Local Planning Authority (LPA) Milton Keynes Council has a responsibility to consider flood risk in their strategic land use planning and the development of their Local Plan, as set out under the National Planning Policy Framework³⁸ (NPPF) and supporting guidance³⁹. Milton Keynes Council is the 'decision maker' on flood risk for planning applications for development, taking into consideration technical advice from other risk management authorities as consultees (statutory).

When considering applications for development, the Council requires site-specific flood risk assessments to be undertaken in line with the NPPF. Local requirements for these are outlined in the Milton Keynes Council Level 1 SFRA⁴⁰. Milton Keynes Council has developed exemplar partnership working with advice and guidance from flood risk partners such as the Environment Agency and BGDB on development and flood risk, which has proved invaluable with the levels of growth in Milton Keynes.

From 6th April 2015, all major development applications must demonstrate prioritising of SuDS and it is Milton Keynes Council's duty to enforce this policy through the planning application process. Milton Keynes Council proposes to further develop its past successes of aligning development and managing flood risk working with other RMA's.

2.2.5 As the Regulator of Ordinary Watercourses

Under the Land Drainage Act 1991, one of the Council's roles is the regulation of ordinary watercourse consent. Any works (either temporary or permanent), that may alter or impact the flow or storage of water within an ordinary watercourse outside of IDB areas will require consent from the Council prior to any work being carried out. Milton Keynes Council therefore has:

- The power to serve notice on riparian landowners along ordinary watercourses who need to carry out maintenance to reduce flooding or who are not fulfilling their riparian responsibilities;
- Where an obstruction in an ordinary watercourse has been erected, raised or altered (such as a weir or culvert) without
 prior consent from Milton Keynes Council, and is deemed to be causing a 'nuisance', the Council has the power to
 serve notice on a person to remove or reduce the obstruction;

³⁶ HSMO (1980) Highways Act http://www.legislation.gov.uk/ukpga/1980/66/contents

³⁷ HSMO (2004) Civil Contingencies Act <u>http://www.legislation.gov.uk/ukpga/2004/36</u>/contents

³⁸ Communities and Local Government (2012) National Planning Policy Framework <u>http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950</u>

³⁹ Communities and Local Government (2012) Technical Guidance to the National Planning Policy Framework

http://www.communities.gov.uk/publications/planningandbuilding/nppftechnicalguidance

⁴⁰ AECOM (2014), Milton Keynes Level 1 Strategic Flood Risk Assessment.

- Permissive Powers to maintain, improve and build new flood defences and watercourses; and.
- Powers of Entry for carrying out works.

Ordinary watercourses within Milton Keynes are shown in Figure 2-2 and Figure A1 in Appendix A. More detailed information regarding ownership and maintenance responsibility of different watercourses is being developed in a separate Asset Register due to be completed in 2016.

2.2.6 Role as a land owner and asset owner

Milton Keynes Council is responsible for the maintenance of Council owned assets which have a role in flood risk management. These include community open spaces, drainage ditches, gullies, trash screens and culverts across the Milton Keynes borough.



Figure 2-1: Milton Keynes Council Duties and Discretionary Powers under the Act



Figure 2-2 - Main rivers and ordinary watercourses in Milton Keynes and IDB boundaries

2.3 The Environment Agency

The Environment Agency is designated a RMA under the Act and is a statutory consultee on flood risk from main rivers and the sea. The Environment Agency are responsible for managing flooding from main rivers (such as the River Great Ouse and the River Ouzel) and have a responsibility to provide a strategic overview for all flooding sources. Figure 2-2 and Figure A1 in Appendix A shows all main rivers in Milton Keynes.

The Environment Agency take a risk based approach to flood risk management and have a number of roles and responsibilities, including as a statutory consultee on flood risk throughout the planning process and regulation of third party works on main rivers.

The Environment Agency also established the Regional Flood and Coastal Committee (RFCC), which is a committee bringing together members appointed by LLFAs and independent members to ensure there are coherent plans for identifying and communicating flood risk and approve the annual programme of flood defence work in their region and set the <u>local levy</u>.

2.4 Anglian Water Services (AWS)

As the sewerage undertaker serving Milton Keynes borough⁴¹, AWS is designated a RMA under the Act. AWS is responsible for surface water drainage from development via adopted sewers and for maintaining public sewers into which a significant amount of the highway drainage connects in urban areas.

In October 2011, water and sewerage companies in England and Wales became responsible for private foul and surface water sewers connected to public surface water sewers (not private surface water sewers which discharge directly to a watercourse) which were previously the responsibility of property owners. However, not all private sewers were included; there are some cases where the property owners remain responsible for the sections of pipe between the property and the transferred private sewer. Further information is available via the AWS website⁴².

Environment Agency is responsible for:



- Managing flood risk from main rivers (e.g. River Great Ouse and River Ouzel), reservoirs, estuaries and the sea.
- Providing a strategic overview for all sources of flooding and coastal erosion.
- Regulation of third party works on main rivers.
- Regulation of works in, over, under and within 9m of the top bank of main rivers.
- Allocating national Flood and Coastal Risk Management Grant in Aid (FCRM GiA) to RMAs for capital schemes.
- Permissive powers to undertake maintenance and capital improvements works on main rivers.

Anglian Water Services is responsible for:

love every drop

- The drainage of surface water from development via sewers adopted by Anglian Water.
- Maintaining public sewers owned by Anglian Water Services into which much of the highway drainage connects.
- Maintaining a number of the balancing lakes within Milton Keynes.
- Maintaining and improving its water mains and other pipes to reduce the risk of leaking or burst pipes.
- Reporting its performance each year to Ofwat (The Water Services Regulation Authority), including in respect of internal sewer flooding of properties.

⁴¹ The Independent Water Networks Ltd serves as the sewerage undertaker for the Brooklands development to the east of Milton Keynes, and therefore have the same responsibilities as AWS.

⁴² Anglian Water Services website https://www.anglianwater.co.uk/household/water-recycling-services/private-sewers-and-lateral-drains.aspx

2.5 Bedford Group of Drainage Boards (BGDB)

The Bedford Group of Drainage Boards (BGDB) is a consortium comprising the Buckingham and River Ouzel Internal Drainage Board (IDB) which operates within the Milton Keynes borough, as well as the Bedfordshire and River Ivel IDB and the Alconbury and Ellington IDB. Figure 2-2 and Figure A1 in Appendix A highlights the region of Milton Keynes where the BGDB operates.

The BGDB is responsible for managing water levels in the watercourses designated to each IDB and work in partnership with other authorities to actively manage and reduce the risk of flooding within the board's district. They have permissive powers under the Land Drainage Act 1991 (as amended by the 1994 Act) to undertake maintenance on any watercourse within their district other than "Main River" and to supervise all matters relating to the drainage of land within their districts. Permissive powers means that the BGDB is permitted to undertake works on ordinary watercourses but the responsibility

Bedford Group of Drainage Boards is responsible for:



- Manage and reduce the risk of flooding within the IDB's district.
- Permissive powers to undertake maintenance on ordinary watercourses within their district;
- Byelaws securing the efficient working of the drainage systems;
 - Consenting in the Drainage District; and
- Advise planners on SuDS.

remains with the riparian owner⁴³ as the IDBs are not obligated. IDBs can undertake works on watercourses outside their drainage district in order to benefit the district. IDBs may make byelaws, approved by the relevant Minister, for securing the efficient working of the drainage systems. The Buckingham and River Ouzel IDB Byelaws (2002) relating to flood risk management are detailed in the Milton Keynes Level 1 SFRA (2014)⁴⁴.

2.6 The Milton Keynes Parks Trust

Milton Keynes Parks Trust (MKPT) is a charitable trust that owns and maintains most of the parkland in Milton Keynes, including the linear parks that run along the city's river valleys and provide valuable areas of floodplain. The Trust has the rights and responsibilities of riparian owners for the watercourses that run through its parks (see Section 2.8.2). Many of the linear parks contain the large balancing lakes such as Caldecotte, Willen and Furzton. The Trust is responsible for maintaining the land around these lakes and their recreational use but it is not responsible for the flood management function of these lakes. This responsibility, and the operation and maintenance of the control structures and weirs, lies with Anglian Water. The MKPT is responsible for maintaining various local Sustainable Drainage Systems (SuDS) within some residential and industrial estates. These SuDS include networks of ponds

Milton Keynes Parks Trust is responsible for:

The**Parks**Trust

- Riparian ownership of the watercourses through the linear parks in Milton Keynes.
- Maintaining the linear parkland in the river valleys to allow them to effectively function as floodplains
- Managing the land around the large balancing lakes within the linear parks and recreational use of the lakes.
- Managing a number of Sustainable Drainage Systems (SuDS) in some residential and commercial estates.

and ditches set within attractive landscaped green areas within the developments.

2.7 Highways Agency

The Highways Agency is responsible for managing highway drainage from the motorways and major trunk road network in England, including the slip roads to and from trunk roads. Within Milton Keynes this includes the M1, A5, A421, and A509. Figure A2 in Appendix A shows the critical infrastructure within Milton Keynes.

Highways Agency is responsible for:



 Managing highway drainage from the motorways and major trunk road network, including the slip roads

IDB

⁴³ The responsibility for managing and maintaining ordinary watercourses falls to riparian owners who typically own land on either bank and therefore are deemed to own the land to the centre of the watercourse. Milton Keynes Council, as the LLFA, has responsibility to manage the risk of flooding arising from the watercourses through engagement with riparian owners and enforcing maintenance responsibilities in accordance with the <u>Land Drainage Act 1991</u>, <u>http://www.legislation.gov.uk/ukpga/1991/59/contents</u>.

http://www.legislation.gov.uk/ukpga/1991/59/contents. 44 URS (2015), Milton Keynes Council Level 1 Strategic Flood Risk Assessment.

2.8 Responsibilities of Other Organisations / Individuals

Milton Keynes Council recognises the vital role individuals, communities and businesses have in managing flood risk and the requirement for more information to be available to support these initiatives. This Strategy aims to promote and encourage personal responsibility by raising awareness of flood risk and how this can be reduced and by supporting community-based actions.

2.8.1 Property Owners and Residents

It is the responsibility of householders and businesses to look after their property, including protecting it from flooding. It is important that householders, whose homes are at risk of flooding, take steps to ensure that their home is protected.

Practical guidance can be found in the publication 'Prepare your property for flooding' available on the Environment Agency website⁴⁵.

2.8.2 Riparian Owners

Riparian owners have the responsibility to manage their own flood risk. If you own land which is adjacent to a watercourse or land which has a watercourse running through it, you are a riparian owner and you have certain legal responsibilities to maintain the watercourse unobstructed. Where a watercourse marks the boundary between adjoining properties, it is normally presumed the

Home and Business owners are responsible for:

- Protecting their property (through property level resilience and resistance measures).
- Maintaining a proper flow of water in any watercourse running through their land.

Individuals can:

- Reduce flood risk by taking action such as disposing of leaf litter rather than letting it block drains
- Co-operating with neighbours and other RMAs,
- Getting involved in local flood risk management activities.

riparian owner owns the land up to the centre line of the watercourse. Figure 2-3⁴⁶ details the different roles and responsibilities in relation to ditches.



Figure 2-3 – Ditch Ownership and Maintenance Responsibilities⁴⁶

⁴⁵ Environment Agency website - 'Prepare your property for flooding' <u>https://www.gov.uk/prepare-for-a-flood</u>

⁴⁶ Northamptonshire County Council, Flood Tool Kit, <u>https://www.floodtoolkit.com/wp-content/uploads/2015/02/Ditch-Clearance-Guidelines_March2013.pdf</u>

In general, riparian owners also have the responsibility of piped watercourses and culverts, from where they enter to the point they leave that person's land. The duties, responsibilities and rights exist for piped watercourses and culverts as for open channels, so owners must clear any blocked culverts or pipes on their land or under their property.

Farmers are required to use techniques that prevent rainwater from washing topsoil into watercourses. Allowing runoff may constitute a criminal offence and farmers could risk losing their Single Farm Payment.

Further information for riparian owners on their responsibilities is available in the Environment Agency publication 'Living on the Edge'⁴⁷ and on the Environment Agency website⁴⁸.

Riparian owners are responsible for:

- Maintaining the banks and bed of the watercourses, including trees and shrubs growing on the banks, and any flood defences that exist on it.
- Clearing litter from the watercourses and banks, even if it did not come from their land.
- Maintaining and clearing any structures on their stretch of watercourses including culverts, weirs and mill gates from obstructions (natural or otherwise) so the normal flow of water is not impeded.
- Accepting the natural flow from the upstream neighbour and transferring it downstream without obstruction, pollution or diversion.
- Applying to Milton Keynes Council for formal consent to carry out any works within any ordinary watercourses, or to notify Milton Keynes Council of any works adjacent to any ordinary watercourses outside BGDB Drainage District.
- Applying to the Environment Agency for formal consent to carry out any works in, over, under or within 9 metres of a main river.
- Applying to Buckingham and River Ouzel Internal Drainage Board for formal consent to carry out any works within 9 metres of any watercourse in the Drainage District
- IF AN OWNER FAILS TO FULFIL THESE RESPONSIBILITIES THEY MAY FACE LEGAL ACTION

2.8.3 Insurance Companies

Insurers do not have any statutory duties or responsibilities under the Act. However, the Flood Reinsurance Scheme under the Water Act 2014⁴⁹, known as 'Flood Re', is a not-for-profit scheme proposed by the Association of British Insurers to safeguard the availability and affordability of flood insurance for properties at high risk. The scheme will cap the flood aspect of buildings insurance according to council tax band, and will be funded by an annual levy on all household premiums. Properties in Tax band H and properties built since 2009 are not covered by the scheme.

2.8.4 Other Local stakeholders

There are a number of other local stakeholders with an interest in flood risk management in Milton Keynes. These are:

- Buckinghamshire County Council and Northamptonshire County Council as neighbouring LLFAs;
- Town and Parish Councils, of which there are 48 in Milton Keynes representing the interests of local people within each community;
- Network Rail;
- Canal and River Trust;
- Neighbouring Councils, including Bedford Borough Council, Central Bedfordshire Council, Aylesbury Vale District Council and South Northamptonshire Council.

⁴⁷ Environment Agency (2012) 'Living on the Edge' <u>https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities</u>

⁴⁸ https://www.gov.uk/river-maintenance-and-drainage-charges-farmers-and-landowners

⁴⁹ HMSO (2014) The Water Act 2014 http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted

3 Overview of Flood Risk in Milton Keynes

3.1 What do mean by Flood Risk?

Flood risk is not just the likelihood of flooding occurring, but also the potential damage a flood could cause. Assessing risk in quantifiable, financial terms can help prioritise where available funding should be directed, as well as support applications for additional external funding.

However, it should also be borne in mind that the consequences of flooding can be far reaching and not always easy to value, particularly the social impacts of displacement from property, loss of possessions and fear of repeat events.



3.2 Local sources of flood risk

Flood Risk across the Milton Keynes borough is associated with a number of sources including surface water runoff; sewer and highway networks; groundwater; fluvial (main river and ordinary watercourse); artificial sources (canals and reservoirs) and a combination of any of these sources. It is essential that when considering risks from flooding and how to manage them, the whole system is considered rather than single sources in isolation. Highway drainage, balancing lakes ordinary watercourse and main rivers function as an integrated system in which all elements are required to function to manage surface water.

Main rivers, sewers and artificial sources are not considered to be 'local' sources of flooding. Consequently they do not fall under the responsibility of Milton Keynes Council and the scope of this Strategy. However, these sources are considered to be significant within Milton Keynes and can combine with local sources to create a flood event. Therefore a brief

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3.2.1 Surface water (pluvial)

Surface water flooding usually occurs when high intensity rainfall generates runoff which flows over the surface of the ground and ponds in low lying areas, before the runoff enters a watercourse or sewer. It can be exacerbated when the ground is saturated and/or when watercourses or road drainage systems have insufficient capacity to cope with the additional surface water runoff or due to a lack of maintenance.

Figure A3 in Appendix A shows the surface water flood risk across Milton Keynes. Areas at risk include the natural low points within the fluvial floodplains of the River Great Ouse and the River Ouzel; along the course of existing drains and small watercourses; behind railway embankments in the north western part of the Borough; and some areas within Newport Pagnell.

Responsible RMA: Milton Keynes Council is responsible as LLFA for strategically managing the risk of surface water flooding.

3.2.2 Groundwater

Groundwater flooding occurs as a result of water rising up from underlying aquifers or from water flowing from springs. This tends to occur after long periods of sustained heavy rainfall and can be sporadic in both location and time, often lasting longer than a river or surface water flood.

High groundwater level conditions may not always lead to widespread groundwater flooding; however, they have the potential to exacerbate the risk of surface water flooding and flooding from rivers by reducing rainfall infiltration capacity, and to increase the risk of sewer flooding through sewer/groundwater interactions.

The areas of Milton Keynes borough which are susceptible to groundwater flooding are shown in Figure A4 in Appendix A. The risks of groundwater flooding are generally confined to fluvial floodplains. A large proportion of the residential area of Newport Pagnell is shown to be at risk of groundwater flooding which has the potential to occur 'at the surface'. Other residential areas shown to be at risk of groundwater flooding 'at the surface' include Bletchley and Fenny Stratford.

Responsible RMA: Milton Keynes Council is responsible as LLFA for managing the risk of groundwater flooding. The Council also works with other organisations, including the Environment Agency, to manage this risk.

3.2.3 Ordinary Watercourse (fluvial)

Ordinary watercourses include every river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows, above ground or culverted, which is not designated as a main river. Ordinary watercourses in Milton Keynes borough include:

- Loughton Brook;
- Broughton Brook;
- Calverton Brook;
- Caldecotte Brook;
- Chicheley Brook; and,
- Springhill Brook.

Figure A1 in Appendix A shows the locations of ordinary watercourses within Milton Keynes borough. Key areas at risk are Stoke Goldington, Tathall End, Lavendon, Calverton and Loughton. Watercourse flooding occurs when water levels rise as a result of high or intense rainfall, resulting in the water flowing over the watercourse bank.

Responsible RMA: Riparian land owners are responsible for managing and maintaining ordinary watercourses within their land ownership. As LLFA, Milton Keynes Council has a responsibility to manage the risk of flooding arising from ordinary watercourses through engagement with riparian owners and enforcing maintenance responsibilities in accordance with the Land Drainage Act 1991. The BGDB is also responsible for managing the risk of flooding arising from ordinary watercourses located within their administrative area.

RMAs have permissive powers of entry (undertaking works on other people's lands / on watercourses under other people's ownership and responsibility) and to maintain, improve and build new flood risk management assets.

3.3 Other sources of flood risk

3.3.1 Main River (fluvial)

River flooding occurs when water levels rise as a result of high or intense rainfall which flows into them, resulting in watercourses overflowing their banks. A main river is defined by the Environment Agency on its Main River Map⁵⁰ and is usually a larger river. Main rivers within Milton Keynes borough include:

- The Great Ouse;
- The River Ouzel;
- Water Eaton Brook;
- Tongwell Brook; and,
- The River Tove.

The city of Milton Keynes was designed so that the majority of the natural functional and engineered floodplain is within linear parks. Most of the city's linear parks are owned and maintained by The Parks Trust although a few areas are owned and maintained by Milton Keynes Council. As a result there are few properties lying with Flood Zones 2 and 3 within the developed areas of the city of Milton Keynes. Figure A5 in Appendix A shows the risk of flooding from main rivers across the Milton Keynes borough. Areas where there are properties at risk include Newport Pagnell, New Bradwell, Bletchley and Water Eaton, Stoney Stratford and Tongwell.

Responsible RMA: Environment Agency (powers to manage the risk of flooding from main rivers) and Riparian land owners (responsible for managing and maintaining watercourses within their land ownership).

3.3.2 Sewer

Sewer flooding usually coincides with heavy rainfall, and may occur if the amount of rainfall exceeds the capacity of the sewer system, the system becomes blocked and/or water surcharges (i.e. rises above the ground) due to high water levels in the receiving watercourse.

On the whole, separate surface water sewers are designed to cope with the vast majority of storms. However, in locations with combined sewers (foul and surface water), rainfall can be so heavy that it overwhelms the combined sewer. Foul sewer flooding also occurs where surface water drainage has been incorrectly connected to the foul sewer (which is not designed to convey the large volumes of water during a storm). When this happens, sewage can overflow from manholes and gullies and flood land, rivers and gardens. It is difficult to disassociate sewer flooding from surface water runoff (for which Milton Keynes Council is responsible for as LLFA).

AWS are responsible for recording incidents related to sewer flooding from their customers. Their records show there have been two properties affected by internal flooding in the areas of Fenny Stratford and Stony Stratford. External flooding has affected a property in Denbigh North, Bletchley, Woburn Sands and Moulsoe/Southern Newport Pagnell.

Responsible RMA: Anglian Water and Independent Water Networks Ltd, as the sewerage undertakers for Milton Keynes.

3.3.3 Artificial sources

Artificial sources include any water bodies not covered under other categories and typically include canals, lakes and reservoirs. In Milton Keynes borough the Grand Union Canal presents a flood risk due to breach or overtopping.

There are eleven impounding reservoirs/storage areas situated within or around Milton Keynes that may present a flood risk in the borough due to failure or overtopping of the structures. These are:

- Caldecotte Lake;
- Willen Lake;
- Simpson Balancing Reservoir;
- Furzton Balancing Lake;
- Tongwell Lake;
- Bradwell Lake;

⁵⁰ Environment Agency website: <u>https://www.gov.uk/government/organisations/environment-agency</u>

- Loughton Lake;
- Balancing ponds associated with Eastern and Western Expansion Areas;
- Wakefield Lodge (Northamptonshire County);
- Towcester Flood Storage Reservoir (Northamptonshire County); and,
- Foxcote/Foscott (Buckinghamshire County).

Within Milton Keynes borough, the Canal and River Trust have 2 records of breach incidents on the Grand Union Canal, recorded in 1808 and 1971. There are 2 records of the Grand Union Canal overtopping to the west of the Milton Keynes borough boundary in South Northamptonshire in 2007 and 2013.

The initial route (subject to further discussions) for the Milton Keynes to Bedford Canal is also shown in Figure 2-2 and Figure A1 in Appendix A.

Responsible RMA: Various RMA's depending on ownership of asset, including Anglian Water, the Environment Agency, Canal and River Trust and neighbouring LLFA's.

3.4 Historic Flooding in Milton Keynes

Prior to the development of the city of Milton Keynes there was regular flooding of the Great Ouse, River Ouzel and Loughton Brook. During the floods of 1947 and 1968 a number of areas around Bletchley, Newport Pagnell, Bradwell, Loughton and Simpson were seriously affected. However, the city of Milton Keynes is unusual as the development of the 'new town' has meant that there have been significant changes to the catchment characteristics, with increased run off from urban areas mitigated by a drainage network of public storm sewers, reengineered watercourses and balancing lakes inherited from predecessor organisations.

Consequently, the drainage network in the city of Milton Keynes is unique and requires ongoing proactive partnership working with RMAs which acknowledges the inherited infrastructure. A normal drainage network would consist of, for example, a residential development drained via a public storm sewer, discharging into a local watercourse, which would then flow into a main river. In contrast, in some areas of Milton Keynes, watercourses within the BGDB catchment discharge into AWS assets, such as Caldecotte Lake (owned and operated by AWS but whose main purpose is an Environment Agency attenuation), and then into Main River.

Figure A6 in Appendix A shows the historic flood incidents which have occurred in the Milton Keynes borough. The most significant flooding in recent years occurred in April 1998 and July 2007, both after heavy rainfall fell on already saturated ground.

Areas in Milton Keynes borough with historic records of fluvial flooding from Main Rivers and ordinary watercourses include Newport Pagnell, Stoney Stratford, Lower Weald, Cosgrove, New Bradwell and Lavendon. In the past, blocked culverts have caused ordinary watercourses to flood Woburn Sands, Shenley Brook End and the Caldecotte Brook.

Data collected as part of the Milton Keynes Level 1 SFRA¹⁷ identified eight recorded incidents of surface water flooding within the Milton Keynes borough, locations including Newport Pagnell, Stoke Goldington, Lavendon, Passenham, Cosgrove and Old Stratford. There are six highways surface water flood records, which identify particular areas at risk in the south of Milton Keynes near Bradwell Abbey and Fenny Stratford. The SFRA also confirms the low significance of groundwater flooding across Milton Keynes, identifying only four recorded incidents of groundwater flooding in Ravenstone, Newport Pagnell, Olney and Stony Stratford.

As a result of a number of flooding events, three Flood Investigation Reports (FIR) have been prepared:

- A FIR for the village of Lavendon following flooding on 14th July 2012⁵¹;
- A FIR for Stoke Goldington following flooding on the 4th June and 2nd July 2007⁵²; and,
- A FIR/Flood Alleviation Scheme Baseline Assessment for Tathall End⁵³ following frequent flooding, most notably in 2007.

The Lavendon FIR was produced in 2012 and revised in 2014 by WSP, in response to severe flooding on the 14th July 2012 which was assigned an approximate return period of a 5% Annual Exceedance Probability (AEP) (1 in 20 year chance of flooding in any one year) event. Flooding occurred as a result of intense rainfall falling on saturated ground due to persistent rainfall combined with a previous wet month. A number of mitigation measures were proposed to alleviate flood risk in Lavendon including surface water attenuation basins, watercourse maintenance and property level protection measures.

⁵¹ WSP (2014). Lavendon, Milton Keynes: Flood Investigation Report.

⁵²WSP (2008). Stoke Goldington Flooding Investigation: Stage 2 Report.

⁵³ WSP (2013). Tathall End, Milton Keynes: Flood Alleviation Scheme – Baseline Assessment.

As of printing, the Lavendon flood alleviation project is underway, with consultants currently running mitigation testing on five possible locations in the village identified during early investigations as sites for possible flood assets. This stage of testing was completed in May 2015 and the Council are now seeking planning permission and other consents to proceed with proposed works in the spring of 2016.

The Stoke Goldington FIR was developed in response to two severe flooding events in Stoke Goldington which occurred on the 4th June and 2nd July 2007. Approximately 50 properties were affected with the first event affecting the south of the village and the second event affecting both the south and north ends of the village. Largely, flooding occurred as a result of overland flows due to a lack of sewer capacity. Proposed mitigation measures generally related to improved highways and surface water drainage.

The FIR/Flood Alleviation Scheme – Baseline Assessment for Tathall End was developed in response to frequent flooding of Tathall End, most notably in June 2007. Modelling of watercourses throughout Tathall End demonstrated out of bank flow in a number of cross-sections for the 20% AEP (1 in 5 year chance of flooding in any one year) event and the majority of cross-sections during the 5% AEP (1 in 20 year chance of flooding in any one year), 1% AEP (1 in 100 year chance of flooding in any one year) and 1% AEP plus climate change event runs. It is suggest that this is as a result of insufficient watercourse capacity. The recommendations from the baseline hydraulic model assessment are that the mitigation options to reduce the flooding within Tathall End could take the form of channel maintenance and improvement, upstream attenuation basins and / or downstream attenuation basins.

3.5 Future Risk of Flooding

Milton Keynes borough is faced by a number of pressures which could influence flood risk in the future, both adversely and beneficially, these include:

- Climate change leading to more intense periods of rainfall, increasing the frequency of large-scale flooding and the chances of flooding occurring where it has not been experienced before;
- Heightened river levels preventing surface water from draining from riverside development;
- Population increase leading to increased demand for development and key services;
- Pressure for new development in areas at risk of flooding or changes in land use which increase risk elsewhere;
- Deterioration of structures or features that currently protect us from flooding and thus require maintenance or replacement;
- Lack of maintenance or replacement of said structure or features of the existing strategic drainage network;
- Public sector cuts leading to reduced maintenance activities and reduced central government funding for flood alleviation schemes; and
- More stringent building regulations and new developments which can contribute to reducing flood risk.

3.5.1 Impact of Climate Change

Climate change is considered to be one of the most significant future pressures in terms of flood risk. Current predictions of future rainfall indicate that increasing numbers of severe and extreme weather events in the future should be expected. Intense storms are the main cause of surface water flooding, which would also increase in frequency. Consequently, the number of properties, businesses and critical infrastructure at risk will also increase.

Implications for Flood Risk

Climate change can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability. Wetter winters and more of this rain falling in wet spells may increase river flooding in both rural and heavily urbanised catchments.

In Milton Keynes borough, more intense rainfall is likely to result in an increase in localised surface water flooding. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers. Rising river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses.

Where appropriate, local assessments are needed to understand climate impacts in detail, including effects from other factors like land use.

Adapting to Change

Past emissions mean climate change is inevitable and it is essential that Milton Keynes Council responds by planning ahead. Milton Keynes Council can prepare by understanding the current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits.

Milton Keynes Council considers climate change adaptation and mitigation to be essential to sustainability and sets high standards for new developments accordingly, such as the requirement for new developments to include renewable energy and sustainable design. The Milton Keynes Council's Corporate Plan (2012-2016)⁵⁴ aims to establish exemplar projects which will further distinguish Milton Keynes as a leading Smart City with a low carbon economy.

The Council's Low Carbon Living Strategy (2010)⁵⁵ and Action Plan (2012)⁵⁶ shows how communities across the Milton Keynes borough can reduce greenhouse gas emissions and therefore contribute to the mitigation of global climate change through:

- The integration of sustainability and carbon reductions into the planning and delivery of the Council aims and objectives;
- A reduction in the authority's carbon footprint; and,
- A demonstration of community leadership in tacking climate change and sustainability issues including reducing the overall carbon footprint of the Borough⁵⁷.

The Low Carbon Living Strategy and Action Plan has the overall aim of reducing carbon emissions in the Milton Keynes borough by 40% per capita by 2020 and to be at the forefront of low carbon living, nationally and internationally. In accordance with this, the upcoming new Local Plan for Milton Keynes borough, Plan:MK has the environmental objective to 'Combat climate change by reducing levels of carbon dioxide'. The Imagine MK 2050 Strategy (2014)⁵⁸ builds on the Low Carbon Living Strategy, and target for Milton Keynes to reduce carbon emissions per person by 40% by 2020 by adding to near zero carbon by 2050 or sooner.

Although the broad climate change picture is clear, Milton Keynes Council has to make local decisions against deeper uncertainty. The Council will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that the vulnerability of communities and businesses to flooding does not increase.

Sustainable development and drainage, including the use of Sustainable Drainage Systems (SuDS), will help to adapt to climate change and manage the risk of damaging floods in future.

Including allowances for Climate Change in Flood Risk Management

The NPPF and supporting guidance set out the allowances required for climate change to be used in Flood Risk Assessments. The Environment Agency has produced guidance on Climate Change Allowances for Planners⁵⁹ to support the NPPF to outline requirements for preparing FRAs for Local Plans and planning applications. This includes recommended national precautionary sensitivity ranges for peak rainfall intensity and peak river flow suitable for use in the planning system (Table 3-8).

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow +10%		+20%		

Table 3-8 Recommended national precautionary sensitivity ranges for peak rainfall intensity and peak river flow

⁵⁴ Milton Keynes Council's Corporate Plan (2012-2016) <u>http://www.milton-keynes.gov.uk/your-council-and-elections/council-information-and-</u>

accounts/strategies-plans-and-policies/corporate-plan-2012-16 ⁵⁵ Milton Keynes Council (2010) Milton Keynes Low Carbon Living Strategy <u>www.milton-keynes.gov.uk/environmental-health-and-trading-standards/mk-low-</u> carbon-living/low-carbon-living-strategy-and-action-plan

Milton Keynes Council (2012) Milton Keynes Low Carbon Action Plan www.milton-keynes.gov.uk/environmental-health-and-trading-standards/mk-lowcarbon-living/low-carbon-living-strategy-and-action-plan

 ⁵⁷ <u>http://www.milton-keynes.gov.uk/environmental-health-and-trading-standards/mk-low-carbon-living/low-carbon-living-strategy-and-action-plan</u>
 ⁵⁸ Milton Keynes Council (2014) Imagine MK 2050 Strategy, A roadmap for a sustainable Milton Keynes .
 ⁵⁹ Environment Agency (September 2013) Climate Change Allowances for Planners – Guidance to Support the National Planning Policy Framework. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296964/LIT_8496_5306da.pdf

Existing flood risk studies along with wider environmental plans and programmes covering the Milton Keynes borough have assessed the impacts of climate change and flood risk and provide an evidence base for understanding how such challenges may impact current and future communities, businesses and the environment. Examples of these studies are provided in Table 3.4 below.

Table 3.4: Milton Keynes Flood Risk and Wider Environmental Studies

Name of Study	Summary
Milton Keynes Council Level 1 SFRA Update (2015)	The recommended contingency allowances for recommended national precautionary sensitivity ranges for peak rainfall intensity, peak river flow is modelled to assess the extent of climate change impact on flood extents.
Great Ouse CFMP (2010)	The impact of climate change on flood risk is considered using a number of different scenarios such as increases in urbanisation, peak flows of watercourses and sea level rise. Climate change was subsequently shown to have a significant impact upon flood risk.
Anglian District River Basin Management Plan (2014) The RBMP highlights the likely effects of climate change on known pressures in environment of the Anglian District. Climate change is likely to have a high level for abstraction and other artificial flow regulation and a high level of severity for r (nitrate and phosphate), sediment, marine acidification (medium/high).	
Milton Keynes Council Core Strategy (2013) The Core Strategy groups tackling climate change with building sustainable con and identifies climate change as a threat to the Milton Keynes borough. Opport arise as a result of climate change are highlighted along with potential mitigatio relating to the wider environment such as maintaining biodiversity.	
Milton Keynes Council Low Carbon Strategy and Action Plan (2010)	
Plan:MK	The Climate Change and Sustainability Topic Paper of Plan:MK provides an environmental baseline relating to climate change, policy background and areas for future development and funding such as renewable energy. The topic paper also includes information relating to Flood and Water Management. SuDS and Integrated Water Management are discussed alongside the avoidance of flood prone areas, water quality and previous report findings such as the Milton Keynes Water Cycle Study.
Buckinghamshire and Milton Keynes Biodiversity Action Plan (2000)	Highlights how flora and fauna may be affected by climate change and how wildlife can adapt to climate change pressures.
Milton Keynes Council Outline Water Cycle Study (2008)	Discusses the impacts of climate change on water supply, identifies a flood risk baseline and future flood projections which incorporate climate change.

3.6 Critical Drainage Catchments

3.6.1 Local Flood Risk Overview

Little historical information is available to quantify the risk associated with flooding from ordinary watercourses. Where historical evidence is available this can be used to identify those areas potentially at greater risk in the future. However, identifying a source of flooding can be difficult due to the presence of other potential sources of flooding acting cumulatively. There are also a limited number of flooding incidents attributed to ordinary watercourses across the Borough.

In regards to groundwater, the British geological Survey's (BGS) Areas Susceptible to Groundwater Flooding map shown in Figure A4 in Appendix A identifies areas which are at varying risks of groundwater flooding. This mapping provides an indication as to where there is the potential for groundwater flooding and should be considered alongside other datasets relating to local flooding sources in order to ascertain where instances of cumulative flooding may arise.

On behalf of Milton Keynes Council, the Environment Agency has undertaken national modelling of the risk of flooding from surface water and published the mapping outcomes on their website in December 2013. The Risk of Flooding from

Surface Water Map⁶⁰ identifies the risk of surface water flooding at a strategic scale, utilising up to date datasets and refined modelling techniques to provide a useful means whereby surface water flood risk extents can be identified.

Surface Water flood risk is banded based on the following:

- High Risk: at risk of flooding for a rainfall event with a 3.3% AEP (1 in 30 year chance of flooding in any one year);
- Medium Risk: at risk of flooding for a rainfall event with a 1% AEP (1 in 100 year chance of flooding in any one year); and,
- Low Risk: at risk of flooding for a rainfall event with a 0.1% AEP (1 in 1000 year chance of flooding in any one year).

A high level assessment of the risk to properties, critical infrastructure, transport, heritage and the environment has been undertaken for this Strategy using the Environment Agency's National Receptor Database and the Risk of Flooding from Surface Water mapping to provide an indication of the level of risk facing Milton Keynes. This is presented in Figure 3.1 and Table 3.5.

⁶⁰ Flood Risk from Surface Water maps, also known as the updated Flood Map for Surface Water (uFMfSW) dataset, is owned by Milton Keynes Council (for their respective administrative area). Available to view here: <u>http://watermaps.environment-</u> agency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw#x=357683&y=355134&scale=2





Type of Property		Risk		
		High	Medium	Low
Residential		1,753	4,692	15,161
	Commercial & Industrial	173	384	969
	Emergency Service Stations* (Fire, Police & Ambulance)	4	5	9
	Hospitals*	1	1	1
	Schools and Education Facilities*	29	53	90
Non Residential	Surgery or Health Care*	7	11	22
	Residential Home*	1	2	3
	Sewage Treatment*	2	4	5
	Electricity Sub Station or Building*	3	8	25
	Other ⁶¹	635	1,314	3,445
	Total	855	1,782	4,569
Residential and Non-Residential Total		2,608	6,474	19,730

Table 3.5: Number of properties at Risk of Flooding in Milton Keynes Borough (based on Environment Agency updated Flood Map for Surface Water (uFMfSW))

*Identified as Critical Infrastructure

To summarise Table 3.5, the high level assessment identified the total number of properties in the following risk bands:

- At High Risk: 1,753 residential properties, 173 commercial and industrial properties, 29 schools and education facilities, seven surgeries/health care properties, four emergency service stations, two sewage treatment works, one hospital, and one residential home.
- At Medium Risk: 4,692 residential properties, 384 commercial and industrial properties, 53 schools and education facilities, 11 surgeries/health care properties, five emergency service stations, four sewage treatment works, two residential homes and one hospital.
- At Low Risk: 15,161 residential properties, 969 commercial and industrial properties, 90 schools and education facilities, 22 surgeries/health care properties, nine emergency service stations, five sewage treatment works, three residential homes and one hospital.

3.6.2 Critical Drainage Catchments in Milton Keynes

Mapping of surface water flood risk (Figure A3 in Appendix A) shows that the risk of flooding from surface water is widespread across the Milton Keynes borough, with particularly extensive flow paths in the northern extent of the Borough. There are a number of urban areas such as Newport Pagnell and the city of Milton Keynes which are shown to have a large number of properties in close proximity to each other which may be at Medium to High risk of flooding from surface water.

Alongside this Strategy, a Surface Water Management Plan (SWMP) has been developed which outlines the preferred surface water management strategy across the Milton Keynes borough. The SWMP has defined critical drainage catchments (CDCs) as 'a discrete geographic area (usually a hydrological catchment) where multiple or interlinked sources of flood risk cause flooding during a severe rainfall event thereby affecting people, property or local infrastructure.'

The CDC comprises the upstream 'contributing' catchment, the influencing drainage catchments, surface water catchments and, where appropriate, a downstream area if this can have an influence on CDC. In spatially defining the CDC the following have been taken into account:

- Flood depth and extent areas shown within the uFMfSW, to predicted deep or extensive levels of surface water flooding;
- Flood hazard –areas shown within the uFMfSW, to predict a high hazard as a result of flooding (hazards is defined as a function of flood depth and velocity);

⁶¹ Majority of 'Other' contains unclassified buildings where the building type has not be verified, due to it being recently built. 'Other' also includes churches, community halls, sport/leisure centres, hotels, hostels, library, museums, cinemas and public toilets.

- Potential impact on people, properties and critical infrastructure including residential properties, main roads (access to hospitals or evacuation routes), rail routes, rail stations, hospitals and schools;
- Groundwater flood risk based on the groundwater assessment and BGS dataset identifying areas most susceptible to groundwater flooding;
- **Significant underground linkages** including underpasses, tunnels, large diameter pipelines (surface water, sewer or combined) or culverted rivers; and,
- Cross boundary linkages CDCs have not been curtailed by political or administrative boundaries.

CDCs are listed in Table 3.6 and shown in Figure 3.2 and Figure A7 in Appendix A.

Table 3.6: Critical Drainage Catchments (CDCs) in Milton Keynes

CDC ID	CDC Name
CDC1	Ravenstone
CDC2	Lavendon
CDC3	Sherrington
CDC4	Woburn Sands
CDC5	Eaglestone
CDC6	Downs Barn and Conniburrow
CDC7	Stoke Goldington
CDC8	Newport Pagnell
CDC9	Bletchley and Fenny Stratford
CDC10	Olney
CDC11	Brinklow
CDC12	Medbourne/Crownhill
CDC13	Wymbush/ Two Mile
CDC14	Bradwell Abbey
CDC15	Stony Stratford
CDC16	Wolverton
CDC17	Oldbrook
CDC18	Bradwell (west of Conniburrow)
CDC19	Bradwell
CDC20	West Bletchley
CDC21	Tathall End
CDC22	Calverton
CDC23	Bow Brickhill
CDC24	Haversham



Figure 3.2 Critical Drainage Catchments in Milton Keynes
4 Objectives for Managing Flood Risk

4.1 Milton Keynes Local Flood Risk Objectives

The following objectives for managing local flood risk in Milton Keynes have been developed and agreed with the RMAs through a series of workshops:

Milton Keynes Local Objectives

- 1) Ensure that drainage management is tailored to Milton Keynes unique drainage system.
- 2) Improve the Council's understanding of food risk from all sources.
- 3) Ensure future development does not have a negative impact on flood risk and lowers the risk where possible.
- 4) Make best use of resources for maximum protection from flooding.
- 5) Improve public awareness of flooding and help communities to become more resilient to flooding.
- 6) Improve communications between asset owners and build on existing partnership working.
- 7) Ensure emergency planning is linked to the Council's best understanding of the risks.

4.2 National Flood Risk Management Objectives

Milton Keynes Council has developed the objectives of this Strategy in line with the Environment Agency's National Flood and Coastal Erosion Risk Management Strategy for England⁶². This sets out the following national objectives for flood risk management;

- Understand the risks understanding the risks of flooding and coastal erosion, working together to put in place longterm plans to manage these risks and making sure that other plans take account of them;
- Prevent inappropriate development avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing risks;
- Manage the likelihood of flooding building, maintaining and improving flood and coastal erosion management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society;
- Help people to manage their own risk increasing public awareness of the risk that remains and engaging with
 people at risk to encourage them to take action to manage the risks that they face and to make their property more
 resilient; and,
- Improve flood prediction, warning and post-flood recovery improving the detection, forecasting and issue of warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.

4.3 Guiding Principles for Local Flood Risk Management

The National Strategy aims and objectives are supported by six high-level principles listed in Figure 4.1, to guide decisions on risk management activities, and the process by which they are taken, at both a national and local level. Milton Keynes

⁶² Environment Agency (2011) National flood and coastal erosion risk management strategic for England <u>http://www.environment-agency.gov.uk/research/policy/130073.aspx</u>

Council has used these to guide the development of objectives and identification of measures to deliver local flood risk management within Milton Keynes borough.



Figure 4.1: Guiding Principles for Local Flood Risk Management

5 Objective 1:

"Ensure that drainage management is tailored to Milton Keynes unique drainage system"

Recognising the potential for the development of Milton Keynes to significantly alter catchment characteristics, the Town was developed with the implementation of an innovative, strategic drainage system, based on the principles of sustainable drainage, with the aim of mitigating the impacts of the new town development and improving historical flooding issues in the likes of Newport Pagnell.

Designed around a strategic drainage infrastructure network of piped sewers, modified watercourses and a number of strategic flood control lakes, the drainage system, based on a design standard of the 1947 flood event, was designed with a capacity sufficient for the long-term development of the Milton Keynes Designated Urban Area, as envisaged in the original masterplan.

Through implementation of this infrastructure and the continued work of Risk Management Authority partners in promoting and managing this strategic approach, it has been continually successful in mitigating against flood risk and allowing for the continued development of Milton Keynes, whilst also providing multiple, social, ecological and amenity benefits.

The success of this approach has also led to its continued implementation in enabling the urban area of Milton Keynes to expand beyond its original designated boundaries, with strategic drainage infrastructure, connected to the existing system, being developed within both the Western and Eastern Expansion Areas.

With development within Milton Keynes now due to exceed that which was originally planned for and continued further growth envisaged, potentially through expansion and/or infill, it is essential that there is no complacency towards drainage and that there is continued investment, maintenance and improvement to the innovative strategic drainage network to ensure that it is functioning at its intended capacity and is fit-for-purpose for the continuing growth of Milton Keynes.

Measure 1.1: Improve the Council's understanding of the drainage capacity in the Milton Keynes urban area and its resilience to development.

The city of Milton Keynes was originally developed with sustainable drainage as a key part of the design. As development within the town has now exceeded the amount originally envisaged it is essential that Milton Keynes Council obtains a greater understanding of how this development has impacted the resilience of the drainage system. The Council therefore needs to:

- Ensure that the whole drainage system is working together;
- Assess the volumetric capacity of the drainage system; and,
- Ensure that the system can incorporate future growth.

In 2000, a Milton Keynes Drainage Study was produced by Halcrow to assess the capacity of the drainage system. It identified that there was limited knowledge and information on the system, which limited the extent to which the system's future performance could be appraised. In particular, it was recommended that a greater understanding of the balancing lakes and control gates operating procedures was required to enable future assessments of localised development impacts.

Milton Keynes has not experienced a flood event that has exceeded the capacity of the existing drainage system and its limits for further development are unknown. Therefore it is essential that an update of the Milton Keynes Drainage Study is undertaken, assessing the existing drainage capacity through modelling different rainfall events, to improve understanding of resilience thresholds.

Proportionate and risk based approach

Measure 1.2: Protect the effective maintenance of the current drainage system in the Milton Keynes urban area for resilience to future flood risks.

As an asset owner, riparian owner and LLFA, Milton Keynes Council is responsible for, and has permissive powers to carry out the maintenance of highway gullies, drainage channels, culverts and trash screens. Ensuring these are clear of vegetation and operating efficiently is a vital part of managing the likelihood of flooding. The BGDB also has an active watercourse maintenance programme and proactively exercise its permissive powers, as well as adopting and maintaining strategic SuDS to ensure they continue to function. A Memorandum of Understanding between the BGDB and the Parks Trust exists for partnership working on watercourses in linear parks.

The Council will review and formalise an inspection and maintenance regime of all their drainage infrastructure assets, to protect the effective maintenance of the drainage system, improve flood risk management and prioritise resources to those assets and areas at greatest risk. The Council will report the inspections in electronic format to ensure accuracy and enable easy reference.

Resources and funding is always limited, however, Milton Keynes Council will ensure resources are used as efficiently as possible. The Milton Keynes Asset Register (currently being prepared) will be used to identify vulnerable assets and infrastructure, and prioritise maintenance regimes based on available funding. The Council will map the locations and conditions of their drainage assets to improve the spatial understanding of assets, and also assess the implications of a reduced maintenance programme on local flood risk.

It is important to clarify responsibilities and acknowledge where a partnership approach is required. Milton Keynes Council will review maintenance plans for different RMAs and Council assets and identify where responsibilities and maintenance targets overlap (Measure 6.3).

A catchment based approach	Community focus and partnership working	
Beneficiaries encouraged to invest		

Measure 1.3: Ensure drainage infrastructure for new development is future proofed for its design life.

Assessment of flood risk and review of drainage strategies for new developments is necessary to ensure drainage infrastructure will perform adequately during its design life. Where necessary, separation of surface water from the public sewer network should be implemented, with surface water discharged to ground/watercourses. Developers are also expected to limit flows entering the network. Where possible watercourses should remain open (i.e. culverting should be resisted) and opportunities should be sort for day-lighting of watercourses. Milton Keynes Council will therefore review existing and emerging Council policies with regards to drainage infrastructure for new development.



Multiple benefits

6 Objective 2:

"Improve the Council's understanding of flood risk from all sources"

Measure 2.1: Improve the Council's understanding of surface water flood risk in the Milton Keynes borough

Understanding the risk of surface water flooding is essential for flood risk management in the Milton Keynes borough. In order to do this Milton Keynes Council has developed a Surface Water Management Plan, which assesses the flood risk throughout the Borough from sewers, drains, groundwater, and runoff from land, ordinary watercourses and ditches that occurs as a result of heavy rainfall. It identifies the critical drainage catchments (CDCs), which are the catchments within Milton Keynes that are most at risk from surface water flooding. These CDCs are priority areas to focus assessments for mitigation measures in order to reduce flood risk.

Proportionate and risk based approach

A catchment based approach

Measure 2.2: Improve the Council's understanding of groundwater flood risk in the Milton Keynes borough

There are very few reports and evidence of groundwater flooding in Milton Keynes. The Surface Water Management Plan (described in Measure 2.1) will include an assessment of groundwater flooding in Milton Keynes using BGS data and identify the areas considered to be at risk from flooding.

Milton Keynes Council will aim to provide in-house training for planning officers to improve their awareness of what constitutes and causes groundwater flooding.

Proportionate and Risk Based Approach

A catchment based approach

Measure 2.3: Improve the Council's understanding of ordinary watercourse flood risk in the Milton Keynes borough

Milton Keynes borough contains a number of ordinary watercourses, however there is relatively little information available on the flood risk these pose. Therefore we do not have a full understanding of how they may behave during flood events and their role in influencing other watercourses which they connect into. As consenting authority for works to ordinary watercourses outside of IDB areas, it is important we understand how any proposed works may impact the local hydrology. An improved understanding of the watercourses will also allow better informed decisions regarding planning applications in proximity of a watercourse or which propose to discharge to a watercourse. The council will look to prioritise modelling of ordinary watercourses which could impact new development areas or have known flooding problems.

Proportionate and Risk Based Approach

A catchment based approach

Measure 2.4: Develop a procedure for flood investigations under Section 19.

Milton Keynes Council will develop a procedure for investigating flood events in line with their legislative duties under the Flood and Water Management Act 2010, collecting information from available sources including local residents, businesses, online surveys and meteorological data and working with other RMAs. The flood investigation policy and criteria for 'significant' flooding incidents will be reviewed. Milton Keynes Council will respond to all reported flooding incidents and will investigate 'significant' flooding incidents.

To support this measure, Milton Keynes Council will establish and maintain a centralised Flood Database to record and share historic and reported flooding incidents from all RMAs. Much of the historical information collated as part of the

development of this Strategy is valuable information for improving understanding and management of flood risk and will be incorporated into the Flood Database. The Council will also collate and incorporate flooding reports from the highways maintenance system records and the customer call centre records, where these are readily available. Emerging technology, such as mobile apps and web-based tools, offer the opportunity to capture flood information and photographic evidence from the public in a quick and efficient way. The Council will investigate such technologies to improve the recording and reporting of flooding information across the Milton Keynes borough.

Milton Keynes Council will ensure there are clear lines of communication in how the public can report flooding incidents and the best way to do this. The Council will work closely with the local Parish council's to formalise their role in community awareness of recording flood events.

Proportionate and risk based approach

7 Objective 3:

"Ensure future development does not have a negative impact on flood risk and lowers the risk where possible"

Measure 3.1: Review Milton Keynes Council planning policy and guidance in relation to flood risk

Assessment of flood risk and review of drainage strategies for new developments is necessary to ensure drainage infrastructure will perform adequately during its design life. Milton Keynes Council will therefore review existing and emerging planning policies with regards to drainage infrastructure for new development, addressing the requirement for sustainable drainage in the borough. It is also important to outline all designation powers, consenting powers and byelaws from each RMA, to make it clear what is required of developers.

The Milton Keynes Drainage Strategy SPG (2004)⁶³ aims to guide developers on the following aspects related to drainage and flood risk throughout the Milton Keynes borough:

- Fluvial flood zones and risks and the constraints imposed upon development;
- What strategic measures are required to facilitate further development and how these measures may occur in conjunction with localised measures such as SuDS; and,
- Considerations relating to conservation and amenity, funding and securing reliable, long-term maintenance.

The SPG promotes the utilisation of sustainable drainage where applicable and highlights how they can be used to overcome issues associated with conventional drainage systems. It demonstrates how SuDS can be used throughout the Milton Keynes borough, alongside other surface water management infrastructure such as balancing lakes to develop blue infrastructure which derives multiple benefits relating to amenity, nature conservation, water quality etc.

The Milton Keynes' Drainage SPG is to be reviewed in order to reflect changes to national planning policy due in 2016. It will continue to be a resource for the effective implementation of SuDS throughout the borough where appropriate and will endeavour to deliver multiple benefits where practicable.

In order to minimise any development outside of Milton Keynes borough impacting on the drainage within the borough, Milton Keynes Council will look into developing a Memorandum of Understanding (MoU) with neighbouring LPAs to ensure consultation on any planning applications close the border.



⁶³ Milton Keynes Council (2004) Milton Keynes Drainage Strategy – Development and Flood Risk Supplementary Planning Guidance

Measure 3.2: Ensure Milton Keynes Council is able to continually fulfil its duty in relation to the SuDS policy changes in April 2015

Following the Government announcement that from 6th April 2015 all major developments must demonstrate prioritising of SuDS, it is Milton Keynes Council's duty, as Local Planning Authority, to enforce this policy through the planning application process. Suitable surface water mitigation measures will need to be incorporated into new and redevelopment plans in order to reduce and manage surface water flood risk to, and posed by, proposed development and to provide wider environmental benefits.

In-line with these changes to planning policy, Milton Keynes Council, as Lead Local Flood Authority for the Borough, have also become the Statutory Consultee to the planning process in relation to surface water and SuDS for all major development planning applications, and are expected to provide technical advice to assist the planning department in assessing surface water drainage on new development.

To date Milton Keynes Council have produced some initial guidance and a standard pro-forma to provide to developers and have also carried out basic in-house training for all Planning staff on SuDS requirements and benefits. Work is also ongoing to fully assess the likely resource needed to carry out these new duties long-term.

In order to continually fulfil these duties it is essential that the Council ensures that the resources and technical support required are easily available and that all guidance and standing advice is regularly reviewed so as to promote the benefits of SuDS and provide developers and applicants with the best possible advice.

To this end the Council will:

- Review the resources required to carry out the LLFA's new statutory consultee role and ensure they are put in place so as to not impact upon the performance of the planning department;
- Review local SuDS guidance and advice documents.

Sustainability

Measure 3.3: Investigate ways to manage urban creep

Urban creep is the gradual reduction of permeable surfaces in urban areas due to creating patios and driveways. This results in increased surface water runoff, as rainwater is unable to infiltrate the ground, which exacerbates local surface water and sewer flooding issues.

Milton Keynes Council will incorporate caveats into their planning policy to cover the risk of paving over driveways. An allowance for urban creep must be included in the design of the drainage system over the lifetime of the proposed development with SuDS and permeable surfaces being promoted where possible.

A catchment based approach

Sustainability

Measure 3.4: Improve the Council's understanding of how the provision of SuDS will lower the risk of flooding

Milton Keynes Council views SuDS as an integral element to any new and existing development and actively encourages all developers to incorporate and, where possible, retrofit SuDS into their developments. If properly managed, new development can actually serve to reduce the risk of flooding, in particular surface water flooding.

In order to support planning applications, the Council are keen to improve their understanding of how SuDS can reduce the risk of flooding in Milton Keynes. The Surface Water Management Plan (described in Measure 2.1) will identify areas within the borough that are suitable for infiltration and attenuation SuDS, and discuss the different methods that can be used. The successful model, which has been employed for a number of existing SuDS set within parkland, will continue to be considered in new growth areas. These SuDS have been adopted by the Milton Keynes Parks Trust with a one-off commuted sum payment to cover the costs of future maintenance.

Milton Keynes Council will look to develop site-specific SuDS case studies, to model the influence of SuDS in flood prone areas and improve understanding of SuDS maintenance.

As well as reducing flood risk, multiple benefits can include improved water quality, improved biodiversity, improvements to public green space and streetscapes, subsequently improving human health and wellbeing. In order to help encourage the use of SuDS to achieve multiple benefits, Milton Keynes Council will train and educate existing Council staff on the benefits of using SuDS as an alternative to traditional drainage, as well as improving the understanding of the costs associated with the implementation of SuDS over traditional drainage on the highway or public spaces.

Milton Keynes Council will liaise with RMAs to identify opportunities where flood risk management activities can be aligned with other non-flood risk policies or plans to deliver wider benefits. The Council will also use regional partnerships to share new findings and best practice techniques.

Proportionate and risk based approach	A catchment based approach	
Community focus and partnership working	Sustainability	

8 Objective 4:

"Make best use of resources for maximum protection from flooding"

Measure 4.1: Investigate where new technologies can help lower risk

Milton Keynes Council recognises that new technologies, which allow for improved monitoring of rainfall, extreme weather forecasts and flooding, are important tools that could be used to predict, prevent and protect against flood risk. The Council will consider how these new technologies could be used within Milton Keynes to help improve flood warning and flood prevention, to help lower flood risk in the future.

Milton Keynes Council has plans to install flood gates and telemetry in Little Linford Lane, which is a flooding hotspot, to help improve the flood warning system. If this is successful, further options for purchasing and installing telemetry on other sections of the road network in Milton Keynes will be considered. The installation of new telemetry at this location would link with the existing telemetry, operated by the Environment Agency upstream of the site.

Proportionate and risk based approach

Multiple benefits

Measure 4.2: Monitor external sources of funding for ongoing flood risk management

Flood risk management activities will require funding from a variety of sources, both internal and external to the Council. Across the UK, the primary funding sources to date have been through central government funding, however, there are significant pressures on these funding sources in the current economic climate, and in the future there will be greater emphasis on LLFAs to fund activities and schemes from their own or alternative local sources of funding.

To address this, Milton Keynes Council will explore all potential funding opportunities for flood and/or water management, and review the list of funding opportunities every six months. Schemes or activities with multiple benefits (for example, habitat restoration or urban greening which improves air and water quality whilst also reducing surface water flood risk) could open up more opportunities for funding. The Council recognises the importance of thinking more broadly with regards to funding and seeking those opportunities where more than one benefit can be achieved.

Beneficiaries encouraged to invest

Multiple benefits

Measure 4.3: Understand how the Council can work more effectively with landowners

It is important land owners understand their role and responsibilities in reducing flood risk from potential flood sources present on their property. In specific areas at risk of flooding, Milton Keynes Council will organise to meet with landowner representatives in order to understand their priorities and communicate the Council's duties as a Risk Management Authority.

It may be possible to link this measure to the catchment based approach of the Flood and Coastal Erosion Risk Management Grant in Aid, which landowners can apply for when seeking to reduce flood risk on catchment wide initiatives.

In some instances, ownership of assets or watercourses is not known or recorded. Where possible, Milton Keynes Council will identify ownership for ordinary watercourses and record ownership in a centralised database. The Council will improve the information on their website about riparian responsibilities regarding ordinary watercourse maintenance.

Community focus and partnership working

A catchment based approach

9 Objective 5:

"Improve public awareness of flooding and help communities to become more resilient to flooding"

Measure 5.1: Development of new communication tools

Information on flood risk and how to prepare for it needs to be as accessible as possible. Milton Keynes Council will develop a dedicated flood information area on their website, improving the availability of information on local flood risk, including all the sources of flood risk in Milton Keynes, the Council's policies on flood risk and what to do in the event of flooding. It will also include information on how to report a flood incident. In line with the results from the public consultation, Milton Keynes Council will also use the Live MK council magazine, Parish newsletters and local newspapers to disseminate the latest Milton Keynes flood alleviation measures.

The Council will also be looking at more effective mechanisms to capture flood information from the public. Whilst risk is assessed on a national scale by the Environment Agency, local people can often provide more accurate information regarding locations that flood and the frequency of flooding. This local knowledge is of great importance in informing the most efficient allocation of resources in future flood management.

Proportionate and Risk Based Approach

Community focus and partnership working

Measure 5.2: Improve education about managed flooding in the public realm.

Education is an important method in raising awareness about the causes of flooding, flood risk and managed flooding in the local area. This is of particular importance to the managed flooding of public spaces, such as the balancing ponds and linear parks in the city of Milton Keynes. Therefore Milton Keynes Council intend to improve public understanding by providing public information signs for linear parks and balancing ponds to explain their role in flood management, alongside water safety signs expanding on existing signage displayed by the Milton Keynes Parks Trust for some of the large balancing lakes. The Council will also use their website to provide information to the public on managed flooding in the city of Milton Keynes.

Proportionate and Risk Based Approach

Community focus and partnership working

Measure 5.3: Encourage community awareness and community level flood resilience through local actions.

Milton Keynes Council will offer support to Parish Councils that want to set up local flood plans or groups. A community flood plan or group enables those at risk of flooding to monitor the risk and act together in advance of a flood event in order to reduce harm to people or damage to property. The Council will provide information to community groups and resident associations on how they can develop a community flood plan and set up a flood group or flood warden service. This will include regularly reviewing and maintaining their Council webpages to include the latest flood risk studies for the Borough.

Community focus and partnership working

Measure 5.4: Improve awareness of individuals influence on flood risk

Making flood relevant information freely available is an important part in helping people to manage their own risk. Milton Keynes Council will therefore ensure information about flood risk in the Borough is made available to the public to inform residents and businesses on how they can help themselves, including information on property level protection. The

Council will aim to do this by providing information on their Council website, in local newspapers, to Parish Councils, as well as highlighting drainage issues in their Highways Roadshows.

A number of free online tools are available to the public, such as the Environment Agency's 'What's in your backyard?' interactive maps⁶⁴, and the National Flood Forum⁶⁵ which provide guidance to assist with the production of risk assessments, action plans and continuity plans. Milton Keynes Council recommends residents and businesses use these tools, and develop initiatives to encourage them to proactively reduce their own risk (e.g. de-paving front gardens to provide permeable surfaces which reduce surface water runoff) to help prevent or reduce the severity of a flood incident.

A key issue is to make sure that riparian owners are aware of their rights and responsibilities. Milton Keynes Council will make riparian owners aware of the Environment Agency's Living on the Edge⁶⁶ document and engage with riparian owners of higher risk watercourses to agree maintenance activities and frequency, and highlight the benefits of these activities. The Council will update their website to include information on riparian ownership rights and responsibilities.

Other key topics to highlight include making the public aware of how an individual's actions directly impact flood risk, e.g. fly tipping blocking a drain.

With regards to sewer flooding, 80% of floods AWS deal with are related to blockages. There is a need for greater public knowledge relating to how to correctly dispose of fat, oil and grease (FOG) and 'unflushables', such as wipes, so as to prevent sewer blockages. AWS have launched their Keep It Clear campaign, further information for which can be found at http://keep-it-clear.co.uk/. Milton Keynes Council will also promote this campaign through the Council's website.

Community focus and partnership working

Beneficiaries encouraged to invest

⁶⁴ Environment Agency 'What's in Your Backyard?' website: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

⁶⁵ National Flood Forum website: <u>http://www.nationalfloodforum.org.uk/at-risk-of-flooding-2/</u>

⁶⁶ Environment Agency (2014) Living on the Edge. <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/403435/LIT_7114.pdf</u>

10 Objective 6:

"Improve communications between asset owners and build on existing partnership working"

Measure 6.1: Clarify asset ownership and/or maintenance responsibility where it is not clearly established.

The RMAs in Milton Keynes (as described in Section 2) all have responsibilities and permissive powers for maintaining the watercourses and structures that they own or have jurisdiction over. It is important to clarify these responsibilities and powers for all RMAs and acknowledge where a partnership approach is required. In particular, all riparian owners within Milton Keynes need to be identified and make sure they are aware of their responsibilities with regards to flood risk. It is critical that each RMA proactively exercises their powers to manage flood risk, such as carrying out channel maintenance to ensure there is adequate capacity to convey design flows.

Under the Flood and Water Management Act 2010, Milton Keynes Council has a statutory duty to create and maintain an asset register. This is a database of structures or features considered to have a significant effect on flood risk, including information on location, ownership and state of repair. The register will be used to identify vulnerable assets and infrastructure, and prioritise maintenance regimes based on available funding.

Proportionate and risk based approach

Community focus and partnership working

A catchment based approach

Measure 6.2: Build on the Council's knowledge about hydrological linkages in the catchment.

It is important that a catchment based approach is used to manage flood risk in Milton Keynes and the all resources available from all stakeholders are considered. Milton Keynes Council will collate all the existing hydraulic models and hydrological studies through partnership working to improve understanding of the catchment as a whole, and share the information between the RMAs and other stakeholders. The Council will identify any gaps that exist in the datasets and any gaps in understanding of the catchment processes.

Proportionate and risk based approach

A catchment based approach

Measure 6.3: Develop linkages for maintenance programmes between Environment Agency, Milton Keynes Council, Internal Drainage Board and Anglian Water Services.

The RMAs in Milton Keynes all have certain maintenance responsibilities for the watercourses/structures they are responsible for. It is possible that an inefficient maintenance programme between the RMAs could lead to an increased local flood risk (e.g. if gullies have not been cleared). Therefore it has been proposed to align the maintenance programmes through a virtual maintenance working group. This group would be used to establish a communication plan to enable a joined up approach to asset maintenance. The advantages of this would be reduced maintenance costs, as there would be a more efficient and effective management approach.

There is currently a good working relationship between the IDB and Parks Trust with regards to asset maintenance. This relationship has been formalised with a Memorandum of Understanding between the organisations. Other partnership could use this example of joint working, or use a Public Sector Cooperation Agreement.



Measure 6.4: Maintain the identity of Milton Keynes Council with neighbouring local authorities to ensure effective regional management of risk and sharing of mutual benefits

The sources, pathways and receptors of flood risk relevant to Milton Keynes are not all located entirely within the administrative boundary. For example, the River Great Ouse flows into Milton Keynes from neighbouring LLFAs Aylesbury Vale and the southern boundary of South Northamptonshire, and flows downstream into Bedford Borough. In agreement with the relevant LLFA's, Milton Keynes Council can help to reduce flood risk downstream through co-ordinated flood risk management activities.

To ensure a co-ordinated approach, Milton Keynes Council will continue to maintain links with each local authority and regional group in the Upper Great Ouse LLFA group. Although Milton Keynes' large scale flood experience is limited, this will provide the opportunity to review flood management initiatives and lessons learnt from other neighbouring LLFAs.

Community focus and partnership working

A catchment based approach

11 Objective 7:

"Ensure emergency planning is linked to the Council's best understanding of the risks"

Measure 7.1: Maintain links with Local Resilience Forum (LRF)

Local Resilience Forums (LRF) bring together Category 1 and Category 2 responders within a local police area, consisting of risk management authorities, local emergency and health services, and utility and transport organisations. It addresses through planning and risk management, the consequences of any emergency that may occur within their jurisdiction and outlines a coordinated response to flood events. Milton Keynes Council is represented in both the Bedfordshire LRF and the Thames Valley LRF.

Although Milton Keynes was not affected by the extreme flood events in 2007 or 2014, it is import that communication is maintained with LRFs about lessons learnt from flooding events elsewhere in the catchment and flood management initiatives.

Community focus and partnership working

A catchment based approach

Measure 7.2: Ensure the protection of critical infrastructure is considered in wider flood management

During a flood event, it is essential that critical infrastructure, such as hospitals and main roads, within Milton Keynes are protected and kept clear for emergency access. Milton Keynes Council will investigate the different levels of flood risk to critical infrastructure in order to inform emergency plans and enable prioritisation of flood risk protection in Milton Keynes.

Proportionate and risk based approach

Measure 7.3: Ensure findings from ongoing studies and SWMP are communicated with Emergency planning

Milton Keynes Council will formalise an internal flood group to create a more efficient group between officers of different departments, focussing on the LLFA responsibilities, such as flood investigations and emergency planning. This will improve the effective communication between the different internal departments and allow a more joined up approach to flood risk studies in the Borough. The outputs of these studies, along with the SWMP, will be used to inform emergency planning in Milton Keynes.

Community focus and partnership working

A catchment based approach

12 Prioritising actions and funding flood risk management

12.1 Prioritising flood risk measures

It is not possible to prevent all flooding, and with limited resources and funding, flood risk management work will need to be prioritised. Each measure in this Strategy has been split into a number of actions (as outlined in the Action Plan in Appendix C) and these have been prioritised as High, Medium or Low based on current understanding of local flood risk and resources and funding available to address this across Milton Keynes.

As understanding of flood risk improves, Milton Keynes Council will develop specific mitigation schemes and activities to address flood risk in those areas at greatest risk, where required and appropriate. This will require a clear protocol in terms of identifying which actions or schemes should be taken forward given the limited local and national funding streams. In these cases the following will be important considerations:

- Risk the risk of doing nothing in terms of economic, social and environmental impacts;
- **Consequence** how many people or properties the measure or scheme could impact, e.g. an individual property, parish or Milton Keynes as a whole; and
- Deliverability including costs and technical deliverability, e.g. providing information on flood resilience measures via the council website would be cheaper and technically easier to implement than designing and implementing a large flood alleviation scheme.

Moving forward, to ensure funding and resources are targeted to those areas and actions of highest importance the Council will prioritise local flood risk management activities based on the following, where:

- There is a historic and ongoing flood risk from local flooding sources (surface water, groundwater and smaller watercourses and ditches);
- Funding is available;
- There is an identified benefit to properties, communities, businesses and / or infrastructure;
- Funding is made available by partners, where perhaps traditional funding sources are not available or cannot fully fund the cost of the measure;
- The measure delivers benefit and mitigation to areas identified as being at risk through Milton Keynes Council's Local Flood Risk Management Strategy, Strategic Flood Risk Assessment or Preliminary Flood Risk Assessment; and,
- Schemes deliver multiple benefits, including wider environmental benefits.

The prioritisation of schemes and actions will be reviewed annually based on available funding, resources and local priorities.

12.2 Funding flood risk management projects

In the main, flood risk management projects are funded by a combination of the following funding streams:

- National funding Flood and Coastal Erosion Risk Management Grant in Aid (FCRM GiA);
- Regional funding Local Levy; and,
- Local / other funding contributions.

The mechanism for attracting the national (FCRM GiA) and regional (Local Levy) funding gives priority to the protection of residential properties.

12.2.1 Flood and Coastal Erosion Risk Management Grant in Aid (FCRM GiA)

Flood and Coastal Risk Management Grant in Aid (FCRM GiA) is the capital budget set aside by central government for flood defence projects across England. Following consultation during 2011, the Department for the Environment, Food and

Rural Affairs (Defra) introduced a new approach to the funding of flood risk management capital projects. This approach was termed the 'Flood and Coastal Resilience Partnership Funding' approach. The Partnership Funding Approach is governed by the Environment Agency and represents a key source of funding for flood alleviation measures proposed by LLFAs and Internal Drainage Boards.

The key benefits of the new approach are:

- Communities, through their Regional Flood and Coastal Committees (RFCCs), can take decisions on which projects should progress, based on local willingness to contribute towards the benefits that would be delivered;
- The programme of capital works will be prioritised based on the damages being prevented by the project; and,
- A higher proportion of capital projects can be eligible for some government funding, subject to resources being available.

12.2.2 Other Sources of Funding

In order to maximise the benefits of the new approach to funding of flood risk management capital projects, Milton Keynes Council should work closely with partnering organisations and other bodies to attract alternative sources of funding. It is important to note that the likelihood of securing FCRM GiA can significantly increase when other sources of funding are secured.

In taking forward flood risk management activities, the Council will need to consider securing funding from alternative sources, including Central Government, other RMAs and stakeholders and private beneficiaries. One of the council's key aspirations is to maximise multi-beneficial outcomes of new schemes or activities. This could open up more avenues of internal revenue than purely flood risk management, particularly where measures address existing core activities for the Council.

Whilst the process of attracting funding from private sources is still in its infancy, Table 12.1 highlights possible sources of funding that could contribute to the delivery of flood risk management projects or schemes.

Potential Sources of Funding	Description	Administered By:
Local Levy	A levy on local authorities within the boundary of each Regional Flood and Coastal Committee (RFCC). The Local Levy is used to support, with the approval of the committee, flood risk management projects that are not considered to be national priorities and hence do not attract full national funding through the FCRM GiA.	Environment Agency through Anglian RFCC
Private Contributions	Voluntary, but funding from beneficiaries of projects could make contributions from national funding viable. Contributions could be financial or "in kind" e.g. land, volunteer labour.	Milton Keynes Council
Water Company Investment	Investment is heavily regulated by Ofwat but opportunities for contributions to area-wide projects which benefit their customers, for example by addressing sewer under-capacity problems and locating and removing surface water draining to the foul sewer to reduce combined sewer outfall spills.	Anglian Water Services
Community Infrastructure Levy (CIL)	The Community Infrastructure Levy (CIL) allows Local Authorities to raise funds from developers undertaking new building projects within their area of governance. Such funds can be used to mitigate the effects of the development, including flood defences. Currently Milton Keynes Council has no plans to introduce CiL, but this position will be reviewed in the future.	Milton Keynes Council
Section 106 Agreements	Section 106 agreements (Town and Country Planning Act 1990) are a mechanism designed to make a development proposal acceptable in planning terms, through the site specific mitigation of impacts from a development.	Milton Keynes Council
Local Residents / Businesses	Community engagement can be a very effective means of raising awareness of flood risks and management activities in local areas, and promoting a sense of 'helping communities to help themselves' can result in contributions from private sources, such as local residents and businesses.	Milton Keynes Council

Table 12.1: Potential Sources of Funding

Potential Sources of Funding	Description	Administered By:
Funding for Local Flood Risk Management Responsibilities	The Government has committed funding annually to support LLFAs in their 'new' flood management roles up to 2015/16. The funding is provided through 'Area Based Grants', which have been allocated Defra based on the individual flood risk each local authority faces. Beyond this period funding commitments are unclear and there are likely to be pressures on further funding.	Milton Keynes Council
Local Flood Risk Management Partners	Local Flood Risk Management Partners, or Risk Management Authorities, could also be engaged. For example Anglian Water manage much of the drainage system and therefore could be a potential source of funding if a scheme offers mutual benefits.	Milton Keynes Council
Council Tax	A "ring-fenced" provision within the annual council tax for the specific purpose of addressing flood risk management.	Milton Keynes Council
Business Rates Supplements	Agreement from local businesses to raise rates for specified purposes.	Milton Keynes Council
Council Capital Funding	The Councils infrastructure programme prioritising capital improvement projects. The Council programme may include funding for drainage capacity improvements for highway drainage systems, for example, but could include a flood scheme, if benefits can be identified.	Milton Keynes Council
Council Revenue Funding	The Council has a number of revenue streams to support technical and administrative processes and to maintain council infrastructure. Existing revenue budgets include Highway Drainage and Gully Maintenance, and Ordinary Watercourse Maintenance, discharging the Lead Local Flood Authority duty for the Council.	Milton Keynes Council
IDB drainage rate	Drainage rates are charged by the IDB in the Drainage District for the drainage benefit of the district. This enables proactive watercourse maintenance to be undertaken as well as providing advice on development and administering the system with land drainage consenting and adoption of SuDS.	Buckingham and River Ouzel IDB

12.2.3 Maintenance Costs

In the current financial climate, there are significant pressures on the Council budget and funding for maintenance activities. Using the Strategy Action Plan, historic flood evidence and communication with residents, Milton Keynes Council will look to prioritise maintenance for those assets which have the greatest effect on local flood risk and in those areas most at risk to maximise effectiveness of limited funding. At the same time, the Council will seek to maximise income from external sources, including asset owners and riparian owners, for flood risk management as well as encourage riparian owners to adequately maintain their stretches of watercourse.

13 Delivery of Wider Environmental Objectives

13.1 Identification of Environmental Opportunities

The Strategy will complement work that is currently underway to comply with the requirements of the European Water Framework Directive (WFD)⁶⁷. The Directive seeks to improve the management, protection and enhancement of the water environment.

The Anglian River basin district spans from Lincolnshire in the north to Essex in the south and Northamptonshire in the west to the East Anglian Coast. The district comprises small to medium sized towns and cities, there are no extensive metropolitan areas and the district is predominantly rural with the majority of the land surface occupied by agriculture or horticulture⁶⁸. Rural land management is a source of diffuse pollution from nutrients, sediments and pesticides. Sewage treatment works and other intermittent discharges from the sewerage network also increase nutrient levels. Run-off and drainage from urban areas can also contain a range of pollutants whilst physical modification of waterbodies is a key issue within the district. Milton Keynes falls within the Upper Ouse and Bedford Ouse catchment as defined by the Anglian RBMP. The RBMP states that there are 94 river water bodies in the catchment and 5 lakes, in 2009 26% of water bodies were of good ecological status or potential, by 2015 this figure is expected to rise to 29%. Key actions for this catchment include the implementation of eel passage systems, the delivery of a River Ouse Strategic Partnership to develop partnerships and relationships with farmers and land owners and the management of invasive species such as Giant Hogweed. The Environment Agency are currently preparing updates for the RBMPs, which are due to be published in 2016.

Flood risk management activities are expected to have a significant impact on the ability of the UK to comply with the requirements of the WFD, as flood protection can involve substantial alteration to the natural properties of a river. The Anglian River Basin Management Plan encourages the use of sustainable drainage systems (SuDS) as a means of reducing the physical impact of flood risk management works on the ecological status or potential of water bodies.

This Strategy seeks to alleviate local flood risk by encouraging best practice for the maintenance of flood prevention and drainage assets. Whilst flood risk management activities are likely to enhance biodiversity through habitat preservation and/or creation, 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. Where practicable, adverse impacts upon biodiversity should be designed out and opportunities for enhancement capitalised upon.

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 regimes. 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.

Similarly, for cultural heritage assets, flood risk management measures typically act to enhance and protect the historical, natural and built environment yet there is the potential for adverse impacts to arise which may affect heritage assets. Where practicable, opportunities for the protection and enhancement of heritage assets should be capitalised upon and where adverse impacts are envisaged they should be mitigated against.

Other plans and strategies provide mitigation to avoid impacts on designated sites, protected species and habitats 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 in freshwater habitats or there may be cumulative effects on a particular species or type of habitat.

The Anglian RBMP highlights Milton Keynes as a key centre for growth for 2021. New developments should incorporate SuDS at early stages of design and act to not only prevent flooding on site and the surrounding area but to provide an overall betterment to flood risk management within the wider area. Opportunities for the retrofitting of SuDS should also be

⁶⁷ European Union (2000) Water Framework Directive 2000/60/EC, <u>http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT</u> ⁶⁸ Anglian River Basin Management Plan (2009)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/309814/River_Basin_Management_Plan.pdf

considered where resources allow. The inclusion of SuDS is likely to play an important role in contributing to the delivery of the Anglian RBMP and WFD objectives.

When considering flood risk measures and management, receptors such as landscape, soils and geology, material assets and human health (as a function of access for instance) must also be considered alongside the interrelationships between these factors.

13.2 Complimentary Environmental Plans and Strategies

A review of existing environmental plans and strategies has been undertaken in order to identify any potential inconsistencies or constraints between these documents and this Strategy, and to identify opportunities for environmental enhancement. The documents listed below were considered to have a significant bearing on the objectives of the Strategy.

13.2.1 Biodiversity

The Milton Keynes Core Strategy⁶⁹ contains guidance and policies on the importance of the natural environment. Policy CS 19 highlights key environmental protection objectives which should be facilitated to maximise the benefits derived from biodiversity (Section 5.2).

The most recent Buckinghamshire and Milton Keynes Biodiversity Action Plan (BAP)⁷⁰ was published in 2015 by the Buckinghamshire and Milton Keynes Natural Environment Partnership (NEP).

The BAP describes how biodiversity will be protected and enhanced in Buckinghamshire and the Milton Keynes Borough over the next ten years. The BAP is split into 'Habitat Creation Targets' which contribute to the delivery of the UK BAP⁷¹.

The Upper and Bedford Ouse Catchment Partnership will be identifying, and seeking funding for, environmental enhancement projects that may also deliver flood risk reduction benefits. The Milton Keynes Parks Trust is a core member of this Partnership.

13.2.2 Cultural Heritage

The Core Strategy (2013) which will be reviewed and updated by Plan:MK includes a number of policies in regards to the protection and enhancement of the historic environment which mirror the aim of the long-term Spatial Vision for Milton Keynes Council. Similarly the Heritage, Museums and Archives Strategy sets out the vision, plan, programmes and projects which have been identified by stakeholder engagement and public consultation as strategically vital for the future of the Milton Keynes borough inclusive of residents, businesses and visitors⁷².

13.2.3 Human Health

Milton Keynes Council has developed a Health and Wellbeing Board. The board brings together key stakeholders and commissioners of services across the NHS, public health, social care and children's services. The board's main aims are to improve wellbeing, reduce early deaths and tackle major diseases and to reduce health inequalities.

Additionally, the Milton Keynes Core Strategy CS18 relates to healthier and safer communities and mentions the requirement to work with the Council's Emergency Planning department to prevent and respond to emergency situations, inclusive of flood risk management. When the Core Strategy is reviewed and updated by Plan:MK this plan will comprise of similar policies including those related to the provision of social infrastructure and quality of life.

13.2.4 Landscape

Milton Keynes Council has developed a number of policies to protect and enhance the Landscape of the Borough. For instance the Local Plan (2005) includes policies regarding the protection, enhancement and extension of the City's Strategic Green Infrastructure, and aims to prevent inappropriate development arising which may adversely impact upon the landscape and other environmental features.

The Milton Keynes Core Strategy reinforces the aims and objectives of the Local Plan in regards to the extension of green infrastructure across the Borough and states that 'The linear parks will be extended along the Broughton, Caldecotte and

⁶⁹ Milton Keynes Council Core Strategy (2013) <u>http://www.milton-keynes.gov.uk/planning-and-building/planning-policy/core-strategy-2013</u>

⁷⁰ Buckinghamshire and Milton Keynes Natural Environment Partnership (2015) Forward to 2020: Buckinghamshire and Milton Keynes Biodiversity Action Plan http://www.bucksmknep.co.uk/?p=658

⁷¹ UK Biodiversity Action Plan <u>http://jncc.defra.gov.uk/default.aspx?page=5155</u>

⁷² Milton Keynes heritage, Museums and Archives Strategy 2014-2023

Loughton brooks into the city extensions, and along the Ouse and Ouzel valleys to the north. These multi-purpose open spaces will provide extended leisure routes, strategic flood management, improved wildlife habitats and new sports provision, helping provide the population with opportunities for more healthy lifestyles'.

In 2013, Milton Keynes Council developed a Public Open Space Management Framework (2013-2023) which identified the key actions required in order to achieve a high quality, sustainable and viable public open space in the Borough. This framework will identify all public open space, set quality standards and commit to meeting them.

In 2008, The Landscape Partnership developed a Green Infrastructure Plan for Milton Keynes borough which had the aim of 'providing a framework for the development of a strategic network of opens spaces and access links for existing and future residents of Milton Keynes'. Additionally the Plan identified assets which require enhancement to address deficits in provision which will ultimately enhance access to and enjoyment of green spaces across the borough⁷³.

13.2.5 Material Assets

Both the Local Plan and Core Strategy recognise the importance of infrastructure provision. The Core Strategy highlights that one of the key 'drivers of change' is the 'delivery of infrastructure to accommodate growth - major infrastructure (such as roads and schools) should be in place before developments have been completed'. Plan:MK will review, revise and update the relevant policies associated with material assets which are currently held within both the Local Plan and the Core Strategy.

13.2.6 Geology and Soil

Milton Keynes' Local Plan (2005) and Core Strategy included objectives related to the preservation and enhancement of the natural environment inclusive of land, soil and geology. It is expected that Plan:MK will reflect these objectives. Milton Keynes Council is committed to the protection of soil and geological resources and produced the Milton Keynes' Council Contaminated Land Strategy in 2001⁷⁴ which outlines how the Council manages potentially contaminated sites within its administrative boundary. A substantial amount of land remediation projects had already taken place prior to the implementation of the strategy.

13.3 Delivery of Wider Environmental Objectives

The Flood and Water Management Act states that a LFRMS must specify how it will contribute to the achievement of wider environmental objectives. In order to facilitate this requirement, a Strategic Environmental Assessment⁷⁵ (SEA) of the LFRMS has been undertaken in accordance with Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the 'SEA Directive')⁷⁶. The SEA was developed alongside the LFRMS and has been used to inform sustainable decision making throughout.

13.3.1 Strategic Environmental Assessment Background

SEA is an iterative, systematic, publicly accountable framework with an overarching aim of integrating environmental considerations within policy development at the earliest opportunity whilst providing an 'audit trail' of option development and environmental mitigation.

Article 1 of the SEA Directive states that the preparation of an SEA will "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". More simply an SEA is undertaken to identify the significant impacts that plans, programmes and strategies may have on the existing and future environment, and therefore heightens the consideration of environmental issues in decision making processes and planning.

SEA involves the identification and evaluation of potential environmental impacts resulting from the implementation 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. Impacts should not just be considered on a direct basis but should encompass temporary, permanent, positive, negative, secondary, cumulative and synergistic impacts over a range of timescales and probabilities.

 ⁷³ <u>http://www.landscapeinstitute.org/southeast/projects/casestudy.php?id=182</u>
 ⁷⁴ Milton Keynes Contaminated Land Strategy (2001). <u>http://www.milton-keynes.gov.uk/environmental-health-and-trading-standards/pollution/contaminated-</u>

land AECOM (2014) Draft Strategic Environmental Assessment

⁷⁶ SEA Directive (2001) http://ec.europa.eu/environment/eia/sea-legalcontext.htm

The application of the SEA process to flood management plans and programmes is not legally required in every case, however adopting the SEA approach is strongly encouraged by Defra to enable a strategic approach to managing flood risk.

The SEA process ensures that environmental considerations inform the development of objectives and measures of the LFRMS, whilst mitigating against adverse environmental impacts and highlighting areas of environmental and socioeconomic opportunity. Additionally the SEA process identifies how the LFRMS can contribute to the achievement of wider environmental objectives, including WFD objectives.

13.3.2 Strategic Environmental Assessment Approach

The Communities and Local Government's Guidance on the development of an SEA⁷⁷ identifies five key stages which are intended to be valid for all plans and programmes to which the Directive implies, irrespective of their geographical scope. Stage A *Scoping and Baseline* was conducted during the LFRMS/FRMP SEA Scoping stage whereas stage B *Developing and Refining Alternatives and Assessing Effects* is covered in the *Preparation of an SEA Environmental Report* (Stage C). Stage D relates to *Consultation* of both the Draft LFRMS and Environmental Report. Stage E *Implementation and Monitoring* will occur over the lifetime of the LFRMS in order to ensure continual improvement and the delivery of effective flood risk management alongside wider environmental objectives.

13.3.3 SEA Outcomes

The SEA has shown that Milton Keynes' LFRMS is likely to have beneficial impacts upon the environment in both the short and long term (beyond the life of the strategy). This is due to the proactive, holistic, sustainable approach of the Strategy which has the primary aim of outlining the approach Milton Keynes Council as LLFA will take to manage local flood risk in both the short term and long term, with proposals for actions that will help to manage the risk in a way that delivers the greatest benefit to its residents, business and the environment. Each of the Strategy objectives is predicted to fulfil the environmental objectives identified within the SEA framework with a beneficial outcome either directly or indirectly (or neutral relationships).

The majority of the Strategy objectives are likely to have indirect beneficial impacts upon the environment as they relate to strategic sustainable flood risk management measures rather than individual actions which would potentially have a larger effect 'on the ground'.

The benefits of implementing the Strategy are perhaps best demonstrated by the 'do nothing' alternative assessment which demonstrates the adverse impacts upon the environment through the failure to implement the Strategy. In the short term this would leave local communities, assets and infrastructure at an increased risk of flooding. It is likely that this risk would heighten over time as a result of climate change and associated impacts upon flood frequency and magnitude.

The assessment of cumulative impacts acknowledges that there is a potential for adverse impacts to arise as a result of the cumulative effect of multiple plans and programmes. However, the SEA predicts that a number of beneficial, cumulative impacts are likely to arise from the implementation of the LFRMS alongside other plans and programmes.

As a result of these findings the SEA does not put recommendations forward for the improvement of the Strategy. Similarly, as the SEA has determined no adverse impacts will result from the implementation of the Strategy, no mitigation measures have been put forward at this stage.

13.3.4 Habitats Regulations Assessment (HRA)

Article 6(3) of the EC Habitats Directive (1992)⁷⁸ states that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a **significant effect** thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".

Similarly, Regulation 48 of the Conservation (Natural Habitats &c) Regulations (1994)⁷⁹ states that:

⁷⁷ CGL Guidance on SEA <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf</u>

⁷⁸ Habitats Directive (1992) <u>http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043</u>

⁷⁹ The Conservation (Natural Habitats, &c.) Regulations (1994) <u>http://www.legislation.gov.uk/uksi/1994/2716/regulation/48/made</u>

"A competent authority, before deciding to undertake, or give any consent, permission or other authorization for, a plan or project which... is likely to have a **significant effect** on a European site in great Britain.. shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives".

Milton Keynes Council's administrative area does not contain any European sites on nature conservation. Similarly, the LFRMS is a high level strategic document which does not contain any measures or actions which have the potential to cause significant effects upon such sites. Additionally, the SEA found that the LFRMS objectives are likely to have neutral or minor, indirect beneficial impacts upon biodiversity and therefore **significant effects** are very unlikely to materialise. The HRA screening report is included in Appendix D.

13.3.5 Water Framework Directive (WFD)

The LFRMS will complement work that is currently underway to comply with the requirements of the European WFD (2000/60/EC). Although a formal WFD assessment (WFDa) is not a statutory requirement of the LFRMS, WFD requirements have been considered as part of the SEA process, including where opportunities to improve WFD status exist.

The Environment Agency is responsible for preparing management plans for river basin districts in England and Wales in line with the requirements of the WFD. The Anglian RBMP is concerned with the pressures faced by the water environment in the Anglian River Basin District and the actions that will address them. In recent years there has been considerable progress made in protecting the natural assets of the river basin district and in resolving the challenges imposed upon the water environment. However, a number of challenges remain and these include:

- Point source and diffuse pollution from sewage treatment works and agriculture/other sources respectively;
- The physical modification of water bodies; and,
- Water abstraction.

Under the WFD, surface water bodies are classified on the basis of chemical and ecological status or potential. 'Ecological status' is assigned to surface water bodies that are natural and considered by the Environment Agency not to have been significantly modified for anthropogenic purposes.

'Ecological potential' is assigned to artificial water bodies (such as canals), or natural water bodies which, as a result of physical alterations by human activity, are substantially changed in character. They are termed Heavily Modified Water Bodies (HMWB). The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection.

Flood risk management activities are expected to have a significant impact on the ability of the UK to comply with the requirements of the WFD, as flood protection can involve substantial alteration to the natural morphology and function of waterbodies.

Table 13.1 demonstrates the current status of rivers in the Milton Keynes Council administrative boundary which have undergone classification under the WFD and have subsequently been assigned a WFD Status.

Water- body Name	Hydro- morphological Designation	Current Ecological Status	Current Chemical Quality	2015 Predicted Ecological Quality*	2015 Predicted Chemical Quality	Overall Risk
The Great Ouse	Heavily Modified	Moderate Potential	Good	Moderate Potential	Good	At Risk
The River Ouzel	Heavily Modified	Moderate Potential	Good	Moderate Potential	Good	At Risk
Broughton Brook	Heavily Modified ⁸⁰	Good Potential	Does not require Assessment	Good Potential	Does not require Assessment	At Risk
Chicheley Brook	Not Designated an Artificial or Heavily Modified	Moderate	Good	Good (By 2027)	High	-
The River Tove	Heavily Modified	Moderate Potential	Good	Moderate Potential	Good	At Risk
Loughton Brook	Heavily Modified	Moderate Potential	Does not require Assessment	Moderate Potential	Does not require Assessment	At Risk

Table 13-1: Milton Keynes Council Main Rivers WFD Status

* likely to be updated when the RBMP is published in 2016

The LFRMS seeks to reduce the incidence of local flooding through: encouraging future development to provide betterment to local flood risk; pursuing flood risk management measures using a risk based approach that provides multiple social, economic and environmental benefits and managing coastal flooding and erosion to hold the current line of defences and maintain the standard of protection.

The LFRMS will facilitate 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 the strategic management of local flood risk, as enabling natural flood patterns to continue or extend in some areas can improve wetland habitats. The indirect, minor, yet beneficial impacts of the LFRMS upon biodiversity are described thoroughly within the Environmental Report.

In assessing this LFRMS for WFD compliance, the measures proposed are unlikely to have any significant environmental effects and will not cause deterioration to water bodies. However, as projects and schemes are developed these may require site specific environmental assessments to identify any potential environmental effects which may arise.

⁸⁰ Broughton Brook's hydromorphological designation in the first RBMP was Artificial, but this will be changed to Heavily Modified in the second RBMP

14.1 How will the Strategy be implemented?

The Strategy is based on the latest information available at the time of its preparation. It will be updated, in consultation with other organisations and individuals in managing flood risk, and should be considered a 'live' document which will evolve over time as new information becomes available and flood events occur.

Milton Keynes Council will work in partnership with stakeholders, including local communities and businesses, to deliver the objectives of this Strategy. Through continuing to work with partners to build relationships and deliver the actions identified, the Council will ensure that measures promoted achieve social, economic and environmental benefits for the community, and seek to meet future climate conditions.

The Strategy will provide the framework for the Council's delivery of its flood risk management responsibilities. It will be formally approved by the Council's cabinet and adopted as a Council Strategy. It is a 'living document' that will develop as new information, expertise and resources influence the delivery of the actions outlined in the Strategy.

14.2 How will the Strategy be monitored?

It is proposed that Milton Keynes Council will monitor progress against the Strategy Action Plan annually or following a significant flooding incident. This will involve assessing which actions have been delivered, and determining whether there has been any change to the prioritisation of actions, in line with current flood risk management priorities and funding availability. Findings from this monitoring process will be reported in an annual Monitoring Report, which will be published on the Milton Keynes Council website and presented to Elected Members.

14.3 How will the Strategy be reviewed?

The Strategy has been developed to deliver a short to medium (5-year) improvement plan to establish a sound evidence and knowledge base upon which to develop a longer-term investment plan for local flood risk management activities in Milton Keynes.

It is proposed that a full update of the Strategy should be scheduled for 2020, and thereafter every five years (as a minimum) to coincide with the Transport Asset Management Plan update.

However, the Strategy and the supporting Action Plan will remain live documents over the Strategy period, and may require review more regularly to recognise potential events or specific changes, such as:

- Occurrence of a significant and widespread surface water flood event;
- Significant changes to datasets or information which may alter the understanding of risk within Milton Keynes (such as the locations of critical infrastructure);
- Significant amendments to the legal responsibilities and/or roles and functions of Risk Management Authorities and/or other organisations;
- Annual Monitoring identifies that the Strategy is not achieving its objectives;
- Changes to relevant national and European legislation; or,
- Change in funding availability which has a significant effect on the Strategy Action Plan.

14.4 How was the Strategy consulted on?

A consultation exercise was undertaken with parish councils and ward members in early 2015 to inform the development of the Strategy. The draft Strategy under went public consultation in the summer of 2015 for a period of three months, offering the opportunity for residents, businesses and risk management stakeholders to provide feedback. Following the consultation, Milton Keynes Council reviewed all the comments and recommendations and updated the Strategy. The Strategy and associated documents will be published on the Milton Keynes Council website following formal adoption.

Appendix A. Figures

- A.1 Waterbodies and Watercourses
- A.2 Critical Infrastructure and Surface Water
- A.3 Updated Flood Map for Surface Water
- A.4 Areas Susceptible to Groundwater Flooding
- A.5 Fluvial Flood Zones
- A.6 Historic Flooding
- A.7 Critical Drainage Catchments

















Appendix B.Survey Results

B.1 Purpose, Methodology and Response

Purpose

Milton Keynes Council wished to engage with the local community at an early stage in developing its Local Flood Risk Management Strategy ('the Strategy') to gather information on local flooding incidents, flood preparedness, perceptions of flooding and local priorities for local flood risk management. The information collated through this exercise has been used to provide an evidence base to inform the Strategy.

Engagement Approach

A survey was developed to gather views and evidence, which was available online between 6th November 2014 and 31st March 2015.

Questions included in the survey covered 4 broad areas:

- Current understanding of flooding in Milton Keynes,
- Communication of flood risk information,
- Priorities for flood risk management; and,
- Funding for flood risk management.

Milton Keynes Council emailed the survey to local ward Councillors and Parish Councils within Milton Keynes.

Response Rate

In total the Council received 41 completed surveys, with respondents from the following organisations/wards/ parishes:

- Newport Pagnell Town Council
- Lathbury Parish Meeting
- Bletchley & Fenny Stratford Town Council
- Great Linford Parish Council
- Central M.K.Bradwell Parish
- Great Linford parish
- Campbell Park
- M.K. City Parish
- Emberton Parish Council
- Castlethorpe Parish Council, Milton Keynes
- Shenley Brook end and Tattenhoe
- Shenley Church End & Tottenhoe Parish Council
- Monkston
- Castlethorpe
- Redhouse Park
- Great Linford Parish Council
- Walton Community Council
- Lavendon Parish
- Kents Hill and Monkston Parish Council
- Emberton Parish Council
- Clifton Reynes and Newton Blossomville Joint Parish Council

- Olney Ward
- Shenley Brook End & Tattenhoe Parish Council
- Stoke Goldington Parish Council
- Stony Stratford
- Stony Stratford Town Council
- Calverton resident's association (and Calverton Parish Meeting)
- Ravenstone Parish Council
- Ward councillors, Monkston ward
- Campbell Park Parish Council
- Stantonbury Parish Council
- Bletchley and Fenny Stratford Town Council
- Bletchley Park
- Stony Stratford Town Council
- Monkston Ward, Lib Dem cllr
- Stony Stratford
- Milton Keynes Council

General Caveats

The results of this engagement are not statistically representative of the views of Milton Keynes residents due to the nature of the methodology used. The level of response, information gathered and views obtained provide a useful indicator of wider opinion and any important issues that will need to be considered.

Percentages used in this analysis have been rounded and may not add up to exactly 100%. For some survey questions, respondents could select more than one response which also means that percentages, if added together, can total more than 100%.

B.2 Current understanding of flood risk in Milton Keynes

Respondents were asked to identify what they thought were the main sources of flooding in their local areas. Figure B-2 illustrates the perceived greatest sources of flooding in Milton Keynes.



Figure B-2 Sources of local flooding identified by survey respondents

Responses from the public survey indicate that respondents are not concerned about one single source of flooding, but instead a number of different sources were identified as sources of flooding in the local area. Blocked or overflowing road drains, runoff from fields and adjacent land and smaller ditches and streams were identified as sources of flooding by a significant percentage of respondents.

Historic flood records for Milton Keynes suggest that flooding from surface water and ordinary watercourses are the most prevalent sources of flooding throughout the Borough. This is reflected in the survey, with runoff from fields, small streams and blocked road gullies identified by a large percentage of respondents as sources of flooding. However the survey results indicate that there are a number of other identified sources of flooding.

B.3 Communication of flood risk information

A key outcome from the survey was that respondents would like to receive more information on a number of topics, for example the existing local flood risk, how this is being managed and how to better protect themselves and their property from flooding. Figure B-3 illustrates the key topics which respondents would like to receive greater information on.



Figure B-3 Key topics on which respondents would like to receive further information

Respondents were asked to indicate how they would like to receive information about flood risk management in Milton Keynes. The preferred methods of communication were;

Method	Number of respondents	% of respondents
Milton Keynes Council Website	28	68%
Information and articles in local newspapers	19	46%
Leaflets / letters through door	15	37%
Social media - Twitter, Facebook etc	14	34%

The majority of respondents that chose 'Other' have suggested that information about flood risk management is received via an email mailing list or through their Parish Council.
B.4 Priorities for Flood Risk Management

Respondents were asked to indicate how concerned they were about different consequences of flooding, ranging from not at all concerned to very concerned. Figure B-4 illustrates that respondents are most concerned about new development and maintenance of highway drainage, as well as the maintenance of watercourses. Of the respondents, 72% are somewhat concerned about climate change and increasing rainfall in the future.





Keeping people safe and protecting life is always the priority for flood management. Beyond this respondents were asked to identify what the priority for flood risk management within the Borough should be. The top three flood risk management priorities for residents and businesses in Milton Keynes were identified to be:

Priority	Number of respondents	% of respondents
Changes to flood management policy for new development	28	68%
Increased maintenance of watercourses and road drains	19	46%
Improving protection of critical infrastructure, such as electricity substations	15	37%

B.5 Funding for Flood Risk Management

The Department for Environment, Flood and Rural Affairs (Defra) is the main source of funding for flood prevention measures. The funding available is normally divided across projects nationwide on a cost / benefit basis. This means that where local businesses and communities are to benefit from flood prevention measures, additional monetary contributions from those who benefit, can greatly improve the likelihood of a project receiving funding.

Respondents were asked to what extent they agreed or disagreed that different organisations should contribute financially to flood alleviation schemes. Figure B-5 indicates that respondents believe the greatest responsibility with regards to flood management funding lies with central government, as well as the property developers, water companies and the Environment Agency.



B-5 Respondent support for funding source options

B.6 How has the survey feedback influenced the Strategy?

- Respondents to the survey indicated that they would like to receive more information on the flood risk in their local area, what watercourse maintenance has occurred in their local area and who is responsible for the different types of flooding. In order to educate people about the sources of flooding across Milton Keynes borough, the Council is committed to publishing more information on local flood risk and what residents, businesses and communities can do to better prepare themselves for flooding.
- Milton Keynes Council is committed to increasing understanding of local flood risk and prioritising flood risk management work in areas of highest flood risk to maximise the effectiveness of available funding.
- Respondents showed concern about the effect of new development on flooding. An objective of the Milton Keynes Strategy is to ensure future development does not have a negative impact on flood risk and lowers the risk where possible. To meet this objective, the Council will review their planning policy and guidance in relation to flood risk, investigate ways to manage urban creep and improve understanding of how the provision of SuDS will lower the risk of flooding.
- The council has taken on board respondents concerns regarding highway drainage through establishing measures to protect the effective maintenance of the current drainage system in the Milton Keynes borough and to develop linkages between maintenance programmes for the RMAs.

Appendix C. Action Plan

This Action Plan supports the Milton Keynes Local Flood Risk Management Strategy Final Report - February 2016. The reader should refer to the Main Strategy document for information relating to the local flood risk, objectives, measures and potential funding streams.

Measure /	Information relating to the measure or scheme for each action
Scheme	
Delivery	Proposed lead and partners for delivery of the action
Programme	Proposed start, finish and review timescales for the action, along with its current status
Funding	Estimated cost, source of funding and information on funding allocation
Priority	Identification of priority for actions
Comments	Any additional information relating to the action including links to case studies or articles where these have ben published.

Item		Description					
Measure /	ID The invidividual measure ID. This is automatically generated when a new action is added.						
Scheme	Objective	Dijective, as defined in the LFRMS.					
	Measure	Measure to deliver the objective, as identified in the LFRMS.					
	Action	Individual action to deliver the measure.					
Delivery	Lead	Organisation who will lead the measure or scheme.					
	Partners	Organisations who will be supporting or have a key role to play in delivering the measure or scheme.					
Programme	Start	Start date (financial year) for the measure or scheme.					
	Finish	Proposed finish date (financial year) for the measure or scheme.					
	Review	Review date for the measure or scheme. These are quarterly so stated at Month - Year.					
	Status	Status of the measure or scheme: Not Started, In Progress, Planning, Community Engagement, Investigation, Feasibility, Design, Implementation or Completed.					
Funding	Est. Cost (£)	Estimated cost of the measure or scheme.					
	Source	Identified source of funding for delivering the measure or scheme.					
	Status	Funding status of the scheme: Secured, Allocated, Requested, To be Confirmed or Unsuccessful.					
Priority		Priority assigned to the indivdual action. Low, Medium or High or 1-10. Criteria / justification to be agreed with					
		boroughs.					
Comments		Any additional comments of information on the measure, action or scheme.					



Version: Revision Date: Next Review Date:

1.2 12 February 2016 12 August 2016

							Delivery		Progra	Imme			Funding		Priority	Comments
Ob	jective	Меа	isure	Actio	ns	Lead	Partners	Start F	Finish	Review	Status	Est. Cost (£)	Source	Status		
1	Ensure that drainage management is tailored	1.1	Improve our understanding of the drainage capacity in Milton Keynes	1.1.1	Secure funding to update the Milton Keynes Drainage Study produced in 2000	MKC - Planning Team	EA, IDB, AWS, Parks Trust	2015-2016	2015-2016	Apr-16	In Progress	Less than £5,000	Internal (Other)	Allocated	High	1
	to Milton Keynes unique		and its resilience to development.	1.1.2	Identify data gaps relating to existing drainage capacity	MKC - Planning Team	AWS, IDB	2015-2016	2015-2016	Apr-16	Not Started	Less than £5 000	FDGiA	Allocated	Moderate	
	aramage eyetem			1.1.3	Undertake drainage capacity assessment of the existing system	MKC - Planning	AWS, IDB	2016-2017	2016-2017	Sep-16	Not Started	£25000 +	FDGiA	Allocated	Moderate	
				1.1.4	Carry out modelling of different size events to improve	MKC - Planning	AWS, IDB	2016-2017	2018-2019	Jun-16	Not Started	£5000-£25000	FDGiA	Allocated	Moderate	
				1.1.5	Using the modelling outcomes, update the Milton Keynes Drainage	MKC - Planning	AWS, IDB	2016-2017	2018-2019	Jun-16	Not Started	£5000-£25000	FDGiA	Allocated	Moderate	
		1.2	Protect the effective maintenance of	1.2.1	Produce an overview of all RMA's maintenance programmes	MKC - Highways	EA, IDB, AWS, Parks	2015-2016	2016-2017	Sep-16	Not Started	Less than	Internal (Maintenance)	To be	Moderate	
			Milton Keynes for resilience to future	1.2.2	Identify implications of reduced maintenance	МКС	EA, IDB, AWS, Parks	2016-2017	2016-2017	Sep-16	Not Started	Less than	Internal (Maintenance)	To be confirmed	Moderate	
		1.3	Ensure drainage infrastructure for	1.3.1	Review existing and emerging policy with regards to drainage	МКС	AWS	2015-2016	2015-2016	Apr-16	Not Started	Less than	Internal (Other)	To be	Moderate	
			new development is future proofed for its design life.		infrastructure for new developments							£5,000		confirmed		<u></u>
2	Improve the Council's understanding of flood	2.1	Improve the Council's understanding of surface water flood risk in the	2.1.1	Produce Surface Water Management Plan	MKC - Planning Team	EA, IDB, AWS	2015-2016	2015-2016	Apr-16	In Progress	£5000-£25000	Internal (Other)	Secured	High	
	risk from all sources		Milton Keynes Borough	2.1.2	Investigate priority Critical Drainage Catchments (CDCs)	MKC - Planning Team/Highways	EA, IDB, AWS	2016-2017	2015-2016	Sep-16	Not Started	£5000-£25000	To be confirmed	To be confirmed	Moderate	
		2.2	Improve the Council's understanding of Groundwater flood risk in the	2.2.1	Review BGS Susceptibility to Groundwater flood map and identify areas at high risk of flooding	MKC - Planning Team		2016-2017	2016-2017	Apr-16	Not Started	Less than £5.000	To be confirmed	To be confirmed	Moderate	
			Milton Keynes Borough	2.2.2	Improve awareness of what constitutes and causes ground water flooding with in house training and knowledge sharing	MKC		2016-2017	2016-2017	Sep-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	Low	
		2.3	Improve the Council's understanding	2.3.1	Identify ordinary watercourses under LLFA responsibility located	MKC - Planning Team/Highways	EA, IDB, AWS	2016-2017	2016-2017	Sep-16	Not Started	Less than	To be confirmed	To be	Moderate	
			the Milton Keynes Borough		known flooding problems	r cam/r ngnways						20,000		commed		
				2.3.2	Progress modelling of key ordinary watercourses identified in 2.3.1	MKC - Planning Team/Highways	EA, IDB, AWS	2016-2017	2020-2021	Apr-16	Not Started	£25000 +	To be confirmed	To be confirmed	Low	
		2.4	Develop a proceedure for flood	2.4.1	Establish a central database of flood records with an agreed format between BMAs so that records can be imported, exported and	МКС	EA, IDB, AWS, Parks Trust	2015-2016	2015-2016	Apr-16	Not Started	Less than £5 000	To be confirmed	To be confirmed	High	
				242	Viewed easily	MKC		2015-2016	2016-2017	Apr-16	Not Startod	Loss than	To be confirmed	To bo	Modorato	
				2.4.2	regular basis	MKC		2015-2010	0015 0010	Apr-10	Not Started	£5,000	To be confirmed	confirmed	Mederate	
				2.4.3	centre			2015-2016	2015-2016	Apr-16		£5,000		confirmed	Moderale	
				2.4.4	Investigate web-based tools for capturing flood reports and/or photos	MKC		2016-2017	2018-2019	Sep-16	Not Started	Less than £5,000	To be confirmed	confirmed	Low	
				2.4.5	Formalise Parish council's role in community awareness of recording flood events	МКС		2016-2017	2016-2017	Sep-16	Not Started	Less than £5,000	To be confirmed	l o be confirmed	Low	
				2.4.6	Extract records from highways maintenance system and import into flood records database	MKC - Highways		2015-2016	2016-2017	Apr-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
				2.4.7	Create a policy and procedure for determining threshold for a Section 19 investigation, following the FWM Act	MKC - Planning Team/Highways		2015-2016	2015-2016	Apr-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	High	
3	Ensure future development does not	3.1	Review MKC planning policy and guidance in relation to flood risk	3.1.1	Update the Milton Keynes Drainage Strategy SPG (2004) to include latest policies, guidance, information and case studies	MKC - Planning Team		2015-2016	2015-2016	Apr-16	Not Started	£5000-£25000	To be confirmed	To be confirmed	High	
	have a negative impact on flood risk and lowers			3.1.2	Ensure planning policies include designation powers, consenting powers and byelaws	MKC - Planning Team		2016-2017	2016-2017	Sep-16	Not Started	Less than £5 000	To be confirmed	To be confirmed	Moderate	
	the risk where possible.			3.1.3	Ensure that planning policy addresses Sustainable Drainage	MKC - Planning		2015-2016	2016-2017	Apr-16	Not Started	Less than	To be confirmed	To be	Moderate	
				3.1.4	Investigate development of an MoU with neighbouring LPAs so that	MKC		2016-2017	2016-2017	Sep-16	Not Started	Less than	To be confirmed	To be	Low	
		2.0	Ensure MKC is able to continuelly	0.04	may impact on the drainage of MK.	MKC Disperie		0015 0010	0015 0010	A mu d C		£3,000	To be confirmed	Taba	Link	
		3.2	fulfil its duty in relation to the SuDS	3.2.1	Ensure resources are available to enforce the SUDS policy	Team		2015-2016	2015-2016	Apr-16		1		confirmed	High	
			policy changes in April 2015	3.2.2		Team		2015-2016	2016-2017	Sep-16	nn Progress	Less than £5,000	to be confirmed	confirmed	High	
				3.2.3	Develop a local SuDS guidance document for developers, building on the SPG, including examples of small-scale schemes	MKC - Planning Team		2015-2016	2015-2016	Apr-16	In Progress	£5000-£25000	I o be confirmed	To be confirmed	Moderate	ļ
				3.2.4	Run training for Planning officers on SuDS requirements and	MKC - Planning		2015-2016	2015-2016	Apr-16	In Progress	Less than	To be confirmed	To be	High	
		3.3	Investigate ways to manage urban	3.3.1	Consider including caveats within planning policy about paving	MKC - Planning		2016-2017	2016-2017	Sep-16	Not Started	£5,000 Less than	To be confirmed	To be	Moderate	
	1		creep		driveways.	Team						£5,000		confirmed		





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						D	Delivery		Progra	mme		Funding		Priority	Comments
Obj	ective	Mea	sure	Actio	ns	Lead	Partners	Start	Finish	Review	Status	Est. Cost (£) Source	Status		
		3.4	Improve the Council's understanding of how the provision of SuDs will lower the risk of flooding	3.4.1	Develop site-specific case studies to model influence of SuDS in flood prone areas in MK and improve understanding of maintenance	MKC - Planning Team		2017-2018	2017-2018	Mar-17	Not Started	£5000-£25000 To be confirmed	To be confirmed	Moderate	
				3.4.2	Use regional partnerships to share new findings and best practice	MKC - Planning Team		2015-2016	2021 onwards	Apr-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Low	
4	Make best use of resources for maximum	4.1	Investigate where new technologies can help lower risk	4.1.1	Consider purchasing new tools for localised forecasts of extreme weather and flooding	MKC - Highways		2016-2017	2021 onwards	Sep-16	Not Started	To be confirmed	To be confirmed	Low	
	protection from flooding			4.1.2	Install flood gates and telemetry in Little Linford Lane	MKC - Highways		2015-2016	2015-2016	Apr-16	In Progress	£60,000 Internal (Other)	Requested	Moderate	
				4.1.3	Consider the options for installing telemetry on other sections of the road network.	MKC - Highways		2016-2017	2016-2017	Sep-16	Not Started	To be confirmed	To be confirmed	Moderate	
		4.2	Monitor external sources of funding for ongoing flood risk management	4.2.1	Collate and document potential funding routes, internal and external, including application requirements and timeframes	МКС		2015-2016	2015-2016	Apr-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				4.2.2	Monitor and review funding opportunities, both internal and external, for local flood risk management activities on a 6 monthly basis	МКС		2015-2016	2021 onwards	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
		4.3	Understand how the Council can work more effectively with landowners	4.3.1	Target landowner engagement to specific areas at risk of flooding	МКС		2015-2016	2021 onwards	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				4.3.2	Meet with landowner representatives to understand their priorities and communicate those of MKC	МКС		2015-2016	2021 onwards	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				4.3.3	Link up with existing catchment based approach through the Environment Agency to work on initiatives to reduce flood risk (e.g. Catchment Sensitive Farming, WFD schemes)	МКС	EA	2016-2017	2017-2018	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Low	
5	Improve public awareness of flooding	5.1	Development of new communication tools	5.1.1	Develop Milton Keynes flood information webpage on Council website (including how to report a flood incident)	MKC		2015-2016	2021 onwards	Mar-16	In Progress	Less than To be confirmed £5,000	To be confirmed	High	
	and help communities to become more resilient to flooding			5.1.2	Use Live MK magazine, Parish newsletters and local newspapers to disseminate latest Milton Keynes flood alleviation measures	МКС		2016-2017	2021 onwards	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.1.3	Develop tools or communication paths by which local residents can inform the council of flood problems in their local area and register evidence such as photos	МКС		2016-2017	2021 onwards	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
		5.2	Improve education about managed flooding in the public realm	5.2.1	Public information signs for linear parks and balancing ponds to explain their role in flood management, alongside water safety signs	МКС	Parks Trust	2015-2016	2021 onwards	Mar-16	In Progress	Less than To be confirmed £5,000	To be confirmed	Low	
				5.2.2	Use MKC website to provide information to the public on managed flooding in MK	МКС		2015-2016	2015-2016	Mar-16	In Progress	Less than To be confirmed £5,000	To be confirmed	Low	
		5.3	5.3 Encourage community awareness and community level flood resilience through local actions.	5.3.1	Provide information to community groups and resident associations on how they can develop a community flood plan and set up a flood group or flood warden service.	МКС		2015-2016	2015-2016	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.3.2	Regularly review and maintain MKC webpages to include latest flood risk studies	МКС		2015-2016	2015-2016	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	High	
		5.4	Improve awareness of individuals influence on flood risk	5.4.1	Advertise the AWS Keep it clear campaign	МКС	AWS	2016-2017	2016-2017	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.4.2	Disseminate information on website and local newspapers on property level protection	МКС		2016-2017	2016-2017	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.4.3	Contact Riparian Owners to inform them of their rights and responsibilities	МКС	EA	2015-2016	2016-2017	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Low	
				5.4.4	Update MKC website to include information on Riparian Owners rights and responsibilities	МКС		2015-2016	2015-2016	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	High	
				5.4.5	Engage with riparian owners of higher risk watercourses to agree maintenance activities and frequency and highlight the benefits	МКС	EA	2015-2016	2016-2017	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.4.6	Use Parish councils to disseminate flood awareness information, including an individual's actions impacts flood risk, e.g. fly tipping blocking a drain.	МКС		2016-2017	2016-2017	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
				5.4.7	Incorporate drainage issues and information into the Highways roadshow	МКС		2015-2016	2016-2017	Mar-16	Not Started	To be confirmed	To be confirmed	Moderate	
6	Improve communications	6.1	Clarify asset ownership and/or maintenance responsibility where it is	6.1.1	Identify Riparian Owners within Milton Keynes	MKC	EA, IDB, AWS	2015-2016	2021 onwards	Jun-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
	between asset owners and build on existing		not clearly established	6.1.2	Develop partnership relations with AWS to establish asset ownership	МКС	AWS, IDB	2015-2016	2015-2016	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	High	
	partnership working.			6.1.3	Create an asset register	MKC - Highways		2015-2016	2015-2016	Mar-16	In Progress	£5,000- Defra LLFA £25,000	Secured	High	
				6.1.4	Maintain the asset register	MKC - Highways		2016-2017	2021 onwards	Sep-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Moderate	
		6.2	Build on the Council's knowledge about hydrological linkages in the	6.2.1	Collate existing modelling and hydrological studies	MKC	EA, IDB, AWS	2015-2016	2017-2018	Mar-16	Not Started	Less than To be confirmed £5,000	To be confirmed	Low	





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					D	elivery		Progra	amme			Funding		Priority	Comments
Objective	Me	asure	Actio	ns	Lead	Partners	Start	Finish	Review	Status	Est. Cost (£)	Source	Status		
		catchment	6.2.2	Identify gaps in understanding and datasets	МКС		2016-2017	2017-2018	Sep-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	Low	
	6.3	Develop linkages for maintenance programmes between Environment	6.3.1	Establish a virtual maintenance working group	МКС	EA, IDB, AWS, Parks Trust	2015-2016	2015-2016	Mar-16	6 Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
		Agency, Milton Keynes Council, Internal Drainage Board and Anglian	6.3.2	Establish a communication plan to enable a joined up approach to undertaking asset maintenance	МКС	EA, IDB, AWS, Parks Trust	2015-2016	2015-2016	Mar-16	6 Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
		Water Services.	6.3.3	Maintain MoU between IDB and Parks Trust for asset maintenance	IDB	Parks Trust	2015-2016	2021 onwards	Mar-16	6 In Progress	Less than £5,000	To be confirmed	To be confirmed	Low	
			6.3.4	Consider setting up Public Sector Agreement (PSA) for maintenance	MKC	EA, IDB	2016-2017	2017-2018	Sep-16	6 Not Started	Less than £5,000	To be confirmed	To be confirmed	Low	
	6.4	Maintain the identity of MKC with neighbouring local authorities to	6.4.1	Establish a key point of contact with each local authority and regional group	IMKC		2015-2016	2016-2017	Mar-16	6 Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
		ensure effective regional management of risk and sharing of mutual benefits	6.4.2	Maintain links with the Upper Great Ouse LLFA group	МКС		2015-2016	2021 onwards	Mar-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
7 Ensure emergency planning is linked to our best understanding of	7.1	Maintain links with Local Resilience Forum (LRF)	7.1.1	Maintain communication with LRF about lessons learnt from flooding events elsewhere and flood management initiatives	MKC - Emergency Planning Team		2015-2016	2016-2017	Mar-16	6 In Progress	Less than £5,000	To be confirmed	To be confirmed	Moderate	
the risks			7.1.2	Maintain membership of adverse weather subgroups for Bedfordshire LRF and Thames Valley LRF	MKC - Emergency Planning Team		2015-2016	2021 onwards	Mar-16	6 In Progress	Less than £5,000	To be confirmed	To be confirmed	Moderate	
	7.2	Ensure the protection of critical infrastructure is considered in wider	7.2.1	Understand and collate a list of critical infrastructure in Milton Keynes	MKC - Planning Team		2015-2016	2015-2016	Mar-16	6 In Progress	Less than £5,000	To be confirmed	To be confirmed	Moderate	
		flood management	7.2.2	Understand the different levels of risk to critcal infrastructure - create categories or banding	MKC - Planning Team		2016-2017	2016-2017	Sep-16	6 Not Started		To be confirmed	To be confirmed	Moderate	
			7.2.3	Create a GIS layer for Critical Infrastructure using the risk banding identified	MKC - Planning Team		2017-2018	2017-2018	Mar-1	7 Not Started		To be confirmed	To be confirmed	Low	
	7.3	Ensure findings from ongoing studies and SWMP is communicated with Emergency planning	7.3.1	Review internal flood groups to create a more efficient group between officers of different departments with a focus on re- establishing LLFA responsibilities	MKC		2015-2016	2016-2017	Mar-16	6 Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	
			7.3.2	Once set up, Flood group to meet regularly to discuss ongoing flood risk studies and SWMP outcomes	МКС		2015-2016	2016-2017	Mar-16	Not Started	Less than £5,000	To be confirmed	To be confirmed	Moderate	



Appendix D.Habitats Regulations Assessment



Environment

Submitted to Milton Keynes Council Submitted by AECOM Scott House, Alençon Link Basingstoke Hampshire RG21 7PP

United Kingdom

HRA for Milton Keynes Final Local Flood Risk Management Strategy

Prepared by:	Stephanie Cooling Ecologist	Checked by:	James Riley Associate Director
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Rev No	Comments	Checked	Approved	Date
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Appendix A. European Sites

1 Introduction

1.1 Background

AECOM has been commissioned by Milton Keynes Council to carry out a Habitats Regulations Assessment (HRA) of the Local Flood Risk Management Strategy (LFRMS).

It is a requirement of the EU 'Habitats Directive' 1992 (hereafter referred to as the Habitats Directive)¹ and the Conservation of Habitats and Species Regulations 2010 (Box 1) that 'land use plans' are subject to an 'Appropriate Assessment' (AA) if it is likely that they will lead to significant [adverse] effects on a Natura 2000 site (Special Areas of Conservation (SACs), and Special Protection Areas (SPAs)). As a matter of UK Government policy Ramsar sites², candidate Special Areas of Conservation (cSAC) and proposed Special Protection Areas (pSPA) are given equivalent status. These protected sites are collectively referred to as 'European sites' in this report.

EU 'Habitats Directive' 1992

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives." Article 6 (3)

Conservation of Habitats and Species Regulations 2010 (as amended)

"A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site or a European Offshore Marine Site (either alone or in combination with other plans or projects) ... must make an appropriate assessment of the implications for the site in view of that sites conservation objectives ... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site ...".



The Habitats Directive applies the precautionary principle to protected areas; plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. This is in contrast to the Strategic Environmental Assessment (SEA) Directive which does not prescribe how plan or programme proponents should respond to the findings of an environmental assessment; it simply says that the assessment findings (as documented in the 'environmental report') should be 'taken into account' during preparation of the plan or programme. In the case of the Habitats Directive, potentially damaging plans and projects may be permitted only if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation will be necessary to ensure the overall integrity of the Natura 2000 network of protected sites.

As assessment of plans has developed, the term Habitats Regulations Assessment (HRA) has come into currency for describing the overall assessment process (including screening to determine whether significant adverse effects are likely or not) and this term is used below when necessary to distinguish the process from the 'Appropriate Assessment' stage itself.

1.2 Scope of HRA

There are no European sites within Milton Keynes. The scope of the HRA therefore includes all European sites within 10km of Milton Keynes that are designated for features that could potentially be significantly affected by measures or action plans within the man Local Flood Risk Strategy. The Local Flood Authority is required through the Flood Risk Regulations (2009) to prepare responses to flooding from surface water, groundwater, and ordinary water courses (not sewers or main rivers, which are the responsibility of water companies and the Environment Agency, respectively), lakes and canals and to have such information reviewed by the Environment Agency.

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

² Wetlands of International Importance designated under the Ramsar Convention 1979

The local sources of flooding that are required to be managed under the LFRMS are:

- Surface runoff and ponding surface water prior to entry into water courses;
- Groundwater subterranean water in contact with substrates; and
- Water courses other than those on the EAs statutory map of main rivers (therefore including ditches, ponds, lakes, streams and land drains).

Therefore any European sites that could be affected by action plans arising through this Local Flood Risk Management Strategy should be subject to HRA.

In the case of a Local Flood Risk Management Strategy this will include any sites that are affected by water levels or pollution and which could lie within the catchment of or downstream of local flooding events in Milton Keynes.

No European designated sites lie within, or partially within Milton Keynes. The following European sites lie within 10km of Milton Keynes and were subject to an assessment:

- Upper Nene Valley Gravel Pits Ramsar site; and
- Upper Nene Valley Gravel Pits SPA

Both of these European sites are located 6km north of the Milton Keynes authority boundary, but over 17km north of the main concentration of development in Milton Keynes. This document therefore focusses on the potential for impacts on the Upper Nene Valley Gravel Pits Ramsar site and Upper Nene Valley Gravel Pits SPA. Full details of the European designated sites are located within Appendix 1.

1.3 This report

Chapter 2 of this report explains the process by which the HRA has been carried out. Chapter 3 presents an assessment of the LFRMS Action Plan Objectives and Proposed Actions in respect of European sites. The key findings are summarised in Chapter 4: Conclusions. The details of the European sites considered within this report are provided in Appendix 1.

2 Methodology

2.1 The Process of HRA

The HRA has been carried out in the continuing absence of formal Government guidance. Communities & Local Government (CLG) released a consultation paper on AA of Plans in 2006³. As yet, no further formal guidance has emerged although informal guidance documents exist, produced by RSPB and for internal use by Natural England. Figure 1 below outlines the stages of HRA according to current draft CLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.



Figure 1: Four-Stage Approach to Habitat Regulation Assessment

2.2 HRA Task One: Likely Significant Effects (screening)

The first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) or screening test - essentially a high level risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required, and on which aspects any AA will need to be focussed. The essential question is: "Is the [plan] (or any part of the [plan]), either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

This stage of the HRA process is the focus of this report.

2.3 Confirming Other Plans and Projects that may act 'In Combination'

It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European site(s) in question. If any effects of the LFRMS are found to be insignificant (i.e. greater than de minimis but less than significant) they must be assessed in-combination with other plans and projects.

³ CLG (2006) Planning for the Protection of European Sites, Consultation Paper

3 Screening of Proposed Actions

3.1 Introduction

All Objectives and Measures contained within the Local Flood Risk Management Strategy Action Plan were screened for potential conflicts with European sites. In summary, all of the Objectives and Actions could be 'screened out' as there was no potential for the Actions themselves, as they are worded in the LFRMS, to result in a likely significant effect on European designated sites within 10km of Milton Keynes. However, since some of the Actions are very broad, subsequent plans and projects will in some circumstances need to be subject to their own HRA screening. The following table (Table 1) highlights the Objectives and Action Plans and the HRA screening appraisal.

Table 1. Screening Table (Likely Significant Effects)

Objective	Action	Assessment
1. Ensure that drainage management is tailored to Milton Keynes unique drainage system	Improve our understanding of the drainage capacity in the Milton Keynes urban area and its resilience to development.	No LSE: No impact pathway Positive in that it helps provide detail to inform appropriate flood risk management
	Protect the effective maintenance of the current drainage system within Milton Keynes for resilience to future flood risks.	No LSE: No impact pathway Positive in the fact that it will reduce flood risk.
	Ensure drainage infrastructure for new development is future proofed for its design life.	No LSE: No impact pathway Positive in the fact that it will reduce flood risk.
2. Improve the Council's understanding of flood risk from all sources	Improve the Council's understanding of surface water flood risk in the Milton Keynes borough	No LSE: No impact pathway Positive in that it helps provide detail to inform appropriate flood risk management
	Improve the Council's understanding of groundwater flood risk in the Milton Keynes borough	No LSE: No impact pathway Positive in that it helps provide detail to inform appropriate flood risk management
	Improve the Council's understanding of ordinary watercourse flood risk in the Milton Keynes borough	No LSE: No impact pathway Positive in that it helps provide detail to inform appropriate flood risk management
	Develop a procedure for flood investigations under Section 19.	No LSE: No impact pathway Positive in that it improves the effectiveness of flood investigations which will ensure no LSE upon European

Objecti	ve	Action	Assessment
			designated sites
3.	Ensure future development does not have a negative impact on flood risk and lowers	Review MKC planning policy and guidance in relation to flood risk	No LSE: No impact pathway Positive as it will ensure that the planning policies are suitable to ensure suitable flood risk management.
	the risk where possible	Ensure MKC is able to continually fulfil its duty in relation to the SuDS policy changes in April 2015	No LSE: No impact pathway Positive in that it ensures works are conducted in a way that will ensure no LSE upon European designated sites
		Investigate ways to manage urban creep	No LSE: No impact pathway Positive in that it will help reduce flood risk and increase knowledge and awareness of the risk of flooding associated with infrastructure.
		Improve the Council's understanding of how the provision of SuDs will lower the risk of flooding	No LSE: No impact pathway Positive in that it improves knowledge.
4.	Make best use of resources for maximum protection from flooding	Investigate where new technologies can help lower risk	No LSE: No impact pathway Positive as uses up-to-date knowledge.
		Monitor external sources of funding for ongoing flood risk management	No LSE: No impact pathway
		Understand how the Council can work more effectively with landowners	No LSE: No impact pathway
			Positive in that it increases flood risk understanding and knowledge and improves communication.
5.	Improve public awareness of flooding and help communities to become more resilient to	Development new communication tools	No LSE: No impact pathway Positive in that improved communication will ensure efficient flood risk management.
	flooding	Improve education about managed flooding in the public realm	No LSE: No impact pathway Positive in that it shares knowledge and improves communication and awareness.
		Encourage community awareness and community level flood resilience through local actions.	No LSE: No impact pathway

Objective	Action	Assessment
		Positive in that awareness will result in preparedness and thus potentially prevent flooding events happening which could have an LSE upon a European designated site.
	Improve awareness of individuals influence on flood risk.	No LSE: No impact pathway Positive in that it shares knowledge and improves communication and awareness
6. Improve communications between asset owners and build on existing	Clarify asset ownership and/or maintenance responsibility where it is not clearly established	No LSE: No impact pathway Positive in that it helps provide detailed to inform appropriate flood risk management
partnership working	Build on the Council's knowledge about hydrological linkages in the catchment	No LSE: No impact pathway Positive in that it increases flood risk understanding.
	Develop linkages for maintenance programmes between Environment Agency (EA), Milton Keynes Council (MKC), Internal Drainage Board (IDB) and Anglian Water Services (AWS).	No LSE: No impact pathway Positive in that collaboration with other risk management agencies will ensure effective and efficient working practices and prevent adverse effects on European designated sites.
	Maintain the identity of MKC with neighbouring local authorities to ensure effective regional management of risk and sharing of mutual benefits	No LSE: No impact pathway Positive in that collaboration with other risk management agencies will ensure effective and efficient working practices and prevent adverse effects on European designated sites and improved communication will ensure efficient flood risk management.
7. Ensure emergency planning is linked to o best understanding of the risks	ur Maintain links with Local Resilience Forum (LRF)	No LSE: No impact pathway Positive in that it shares knowledge and improves communication and awareness.
	Ensure the protection of critical infrastructure is considered in wider flood management	No LSE: No impact pathway
	Ensure finding of ongoing studies and SWMP is communicated with Emergency planning	No LSE: No impact pathway Positive in that it shares knowledge

3.2 Other plans and projects

This section discusses other plans and projects that may operate in combination with the Flood Risk Management Strategy.

Water Company Water Resources Management Plans could theoretically lead to an in combination effect on European sites sensitive to changes in hydrology, if such plans included strategies that would reduce water availability or impeded water quality to such European sites, and if there were any mechanism by which the LFRMS could contribute to this 'in combination'. However, the LFRMS does not include any strategic Action Plans that that would be likely to lead to such effects.

Development of new housing under local authority Local Plans (principally those in Northamptonshire within which the Upper Nene Valley Gravel Pits SPA/Ramsar site is located) have the potential to increase water demand and increase pressure on water treatment facilities. There is also the potential for other significant effects through recreational pressure or direct loss of supporting habitat for golden plover located outside the SPA/Ramsar site. However, such spatial strategies are subject (through any need for mitigation identified through their own HRA assessments) to timely provision of infrastructure capacity, such as water resource availability and sewerage treatment works. Hydrological changes and water quality reductions would be avoided through regulatory frameworks implemented by the Environment Agency, working with water companies as necessary to ensure approaches to achieve favourable status of European sites. Coupled with the fact that the LFRMS does not contain any detail within the Action Plans that would be likely to lead to any effects on hydrological processes or water quality that would affect European sites, there is no likelihood of in combination effects of the LFRMS alongside local authority strategic plans of this type.

4 Conclusion

The Actions within the Local Flood Risk Management Strategy for Milton Keynes have been screened out as having no Likely Significant Effects on any European sites. The Strategic Objectives and Action Plans within the document all promote measures to avoid or reduce flooding events that arise on land not normally subject to natural flooding. Although two sites exist within 10km of Milton Keynes, the Action Plans of the LFRMS for Milton Keynes do not detail any prescription which at this point can be identified to have a Likely Significant Effect upon a European designated site.

The document promotes collaboration between relevant organisations for management of flood risk, and the co-ordinated approach outlined means that the potential for any unforeseen effects of flood management on European sites is negligible, either alone or in combination with other plans and projects.

Appendix A. European Sites

Appendix A. European Sites within 10km of Milton Keynes

A.1 Upper Nene Valley Gravel Pits Ramsar

The Upper Nene Valley Gravel Pits are located 6km north of Milton Keynes in the country of Northamptonshire. The site extends for approximately 35 kilometres along the alluvial deposits of the River Nene floodplain on the southern outskirts of Northampton, downstream to Thorpe Waterville, north of Thrapston.

The site supports both active and disused sand and gravel pits which form an extensive series of shallow and deep open waters which occur in association with a wide range of marginal features, such as sparsely-vegetated islands, gravel bars and shorelines and habitats including reedswamp, marsh, wet ditches, rush pasture, rough grassland and scattered scrub. This range of habitats and the varied topography of the lagoons provide valuable resting and feeding conditions for concentrations of wintering waterbirds, especially ducks and waders. Species such as golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus* also spend time feeding and roosting on surrounding agricultural land outside the Ramsar site.

The site regularly supports over 20,000 wintering birds of which supports Mute swan *Cygnus olor* and gadwell *Anas strepera* have been recorded with a peak mean of 629 and 772 individuals between 1999 and 2004 respectively.

A.1.1 Features of European interest

The site is designated as a Ramsar because it:

- Regularly support over 20,000 or more water birds
- In the non-breeding season, the site regularly supports 23,821 individual waterbirds (5 year peak mean 1999/2000 – 2003/04
- Regularly supports 1% of the individuals in the populations of Mute swan (peak mean 629 individuals) and Gadwell (peak mean 772 individuals) in any season.

A.1.2 Key vulnerabilities

The key environmental vulnerabilities for the site are:

- Activities connected with ongoing urban development cause significant disturbance to wintering birds if unmanaged
- Lack of grazing is leading to succession from short grassland to rank grassland, scrub / woodland. Whilst this is
 desirable in certain areas, widespread vegetation succession will result in a decrease in the availability of suitable
 habitat for key species
- Invasive species such as Hydrocotyle ranunculoides and Crassula helmsii are present in small areas of the site
- Access by people and dogs both on and off of pubic rights of way is a significant cause of disturbance in some areas. The site is also subject to a variety of recreational activities including fishing & watersports.
- Demand for access and formal / informal recreational activities within the Nene Valley are increasing; development of facilities / opportunities is often in an uncoordinated manner.

A.1.3 Conservation objectives

The Conservation Objectives for the site are, subject to natural change:

- Vegetation succession: This is principally being addressed through agri-environment schemes, predominantly HLS. This is only relevant where large areas of grassland are involved. The scope of agri-environment schemes mean that much of the land is not eligible and there are no alternative sources of funding for the small scale landowners / occupiers to undertake positive management works associated with marginal / aquatic habitats e.g. willow clearance around edge of a lake. Alternative sources for funding e.g. local grant schemes should be investigated. Issues leading to vegetation succession are also to be addressed through enhanced liaison with landowners/occupiers, management agreements and management plans; assisted by powers under the Wildlife & Countryside Act 1981, as amended
- Introduction / invasion of non-native plant species: Invasion of lakeside edges by invasive non-native plants is to be addressed through enhanced liaison with landowners / occupiers and The Environment Agency. Recreation / tourism disturbance: The intensity and location of recreational activities taking place just prior to SSSI notification on 24 November 2005 was considered compatible with maintaining appropriate population levels. This is managed through voluntary agreements assisted by powers within Wildlife & Countryside Act 1981 as amended and The Conservation of Habitats & Species Regulations 2010.
- The development of future recreational opportunities is to be addressed through valley-wide tourism and
 recreational strategies to provide a coordinated approach; including the development of access management
 plans for key sites and that appropriate planning policies are incorporated within strategic planning documents to
 ensure developments take account of direct and indirect recreational disturbance. Natural England intends to
 support and work in partnership with the following initiatives: The Wildlife Trust's Nene Valley Vision, RSPB
 Futurescapes and River Nene Regional Park projects.

A.2 Upper Nene Valley Gravel Pits SPA

The Upper Nene Valley Gravel Pits are located 6km north of Milton Keynes in the country of Northamptonshire. The site extends for approximately 35 kilometres along the alluvial deposits of the River Nene floodplain on the southern outskirts of Northampton, downstream to Thorpe Waterville, north of Thrapston.

The site supports both active and disused sand and gravel pits which form an extensive series of shallow and deep open waters which occur in association with a wide range of marginal features, such as sparsely-vegetated islands, gravel bars and shorelines, and habitats including reedswamp, marsh, wet ditches, rush pasture, rough grassland and scattered scrub. This range of habitat and the varied topography of the lagoons provide valuable resting and feeding conditions for major concentrations of wintering waterbirds, especially ducks and waders. Species such as golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus* also spend time feeding and roosting on surrounding agricultural land outside the SPA.

A.2.1 Features of European interest

The site is designated as an SPA for its breeding populations of:

- Bittern *Botaurus setllaris* supporting peak mean average of 2 individual wintering species which accounts for 2% of Great Britain's population
- Golden plover *Pluvialis apricaria* supporting an peak mean average of 5,790 wintering individuals which accounts for 2.3% of Great Britain's population
- Gadwell *Anas strepera* migratory species supporting a peak mean average of 773 wintering individuals which accounts for 2% of the North west Europe breeding population
- The site regularly supports 20,000 individual waterbirds in any season,
- In the non-breeding season the area regularly supports 23,821 individual waterbirds including wigeon Anas penelope, gadwall Anas strepera, mallard Anas platyrhynchos, shoveler Anas clypeata, pochard Aythya ferina, tufted duck Aythya fuligula, great crested grebe Podiceps cristatus, cormorant Phalacrocorax carbo, bittern Botaurus stellaris, golden plover Pluvialis apricaria, lapwing Vanellus vanellus and coot Fulica atra.

A.2.2 Key vulnerabilities

The key environmental vulnerabilities for the site are:

- The threat from potential development pressures in the urban fringe area is largely addressed by the relevant provisions of the Conservation of Habitats & Species Regulations 2010.
- Issues such as arresting (or locally reversing) vegetation succession will be addressed via management plans.
- The main threat to the site it that of human recreational pressure. The intensity and location of recreational activities taking place just prior to SSSI notification on 24 November 2005 was considered compatible with maintaining favourable population levels. This is managed through voluntary agreements assisted by powers within Wildlife & Countryside Act 1981 as amended and The Conservation of Habitats & Species Regulations 2010.
- The development of future recreational opportunities is to be addressed through valley-wide tourism and recreational strategies to provide a coordinated approach; including the development of access management plans for key sites and that appropriate planning policies are incorporated within strategic planning documents to ensure developments take account of direct and indirect recreational disturbance. Natural England intends to support and work in partnership with the following initiatives: The Wildlife Trust's Nene Valley Vision, RSPB Futurescapes and River Nene Regional Park projects.

A.2.3 Conservation objectives

The Conservation Objectives for the site are, subject to natural change:

- To maintain and restore the extent and distribution, the structure and function (including typical species), and the supporting processes of the habitats and habitats that support qualifying features of the European site.
- To maintain and restore the populations of qualifying features and the habitats that support qualifying features and the distribution of the qualifying species with the European site.
- In all cases, maintenance implies restoration if the feature is not currently in favourable condition.



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