Melton Borough Council Level 1 Strategic Flood Risk Assessment

Final Report

November 2024

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This report describes work commissioned by Melton Borough Council, by an instruction dated 17 January 2024. The Client's representative for the contract was Nic Butcher of Melton Borough Council. Oskar Tonkinson and Georgie Troy of JBA Consulting carried out this work.

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Abbreviations

AEP	Annual Exceedance Probability
AStGWF	Areas Susceptible to Groundwater Flooding
CC	Climate Change
CFMP	Catchment Flood Management Plan
CIRIA	Construction Industry Research and Information Association
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EU	European Union
FAA	Flood Alert Area
FCERM	Flood and Coastal Erosion Risk Management
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FWA	Flood Warning Area
FWMA	Flood and Water Management Act
FWS	Flood Warning System
GSPZ	Groundwater Source Protection Zone
IDB	Internal Drainage Board
JBA	Jeremy Benn Associates
LCC	Leicestershire County Council
LFRMS	Local Flood Risk Management Strategy
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
LPU	Local Plan Update
mAOD	metres Above Ordnance Datum
MBC	Melton Borough Council
NFM	Natural Flood Management
NPPF	National Planning Policy Framework
NRD	National Receptor Database
NVZs	Nitrate Vulnerable Zones
PFRA	Preliminary Flood Risk Assessment

PPG	Planning Practice Guidance
RBD	River Basin District
RBMP	River Basin Management Plan
RMAs	Risk Management Authorities
RoFSW	Risk of Flooding from Surface Water
SFRA	Strategic Flood Risk Assessment
SoP	Standard of Protection
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
WFD	Water Framework Directive

Definitions

1D model: one-dimensional hydraulic model

2D model: two-dimensional hydraulic model

Annual Exceedance Probability: the probability (expressed as a percentage) of a flood event occurring in any given year.

Brownfield: previously developed parcel of land

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

Climate Change: long term variations in global temperature and weather patterns caused by natural and human actions.

Cumecs: the cumec is a measure of flow rate. One cumec is shorthand for cubic metre per second (m^3/s).

Design flood: This is a flood event of a given annual flood probability, which is generally taken as: fluvial (river) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year), or surface water flooding likely to occur with a 1% annual probability (a 1 in 100 change each year), plus an appropriate allowance for climate change, against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

Exception test: Set out in the NPPF, the exception test is a method used to demonstrate that flood risk to people and property will be managed appropriately, where alternative sites at a lower flood risk are not available. The exception test is applied following the sequential test.

Flood defence: Infrastructure used to protect an area against floods such as floodwalls and embankments; they are designed to a specific standard of protection (design standard).

Flood Map for Planning: The EA Flood Map for Planning (Rivers and Sea) is an online mapping portal which shows the Flood Zones in England. The Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences and do not account for the possible impacts of climate change.

Flood Risk Area: An area determined as having a significant risk of flooding in accordance with guidance published by Defra and WAG (Welsh Assembly Government).

Flood Risk Assessment: a site-specific assessment of all forms of flood risk to the site and the impact of development of the site to flood risk in the area.

Fluvial Flooding: Flooding resulting from water levels exceeding the bank level of a river (main river or ordinary watercourse).

Green Infrastructure: a network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of

environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity (NPPF, December 2023).

Greenfield: undeveloped parcel of land

Indicative Flood Risk Area: nationally identified flood risk areas based on the definition of 'significant' flood risk described by Defra and WAG.

Lead Local Flood Authority: the unitary authority for the area or if there is no unitary authority, the county council for the area.

Main river: a watercourse shown as such on the statutory main river map held by the Environment Agency. They are usually the larger rivers and streams. The Environment Agency has permissive powers (not duties) to carry out maintenance and improvement works on main rivers).

Major development: defined in the National Planning Policy Framework (NPPF) as a housing development where 10 or more homes will be provided, or the site has an area of 0.5 hectares or more, or as a non-residential development with additional floorspace of 1,000m² or more, or a site of 1 hectare or more, or as otherwise provide in the Town and Country Planning (Development Management Procedure) (England) Order 2015.

Ordinary watercourse: any river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows but which does not form part of a main river. The local authority or internal drainage board has permissive powers (not duties) on ordinary watercourses.

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

Pluvial flooding: see surface water flooding.

Resilience measures: Measures designed to reduce the impact of water that enters property and businesses; could include measures such as raising electrical appliances.

Resistance measures: Measures designed to keep flood water out of properties and businesses; could include flood guards for example.

Return period: Is an estimate of the interval of time between events of a certain intensity or size, in this instance it refers to flood events. It is a statistical measurement denoting the average recurrence interval over an extended period of time.

Riparian owner: A riparian landowner, in a water context, owns land or property, next to a river, stream or ditch.

Risk Management Authority: the Environment Agency; a lead local flood authority; a district council in an area where there is no unitary authority; an internal drainage board; a water company and a highway authority.

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

Sequential test: Set out in the NPPF, the sequential test is a method used to steer new development to areas with the lowest probability of flooding. The sequential test is a risk-based approach, taking into account all sources of flood risk and climate change.

Sewer flooding: Flooding caused by a blockage or overflowing in a sewer or urban drainage system.

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

Standard of Protection: Defences are provided to reduce the risk of flooding from a river and within the flood and defence field standards are usually described in terms of a flood event return period. For example, a flood embankment could be described as providing a 1% AEP (1 in 100 year) standard of protection.

Surface water flooding: Flooding as a result of surface water runoff as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or watercourse or cannot enter it because the network is full to capacity.

Surface Water Management Plan: SWMPs are non-statutory plans which are used to assess existing surface water problems in an area, identify options to manage the level of surface water risk, and inform investment decisions and planning decisions for new development. They also provide an evidence base for the development of local flood risk management strategies.

Sustainable Drainage Systems: SuDS are methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques, such as grates, gullies and channels.

Water Framework Directive: Under the WFD, all waterbodies have a target to achieve Good Ecological Status (GES) or Good Ecological Potential (GEP) by a set deadline. River Basin Management Plans (RBMPs) set out the ecological objectives for each water body and give deadlines by when objectives need to be met.

Windfall site: a site which becomes available for development unexpectedly and therefore not included as allocated land in a planning authority's local plan.

Executive Summary

This report provides a comprehensive and robust evidence base on flood risk issues to support the review and update of Melton Borough Council's (MBC) Local Plan. During review of the Melton Local Plan in 2022, MBC concluded that while the housing targets and allocations were still appropriate, the development management policies required an update to account for changes to national policy, to improve their effectiveness, and to reflect key priorities for the area. In addition, consideration is required of potential additional allocations for employment/economic development and alterations to the Sustainable Neighbourhood allocations.

This report uses the best available information, including input from key stakeholders. The SFRA applies the latest national planning policy and guidance, including the National Planning Policy Framework (NPPF), which was revised in July 2021 and further updated in December 2023, the Planning Practice Guidance (PPG), which was updated in February 2024, and the updates to the Environment Agency (EA) climate change guidance in July 2021 and May 2022.

Introduction

To support the review and update of the Local Plan for MBC, the key objectives of the assessment are:

- To collate and analyse the latest available information and data for current and future flood risk from all sources, and how these may be mitigated for development.
- To inform decisions in the emerging Local Plan, including informing the sustainability appraisal, the selection of development sites, and planning policies.
- To provide evidence to support the application of the sequential test for the allocation of new development sites, to support MBC in the preparation of their Local Plan.
- To provide a comprehensive set of maps presenting flood risk from all sources that can be used as an evidence base for the update to the Local Plan.
- To help decide when a Flood Risk Assessment (FRA) will be required for individual planning applications.
- To provide advice for applicants carrying out site-specific FRAs, including those at risk from sources other than river and sea flooding, or at risk of flooding in the future due to climate change, and outline specific measures or objectives that are required to manage flood risk.
- To provide the basis for applying the sequential test on planning applications, including by identifying sources of flooding other than those in 'Flood Zones', and those at risk of flooding in the future.
- To identify opportunities to reduce the causes and impacts of flooding and gather information on the land that is likely to be required for flood risk management structures or measures.

Summary of the study area and flood risk

Melton borough is located in the north-east of Leicestershire, England, to the north-east of Leicester. Melton borough is largely rural with numerous villages across the local authority area and one urban area, Melton Mowbray, situated in the centre. Flood risk from all sources has been assessed in this SFRA, and parts of Melton borough are at risk of flooding from the following sources:

- **Fluvial**: The primary fluvial flood risk in the Borough is along the River Eye, River Wreake, River Devon, and Gaddesby Brook. These potential sources of fluvial flooding are rivers that flow through Melton Mowbray near the centre of the Borough, Knipton and Bottesford in the north, and Ashby Folville in the south.
- **Surface water**: The Risk of Flooding from Surface Water map shows a number of prominent overland flow routes that largely follow the topography and watercourses of the Borough. There are some areas where there are additional flow paths and areas of ponding, for example where water is impounded at road or rail embankments and in low-lying areas. While the Borough is largely rural, there are considerable flow routes following the roads through the urban area of Melton Mowbray and the village of Bottesford, alongside isolated areas of ponding, which may affect many properties across these settlements.
- **Climate change:** Areas at risk of flooding today are likely to become at increased risk in the future and the frequency of flooding will also increase in such areas, due to climate change. Flood extents will increase; in some locations, this may be minimal, but flood depth, velocity and hazard may have more of an impact due to climate change. It is recommended that MBC work with other Risk Management Authorities (RMAs) to review the long-term sustainability of existing and new development when developing climate change plans and strategies for Melton Borough.
- **Sewer:** Severn Trent Water provide water services and sewerage services across the majority of the Borough, with Anglian Water serving small parts within the north, east and south boundaries. Severn Trent Water provided details of historic sewer flooding across the Borough. Postcodes identified with a higher number of previous sewer flooding events are in Asfordby, Old Dalby, Waltham on the Wolds, Stathern, Harby, and Long Clawson.
- **Groundwater**: The Areas Susceptible to Groundwater Flooding map shows that in general, areas with greater than 50% susceptibility to groundwater flooding are limited, although do occur around flow routes such as the River Eye, River Wreake and River Devon. Generally, these areas are located in the far north of the Borough and at locations spanning east to west along the course of the River Wreake and River Eye. The JBA Groundwater Emergence Map reflects this, with similar flow routes experiencing emergence levels within 0.5m of the surface. Furthermore, the data shows groundwater emergence levels within 0.25m of the

surface in the north of the Borough in Easthope and Bottesford, and in the east of Melton Mowbray.

- **Canals:** The Grantham Canal runs through the north of the Borough, through a largely rural area, passing villages such as Harby, Plungar, and Redmile. The canal has the potential to interact with other watercourses such as the Winter Beck and become a flow path during flood events or in a breach scenario. The Canal and River Trust were consulted as part of the SFRA and provided details of 21 recorded overtopping incidents and 3 breach incidents which occurred on the Grantham Canal, largely concentrated to the west of Hose, in the west of the Borough, with one breach incident occurring to the west of Redmile. Local canal trusts in Melton borough have restoration plans for former navigation routes such as the Oakham Canal and Melton Mowbray Navigation. Upon any changes to these networks in Melton borough, the impacts on flood risk will need to be assessed and the Local Plan updated.
- **Reservoirs:** The current mapping shows that there are eight reservoirs located within Melton borough, with 'wet day' or 'dry day' scenarios encroaching into the Borough. The level and standard of inspection and maintenance required under the Reservoirs Act means that the risk of flooding from reservoirs is relatively low. However, there is a residual risk of a reservoir breach, and this risk should be considered in any site-specific FRAs (where relevant) in accordance with the updated PPG.

Defences

The EA Asset Information Management System (AIMS) dataset provides information on flood defence assets across the Borough. A small number of areas are shown to have reduced flood risk due to defences, including land surrounding Knipton Reservoir and small sections along the River Devon at Muston, and Gaddesby Brook at Ashby Folville. Most notably, there are large sections along the Rivers Wreake and Eye through Melton Mowbray which benefit from reduced flood risk due to defences, according to the EA's ‘Reduction in risk of flooding from rivers and sea’ dataset.

Development and flood risk

The sequential and exception test procedures for Local Plans and FRAs have been documented, along with guidance for planners and developers. Links have been provided for relevant guidance documents and policies published by other Flood RMAs such as the Lead Local Flood Authority (LLFA) and the Environment Agency (EA).

The risk of flooding should be reviewed as early as possible in the development process to ensure that opportunities are taken to reduce the risk of flooding on and off the site. Where necessary, development and redevelopment within Melton borough will require an FRA appropriate to the scale of the development and to the scope as agreed with the LLFA and/or EA. FRAs should consider flood risk from all sources including residual risk, along with promotion of Sustainable Drainage Systems (SuDS) to create a conceptual drainage strategy and safe access/egress at the development in the event of a flood. Latest climate

change guidance (last updated in May 2022) should also be taken into account, for the lifetime of developments. Planners and developers must check that modelling in line with the most up to date EA climate change guidance has been run.

How to use this report

Planners

This SFRA provides recommendations regarding all sources of flood risk in Melton borough, which can be used to inform policy on flood risk within the emerging Local Plan. This includes how the cumulative impact of development should be considered.

It provides the latest flood risk data and guidance to inform the sequential test**,** for relevant allocations and individual planning applications. As set out in the Preparing a flood risk assessment: standing advice, this includes major and non-major development if any proposed building, access and escape route, land-raising or other vulnerable element will be in Flood Zone 2 or 3, in Flood Zone 1 and the LPA's SFRA shows it will be at increased risk of flooding during its lifetime, or is subject to sources of flooding other than rivers or sea. MBC can use this information to apply the sequential test to strategic allocations and identify where the exception test will also be needed.

Developers

The SFRA provides guidance for developers, which can be used by development management staff to establish when an FRA is required and to assess whether site-specific FRAs meet the required quality standard. It can also be used to help identify which locations and development may require emergency planning provision.

For sites that are not strategic allocations (sites which are key to the delivery of the Local Plan), developers will need to use this SFRA to help apply the sequential test. For both strategic allocations and windfall sites, developers will need to apply the exception test in the following cases, as set out in Table 2 of the PPG in The Flood Risk and Coastal Change:

- Highly vulnerable development in Flood Zone 2
- Essential infrastructure in Flood Zone 3a or 3b
- More vulnerable development in Flood Zone 3a

While current guidance in Table 2 of the PPG only applies to the EA's Flood Map for Planning, which displays risk of flooding from rivers and the sea, the updated PPG (August 2022) now requires all sources of flood risk to be assessed within the sequential test and therefore it follows that, where sufficient datasets are available, the exception test should also take into account all sources of flood risk.

A site-specific FRA should be used to inform the exception test at the planning application stage.

This SFRA is a strategic assessment and does not replace the need for site-specific FRAs where a development is either within Flood Zones 2 or 3 or greater than a hectare in Flood Zone 1**,** is less than a hectare and located in an area affected by sources of flooding other than rivers and the sea, or is in an area within Flood Zone 1 which has critical drainage

problems as notified by the EA. In addition, a sustainable surface water drainage strategy will be needed for major development, or a development requiring an FRA, to satisfy the LPA and technical consultees. Further assessments may also be required at this stage to manage the risk from sewer flooding to a site, and developers should contact the relevant water and sewerage provider for further advice. Where an FRA is not required, development applications should still make clear the risk of flooding will not be made worse and identify a viable drainage solution.

Informing an FRA

Developers can use the information in this SFRA, alongside site-specific research to help scope out what additional work will be needed in a detailed FRA. To do this, they should refer to Section 4, MBC's Mapping Portal, and Appendix B (Data sources used in the SFRA). At the planning application stage, developers may need to undertake more detailed hydrological and hydraulic assessments of the watercourses to verify flood extent (including latest climate change allowances, last updated in May 2022), inform master-planning and demonstrate, if required, that the exception test is satisfied. As part of the EA's updated guidance on climate change, which must be considered for all new developments and planning applications, developers will need to undertake a detailed assessment of the impact of climate change on flood risk to the site as part of the planning application process when preparing FRAs. Additionally, at planning application stage, flood risk from other sources should be assessed if identified at the development site.

Developers need to check that new development does not increase existing runoff rates from a site or contribute to cumulative effects at sensitive locations, see Section 7 and Appendix F: Cumulative Impact Assessment (CIA). Section 9 provides information on the surface water drainage requirements of the LLFA. SuDS should be considered at the earliest stages that a site is developed which will help to minimise costs and overcome any site-specific constraints.

Site-specific FRAs will need to identify how flood risk will be mitigated so development is safe from flooding for its lifetime and does not have an adverse effect on third parties or other areas. The FRA will also need to consider emergency arrangements, including how there will be safe access and egress from the site.

Any developments located within an area protected by flood defences and where the Standard of Protection (SoP) is not of the required standard (either now or in the future) should be identified and the use of developer contributions considered to fund improvements to the defences.

Neighbourhood Plans

Neighbourhood planning groups can use the information in this SFRA to assess the risk of flooding to sites within their community, using Section 2, Section 4, and the flood mapping on MBC's Mapping Portal. The SFRA will also be helpful for developing community level flood risk policies in high flood risk areas. Similarly, all known available recorded historical flood events for Melton borough are listed in Section 4.1. This can be used to supplement local knowledge regarding areas worst hit by flooding. Ongoing and proposed flood

alleviation schemes planned by MBC are outlined in Section 6 and Section 8.3 discusses mitigations, resistance and resilience measures which can be applied to alleviate flood risk to an area.

Mapping

The SFRA mapping on MBC's Mapping Portal highlights on a strategic scale flood risk from fluvial, surface water and reservoirs sources, and areas susceptible to groundwater flooding; as well as where the effects of climate change are most likely. The maps are useful to provide a community level view of flood risk but may not identify if an individual property is at risk of flooding or depict small scale changes in flood risk. Local knowledge of flood mechanisms will need to be included to complement mapping in this SFRA. Similarly, all known available recorded historical flood events across the study area are listed in Section 4.1. This can be used to supplement local knowledge regarding areas worst affected by flooding. Water storage areas designated by the EA to alleviate flood risk are also shown in the mapping. The mapping data should always be supplemented by direct consultation with the relevant wastewater company to ascertain if there is any site-specific risk from a public sewer. This is because sewer flood risk information is not publicly available and would need to be considered on a site-specific basis.

Cumulative Impact Assessment (CIA)

Under the NPPF, strategic policies and their supporting SFRAs, are required to ‘consider cumulative impacts in, or affecting, local areas susceptible to flooding’ (Paragraph 166). A CIA has identified which catchments in Melton borough are more sensitive to the cumulative impact of development and where more stringent policy regarding flood risk is recommended. Any development in these areas should seek to contribute to work that reduces wider flood risk in those catchments. Developer contributions can be made to the maintenance and provision of flood risk management assets, Sustainable Drainage SuDS, and flood warning.

1 Introduction

1.1 Purpose of the Strategic Flood Risk Assessment

“Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the EA and other relevant flood RMAs, such as lead local flood authorities and internal drainage boards.” (NPPF, Paragraph 166).

In January 2024, Melton Borough Council (MBC) commissioned an updated Level 1 Strategic Flood Risk Assessment (SFRA) to reflect the latest legislation and guidance. This SFRA provides a comprehensive and robust evidence base to support MBC's Local Plan and replaces the previous Level 1 SFRA report (2015).

This 2024 SFRA will be used to inform decisions on the location of future development and the preparation of land use planning policies for the long-term management of flood risk, reflecting the implications of the August 2022 changes to the PPG.

As the data available for SFRAs and the relevant legislation is continually changing, an SFRA should be updated to reflect changes where applicable and practicable. Under any changes in guidance or legislation, the implications on the SFRA should be considered and a review undertaken where this is deemed reasonably necessary.

1.2 Local Plan

As the Local Planning Authority (LPA), MBC are responsible for producing a Local Plan, determining planning applications, enforcement in response to breaches of planning control, and supporting neighbourhood planning. MBC are currently compiling the evidence base to support updates to their Local Plan, which was adopted in 2018 and covers the period 2011 to 2036.

1.3 Levels of SFRA

The PPG identifies the following two levels of SFRA:

- **Level 1 assessment:** All LPAs are required to undertake this assessment. Where potential site allocations are not at major flood risk and where development pressures are low, a Level 1 assessment is likely to be sufficient, without the LPA progressing to a Level 2 assessment. The Level 1 assessment should be of sufficient detail to enable application of the sequential test, to inform the allocation of development to areas of lower flood risk.
- **Level 2 assessment:** Required where land outside flood risk areas cannot appropriately accommodate all necessary development, creating the need to apply the NPPF’s exception test, or if an LPA believe they may receive high

numbers of applications in flood risk areas on sites not identified in the Local Plan. In these circumstances the assessment should consider the detailed nature of the flood characteristics within a Flood Zone and assessment of other sources of flooding.

This is a Level 1 SFRA assessment. If all the development proposed is not located outside areas of Flood Risk, a Level 2 assessment may be required to inform the Exception Test. The PPG can be accessed on Flood risk and Coastal Guidance.

1.4 SFRA outputs

This SFRA aims to provide the following outputs:

- Identification of existing national and local policy and technical updates.
- Identification of any strategic flooding issues or cumulative effects which may have cross boundary implications.
- Appraisal of all potential sources of flooding, including main river, ordinary watercourse, surface water, sewers, groundwater, and reservoirs.
- Review of historic flooding incidents.
- Reporting on the Standard of Protection (SoP) provided by existing flood risk management infrastructure.
- Mapping showing distribution of flood risk across all Flood Zones from all sources of flooding including climate change allowances.
- Mapping defining the extent of Flood Zone 3b (functional floodplain).
- Assessment of the potential increase in flood risk due to climate change to identify areas at risk of flooding in the future.
- FRA guidance for developers.
- Identification of the requirements for developers to consider emergency planning arrangements.
- Assessment of strategic surface water management issues, how these can be addressed through development management policies and the application of SuDS.
- Recommendations of the criteria that should be used to assess future development proposals and the development of a sequential test and sequential approach to flood risk.
- Assessment of strategic flood risk solutions that can be implemented to reduce risks.
- Information to assist identifying land that is likely to be needed for flood risk management infrastructure.

1.5 SFRA study area

Melton borough is located in the north-east of Leicestershire, England, to the north-east of Leicester. Melton borough is largely rural with numerous villages across the local authority area and one urban area, Melton Mowbray, situated in the centre.

Melton borough is bounded by six other authorities:

- Rushcliffe Borough
- Newark and Sherwood District
- South Kesteven District
- Rutland
- Harborough District
- Charnwood Borough

An overview of the study area showing the neighbouring authorities is shown in Figure 1-1.

Severn Trent Water is the primary water and sewerage service provider for most of Melton Borough. However, Anglian Water also serves specific areas, including Normanton in the north of the Borough, parts of Harston, Croxton Kerrial, Saltby, Sproxton, Buckminster, Sewstern and Wymondham at the eastern boundary, and Knossington at the southern tip of the Borough. Water and sewerage service provider boundaries can be viewed in Figure 1-2.

The main watercourses which flow through Melton borough, according to the Environment Agency's (EA) Main River Map, are as follows:

- Asfordby Relief Channel
- Edendale Brook
- Gaddesby Brook
- River Devon
- River Eye
- River Wreake
- Scalford Brook
- Thorpe Brook; and
- Welby Brook.

The River Devon flows in a northerly direction from Knipton Reservoir and through Bottesford in the north of the Borough. Gaddesby Brook flows in a westerly direction in the south-west of Melton borough. The River Eye flows in a westerly direction through Melton Mowbray. Thorpe Brook, Scalford Brook and Edendale Brook are tributaries of the River Eye. The River Eye then becomes the River Wreake in the east of Melton Mowbray, which flows from the centre to the west of the Borough before its confluence with the River Soar approximately 6.8km west of the Borough. These watercourses are shown in Figure 1-3.

1.6 Consultation

SFRAs should be prepared in consultation with other Risk Management Authorities (RMAs). In addition to MBC LPA, the following parties have been consulted during the preparation of this SFRA either through data requests or draft report reviews:

- Leicestershire County Council (LCC) LLFA
- Environment Agency (EA)
- Severn Trent Water
- Anglian Water
- Internal MBC council departments, including drainage and engineering teams, emergency planners, and technical services.

In addition, the following parties were consulted through data requests during the preparation of this SFRA:

- Parish Councillors and Ward Members
- Canal and River Trust
- Neighbouring authorities bordering Melton borough:
  - Rushcliffe Borough
  - Newark and Sherwood District
  - South Kesteven District
  - Rutland
  - Harborough District
  - Charnwood Borough

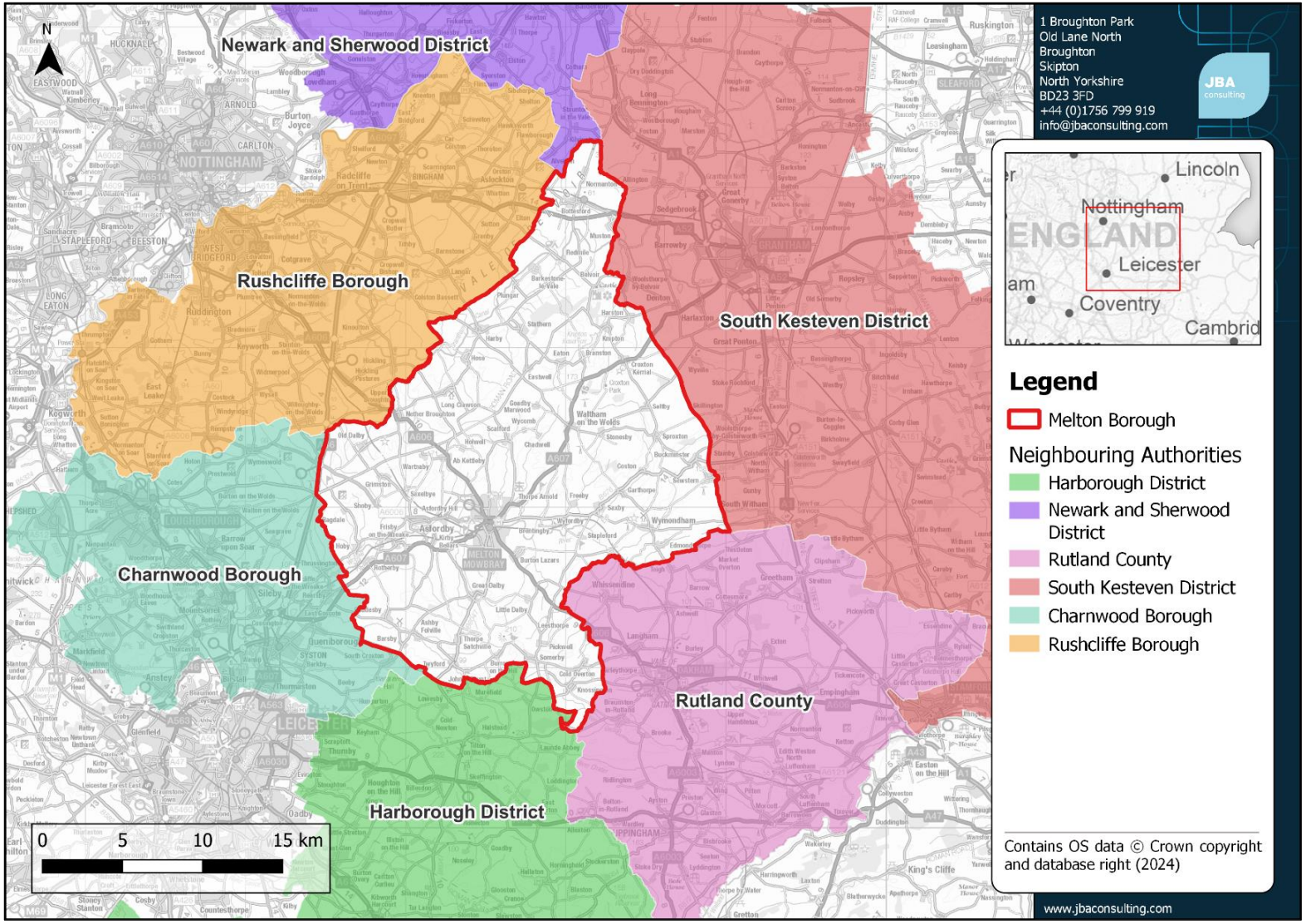


Figure 1-1: Study area and neighbouring authorities

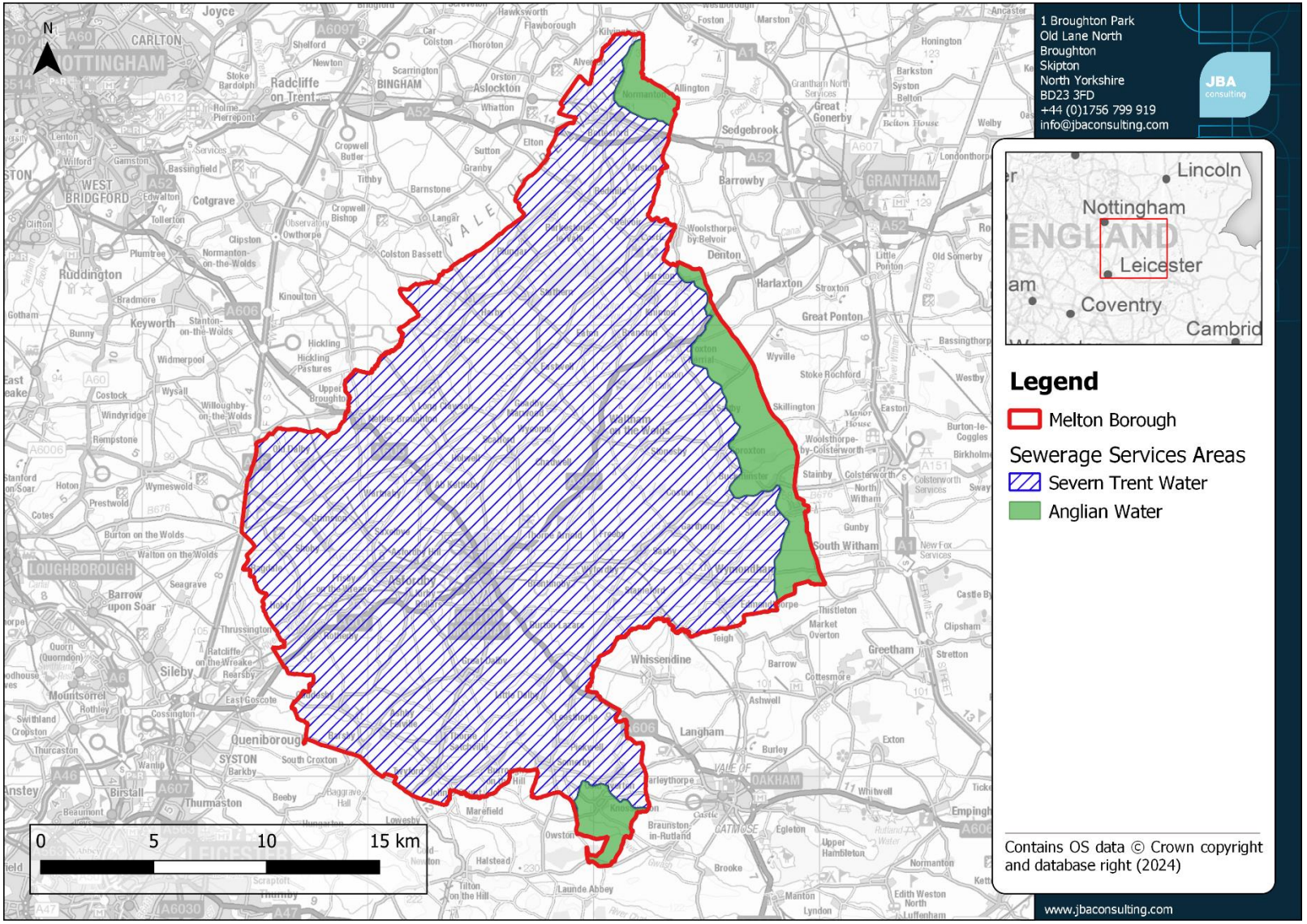


Figure 1-2: Wastewater company boundaries in Melton borough

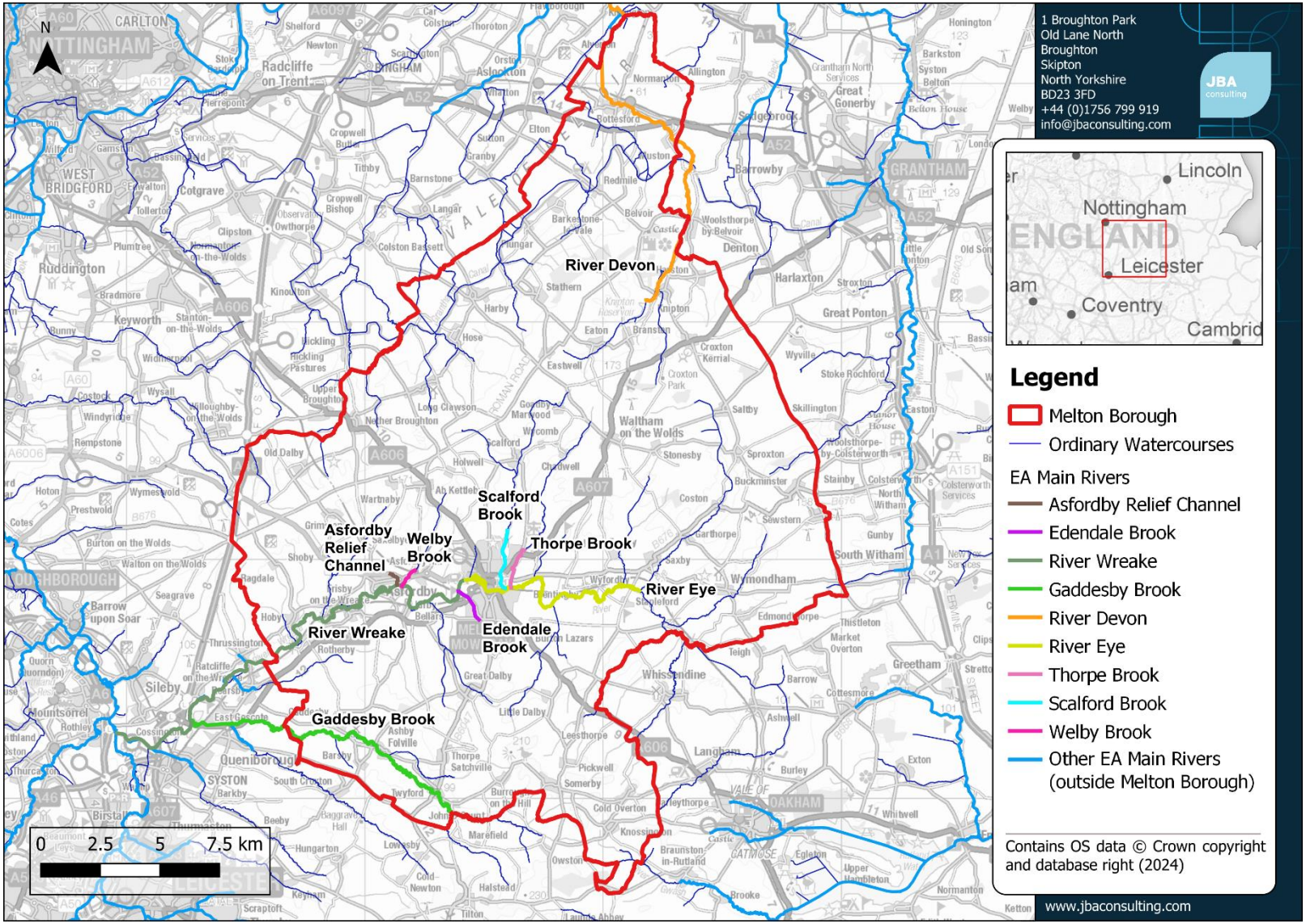


Figure 1-3: Main watercourses in Melton borough

1.7 Use of SFRA data

Level 1 SFRAs are high-level strategic documents and do not go into detail on an individual site-specific basis. The primary purpose is to provide an evidence base to inform the preparation of Local Plans and any future flood risk policies.

Developers will still be required to undertake site-specific FRAs where required to support Planning Applications. Developers will be able to use the information in the SFRA to scope out the sources of flood risk that will need to be explored in more detail at site-specific level.

Appendix C presents an SFRA User Guide, further explaining how this SFRA data should be used, including reference to relevant sections of the SFRA, how to consider different sources of flood risk and recommendations and advice for sequential and exception tests.

On the date of publication, this SFRA contains the latest available flood risk information. Over time, new information will become available to inform planning decisions, such as updated hydraulic models (which then update the Flood Map for Planning), updated information on other sources of flood risk or evidence showing future flood risks, new flood event information, new defence schemes and updates to policy, legislation, and guidance. The EA are updating the National Flood Risk Assessment (NaFRA2), which will provide mapping on current and future flood risk from rivers, the sea and surface water, based on existing detailed information and improved national data. The planned timescales for publishing are set out in the online guidance Updates to national flood and coastal erosion risk information. Developers should check the online Flood Map for Planning in the first instance to identify any major changes to the Flood Zones and the long-term flood risk mapping portal for any changes to flood risk from surface water or inundation from reservoirs.

1.8 Structure of this report

Table 1-1 sets out the contents of each section of the report, and guidance on how to use each section. Appendices of this SFRA are also included.

Table 1-1: Contents of the report

Section	Contents	How to use
Executive summary	This section focuses on how the SFRA can be used by planners, developers, and neighbourhood planners.	Users should refer to this section for a summary of the Level 1 findings and recommendations.

Section	Contents	How to use
1. Introduction	This section provides a background to the study, the Local Plan stage the SFRA informs, the study area, the roles and responsibilities for the organisations involved in flood management and how they were involved in the SFRA. It also provides a short introduction to how flood risk is assessed and the importance of considering all sources.	Users should refer to this section for general information and context.
2. Flood risk policy and strategy	This section sets out the relevant legislation, policy, and strategy for flood risk management at a national, regional, and local level.	Users should refer to this section for any relevant policy which may underpin strategic or site-specific assessments.
3. Planning policy for flood risk management	This section provides an overview of both national and existing Local Plan policy on flood risk management. This includes the Flood Zones, application of the sequential approach and sequential/exception Test process. It provides guidance for MBC and Developers on the application of the Sequential and Exception Tests for both allocations and windfall sites, at allocation and planning application stages.	Users should use this section to understand and follow the steps required for the sequential and exception tests.
4. Understanding flood risk in the Melton borough	This section provides an overview of the characteristics of flooding affecting the study area and key risks including historical flooding incidents, flood risk from all sources and flood warning arrangements.	This section should be used to understand all sources of flood risk in Melton borough including where has flooded historically. This section may also help identify any data gaps, in conjunction with Appendix B.

Section	Contents	How to use
5. Impact of climate change	This section outlines the latest climate change guidance published by the EA and how this was applied to the SFRA. It also sets out how developers should apply the guidance to inform site-specific FRAs.	This section should be used to understand the climate change allowances for a range of epochs and conditions, linked to the vulnerability of a development.
6. Flood alleviation schemes and assets	This section provides a summary of current flood defences and asset management and future planned schemes. It also introduces actual and residual flood risk.	This section should be used to understand if there are any defences or flood schemes in a particular area, for further detailed assessment at site specific stage.
7. Cumulative impact of development and strategic solutions	This section introduces the Cumulative Impact Assessment (CIA), which is included as Appendix F.	Planners should use this section to help develop policy recommendations for the cumulative impact of development, in conjunction with Appendix F.
8. Flood risk management for developers	This section contains guidance for developers on FRAs, considering flood risk from all sources.	Developers should use this section to understand requirements for FRAs and what conditions/guidance documents should be followed, as well as mitigation options.
9. Surface water management and Sustainable Drainage Systems	This section provides an overview of SuDS, Guidance for developers on Surface Water Drainage Strategies, considering any specific local standards and guidance for SuDS from the LLFA.	Developers should use this section to understand what national, regional, and local SuDS standards are applicable. Hyperlinks are provided.
10. Summary and recommendations	This section summarises sources of flood risk in the study area and	Developers and planners should use this as a

Section	Contents	How to use
	outlines planning policy recommendations. It also sets out the next steps.	summary of the SFRA. Developers should refer to the Level 1 SFRA recommendations when considering site specific assessments.
Appendices	Appendix A: Interactive Mapping Portal user guide Appendix B: Data sources used in the SFRA Appendix C: SFRA User Guide Appendix D: Flood Alert and Flood Warning Areas Appendix E: Summary of flood risk across Melton borough Appendix F: Cumulative Impact Assessment (CIA)	Planners should use these appendices to understand what data has been used in the SFRA, to inform the application of the Sequential and Exception Tests, as relevant, and to use these maps and tabulated summaries of flood risk to understand the nature and location of flood risk.

1.9 Understanding flood risk

The following content provides useful background information on how flooding arises and how flood risk is determined.

1.9.1 Sources of flooding

Flooding is a natural process and can happen at any time in a wide variety of locations. It constitutes a temporary covering of land not normally covered by water and presents a risk when people and human or environmental assets are present in the area that floods. Assets at risk from flooding can include housing, transport and public service infrastructure, commercial and industrial enterprises, agricultural land, and environmental and cultural heritage. Flooding can occur from many different and combined sources and in many ways. Major sources of flooding include:

- Fluvial (rivers) - inundation of floodplains from rivers and watercourses; inundation of areas outside the floodplain due to influence of bridges, embankments and other features that artificially raise water levels; overtopping or breaching of defences; blockages of culverts; blockages of flood channels/corridors.
- Surface water - direct run-off from adjacent land.

- Sewer flooding - surcharging of piped drainage systems (public sewers, highway drains).
- Groundwater - water table rising after prolonged rainfall to emerge above ground level remote from a watercourse; most likely to occur in low-lying areas underlain by permeable rock (aquifers); groundwater recovery after pumping for mining or industry has ceased.
- Infrastructure failure - reservoirs; industrial processes; burst water mains; blocked sewers or failed pumping stations.
- Other sources of flooding including breaching of flood defences, overwhelmed canals, lakes, and other artificial sources.

Different types and forms of flooding present a range of different risks and the flood hazards of speed of inundation, depth and duration of flooding, can vary greatly. With climate change, the frequency, pattern, and severity of flooding are expected to change and become more damaging.

1.9.2 Defining flood risk

Section 3 (subsection 1) of the Flood and Water Management Act (FWMA) defines the risk of a potentially harmful event (such as flooding) as 'a risk in respect of an occurrence is assessed and expressed (as for insurance and scientific purposes) as a combination of the probability of the occurrence with its potential consequences.'

Thus, it is possible to summarise flood risk as:

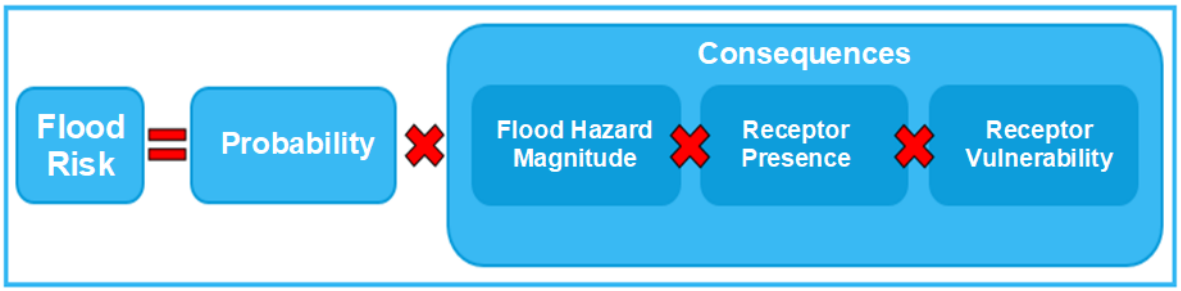


Figure 1-4 Flood risk summary calculation

1.9.2.1 Source-Pathway-Receptor model

Flood risk can be assessed using the Source-Pathway-Receptor model where:

- The source is the origin of the floodwater, principally rainfall.
- A pathway is a route or means by which a receptor can be affected by flooding, which includes rivers, drains, sewers, and overland flow.
- A receptor is something that can be adversely affected by flooding, which includes people, their property, and the environment.

This is a standard environmental risk model common to many hazards and should be the starting point of any assessment of flood risk. All these elements must be present for flood risk to arise. Having applied the Source-Pathway-Receptor model it is possible to mitigate

the flood risk by addressing the source (often very difficult), blocking, or altering the pathway, or removing the receptor by steering development away.

The planning process is primarily concerned with the location of receptors, taking appropriate account of potential sources and pathways that might put those receptors at risk. It is therefore important to define the components of flood risk to apply this guidance in a consistent manner.

1.9.2.2 Probability

The probability of flooding is expressed as a percentage based on the average frequency measured or extrapolated from records over many years. A 1% probability indicates the flood level that is expected to be reached on average once in a hundred years; it has a 1% chance of occurring in any one year, not that it will occur at least once every hundred years.

Considered over the lifetime of development, such an apparently low frequency or rare flood has a significant probability of occurring. For example:

- A 1% flood has a 26% (1 in 4) chance of occurring at least once in a 30-year period - the period of a typical residential mortgage.
- And a 49% (1 in 2) chance of occurring in a 70-year period - a typical human lifetime.

1.9.2.3 Consequences

The consequences of flooding include fatalities, property damage, disruption to lives and businesses, with severe implications for people (for example financial loss, emotional distress, health problems). Consequences of flooding depend on the hazards caused by flooding (depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality), the receptors that are present and the vulnerability of these receptors (type of development, nature of the population for example age structure, presence, and reliability of mitigation measures).There are also consequences that are less tangible such as vulnerability. Not everyone is affected equally by impacts of flooding. Some individuals or communities may be more vulnerable due to socio-economic factors and health inequalities, which can impact people’s ability to cope with, adapt to and recover from flooding events.

Some individuals or communities may be experiencing multiple vulnerabilities which make it harder to prepare for, respond to and recover from flooding. For example, older people (especially those over 75) may experience multiple, compounding, vulnerabilities such as poor health, disability/mobility difficulties, social isolation and living in certain types of housing that might increase their overall vulnerability.

2 Flood risk policy and strategy

This section sets out the flood risk management roles and responsibilities for different organisations and relevant legislation, policy, and strategy.

2.1 Roles and responsibilities for Flood Risk Management in Melton borough

There are different organisations in and around Melton borough that have responsibilities for flood risk management, known as Risk Management Authorities (RMAs). These are listed in Table 2-1, with a summary of their responsibilities.

Further information on the roles and responsibilities of the EA is available in Annex A of the National Flood and Coastal Erosion Risk Management Strategy (FCERM) for England.

The Local Government Association also provide further information on the roles and responsibilities when managing flood risk on their Managing flood risk: roles and responsibilities webpage.

Table 2-1: Roles and responsibilities for Risk Management Authorities (RMAs)

Risk Management Authority	Strategic Level	Operational Level	Planning role
Environment Agency (EA)	Strategic overview for all sources of flooding, National Strategy, and general supervision	Main River (for example the River Eye) and reservoirs (Flood Risk Activity Permits (FRAPS)), enforcement, and works). Issuing Flood Warnings and Alerts	Statutory consultee for certain development in Flood Zones 2 and 3 and all works within 20 metres of a main river. Advice on when to consult the EA can be found in National flood risk standing advice for local planning authorities guidance.
Leicestershire County Council (LCC) as Lead Local Flood Authority (LLFA)	Coordination of Local Flood Risk Management and maintaining a Local Flood Risk Management Strategy (LFRMS)	Surface water, groundwater, and ordinary watercourses (consenting, enforcement, and works)	Statutory consultee for major developments

Risk Management Authority	Strategic Level	Operational Level	Planning role
Severn Trent Water and Anglian Water	Asset Management Plans, supported by Periodic Reviews (business cases), develop drainage and wastewater management plans	Public sewers	Non-statutory consultee for planning applications
Highways Authorities - Highways England for motorways and trunk roads and LCC for non-trunk roads	Highway drainage policy and planning	Highway drainage	Statutory consultee regarding highways design standards and adoptions

2.1.1 Riparian ownership

Land and property owners are responsible for the maintenance of watercourses either on or next to their properties, called Riparian Owners. Riparian Owners are also responsible for the protection of their properties from flooding as well as other management activities, for example by maintaining riverbeds/ banks, controlling invasive species, and allowing the flow of water to pass without obstruction. More information can be found on the Government website in the EA publication Owning a watercourse guidance (2018).

When it comes to undertaking works to reduce flood risk, the EA, and LCC as the LLFA do have jurisdiction but limited resources must be prioritised and targeted to where they can have the greatest effect. Permissive powers mean that RMAs are permitted to undertake works on watercourses but are not obliged.

2.1.2 Relevant legislation

The following legislation is relevant to development and flood risk in Melton borough. Hyperlinks are provided to external documents:

- Town and Country Planning Act (1990), Water Industry Act (1991) , Land Drainage Act (1991) , Environment Act (1995) , which set out the regulations for development on land in England and Wales.
- Flood and Water Management Act (2010) – as amended and implemented via secondary legislation. These set out the roles and responsibilities for organisations that have a role in Flood Risk Management.

- The Land Drainage Act (1991, as amended) and Environmental Permitting Regulations (2018) also set out where developers will need to apply for additional permission (as well as planning permission) to undertake works to an ordinary watercourse or main river.
- The Water Environment Regulations (2017) – these transpose the European Water Framework Directive (WFD) (2000) into law and require the EA to produce River Basin Management Plans (RBMPs). These aim to improve/maintain the water quality of aquatic ecosystems, riparian ecosystems, and wetlands so that they reach 'good' status.
- The Environment Act 2021 requires developers to provide Biodiversity Net Gain (BNG) and for LPAs to develop Local Nature Recovery Strategies (LNRS). Strategic site allocations in Local Plans which present opportunities for BNG or areas for habitat improvement/creation identified by the LNRS could have parallel opportunities to contribute to reduced flood risk from a range of sources.
- Other environmental legislation such as the Habitats Directive (1992), Environmental Impact Assessment Directive (2014), and Strategic Environmental Assessment Directive (2001) also apply as appropriate to strategic and site-specific developments to guard against environmental damage.
- Flood Risk Regulations (2009) - these transpose the European Floods Directive (2000) into law and require the EA and LLFAs to produce PFRAs and identify nationally significant Flood Risk Areas (FRAs).
- The Planning and Compulsory Purchase Act (2004) Section 19(1A) requires local planning authorities to include in their Local Plans 'policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change.'

2.2 Key national, regional, and local policy documents and strategies

Table 2-2 summarises relevant national, regional, and local flood risk policy and strategy documents and how these apply to development and flood risk. Hyperlinks are provided to external documents. These documents may:

- Provide useful and specific local information to inform FRAs within the local area.
- Set the strategic policy and direction for flood risk management and drainage – they may contain policies and action plans that set out what future flood mitigation and climate change adaptation plans may affect a development site. A developer should seek to contribute in all instances to the strategic vision for flood risk management and drainage in Melton borough.
- Provide guidance and/or standards that inform how a developer should assess flood risk and/or design flood mitigation and SuDS.

The following sections provide further details on some of these documents and strategies.

Table 2-2: National, regional, and local flood risk policy and strategy documents.

Policy level	Document, lead author and date	Contextual information	Policy and measures	Development design requirements	Next update due
National	Flood and Coastal Management Strategy (EA) 2020	Yes	Yes	No	2026
National	National Planning Policy Framework updated in December 2023	Yes	Yes	Yes	-
National	Planning Practice Guidance (PPG) updated in August 2022	Yes	Yes	Yes	-
National	How to prepare a strategic flood risk assessment	Yes	No	No	-
National	Building Regulations Part H (MHCLG) 2010	Yes	No	Yes	-
Regional	River Trent Catchment Flood Management Plan (EA) 2010	Yes	Yes	No	-
Regional	River Welland Catchment Flood Management Plan (EA) 2009	Yes	Yes	No	-
Regional	River Witham Catchment Flood Management Plan (EA) 2009	Yes	Yes	No	-
Regional	Anglian River Basin District River Basin Management Plan (EA) 2022	Yes	Yes	No	2027
Regional	Humber River Basin District River Basin Management Plan (EA) 2022	Yes	Yes	No	2027
Regional	Anglian River Basin District Flood Risk Management Plan 2021 to 2027 (EA)	Yes	Yes	No	-

Policy level	Document, lead author and date	Contextual information	Policy and measures	Development design requirements	Next update due
Regional	Humber River Basin District Flood Risk Management Plan 2021 to 2027 (EA)	Yes	Yes	No	-
Regional	Anglian Water Draft Water Resources Management Plan 2022	Yes	No	No	2024
Regional	Anglian Water Drainage and Wastewater Management Plan 2023	Yes	No	No	-
Regional	Severn Trent Draft Water Resources Management Plan 2022	Yes	No	No	2024
Regional	Severn Trent Water Drainage and Wastewater Management Plan 2023	Yes	No	No	-
Regional	Climate change guidance for development and flood risk (EA) last updated May 2022	Yes	No	Yes	-
Local	Preliminary Flood Risk Assessment for Leicestershire (LCC) 2011	Yes	No	No	-
Local	Preliminary Flood Risk Assessment for Leicestershire addendum (LCC) 2017	Yes	No	No	-
Local	Leicestershire Local Flood Risk Management Strategy (LCC) 2024	Yes	Yes	No	-
Local	Planning Applications: Lead Local Flood Authority Statutory Consultation Checklist (LCC) 2018	Yes	Yes	Yes	-

2.2.1 The National Flood and Coastal Erosion Risk Management Strategy for England (2020)

The National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England provides the overarching framework for future action by all RMAs to tackle flooding and coastal erosion in England. The EA brought together a wide range of stakeholders to develop the strategy collaboratively. The Strategy looks ahead to 2100 and the actions needed to address the challenge of climate change.

The Strategy has been split into three high level ambitions:

- Climate resilient places
- Today's growth and infrastructure resilient in tomorrow's climate
- A nation ready to respond and adapt to flooding and coastal change.

The Strategy was laid before parliament in July 2020 for formal adoption and published alongside the Flood and Coastal Erosion Risk Management: policy statement. The statement sets out five key commitments which will accelerate progress to better protect and better prepare the country for the coming years:

1. Upgrading and expanding flood defences and infrastructure across the country,
2. Managing the flow of water to both reduce flood risk and manage drought,
3. Harnessing the power of nature to not only reduce flood risk, but deliver benefits for the environment, nature, and communities,
4. Better preparing communities for when flooding and erosion does occur, and
5. Ensuring every area of England has a comprehensive local plan for dealing with flooding and coastal erosion.

It can be expected that the implementation of the National Strategy will lead to the publication of new guidance and practice that is focused on resilience and adaptation over the coming years. It will be important to adjust the content of the SFRA so that changes in approach are captured in the delivery of the Local Plan.

2.2.2 Flood Risk Regulations (2009)

The Flood Risk Regulations (FRRs) (2009) translate the European Union (EU) Floods Directive into UK law. The EU requires Member States to complete an assessment of flood risk (known as a Preliminary Flood Risk Assessment (PFRA) and then use this information to identify areas where there is a significant risk of flooding. For these Flood Risk Areas, States must then undertake Flood Risk and Hazard Mapping and produce Flood Risk Management Plans (FRMPs). This cycle is repeated on a six-yearly basis. As of 1 January 2024, the Retained EU Law (Reform and Revocation) Bill automatically repealed any retained EU law (REUL) not otherwise preserved or replaced in UK law before the end of 2023, including the Flood Risk Regulations 2009 which transposed the EU Floods Directive into legislation. This is because much of the FRRs is duplicated in existing domestic legislation, namely the Flood and Water Management Act 2010. The EA and LLFAs in England will therefore no longer be required to comply with a third cycle of planning,

however the government expects to see continued implementation of the FRMPs 2021-2027.

The FRRs direct the EA to do this work for river, sea, and reservoir flooding. LLFAs must do this work for surface water, ordinary watercourse, and groundwater flooding. The first cycle of planning ran from 2009 until 2015. Within this time LLFAs published their first PFRAs. The first FRMPs were also published. The second cycle of planning commenced in 2016. Within this cycle, LLFAs published addendums to their existing PFRAs, the EA published their PFRA, and the second cycle FRMPs were published in December 2022, with actions to manage flood risk across England for the period 2021 to 2027.

The EA PFRA for England (2018) for river, sea and reservoir flooding identifies nationally significant Flood Risk Areas for these sources. This PFRA identified 116 Flood Risk Areas nationally, 40 Flood Risk Areas within the Humber River Basin District (RBD), and 18 Flood Risk Areas within the Anglian RBD. In Melton borough, there are four Flood Risk Areas.

The LCC PFRA, published in 2011, is a high-level screening exercise which provides an assessment of flood risk based on data from parish, town, borough and district councils, Leicestershire County Council, the EA, Severn Trent Water and Anglian Water. This identified four Flood Risk Areas within the LCC LLFA area including Leicester City, Market Harborough, Loughborough, and Hinckley and Burbage. None of these are situated within Melton borough.

The 2017 addendum to the 2011 LCC PFRA, identified numerous significant flood events since 2011. This led LCC to conduct one Section 19 Flood Investigation to establish the cause of the flooding and what can be done to reduce future risk, as well as sparking a number of flood alleviation/resilience schemes either already in progress or programmed for future years. Areas of flood risk are not confined to the Flood Risk Areas identified through the PFRAs; these other areas are addressed under 'Strategic Areas'. LCC have also published an updated Assessment of Local Flood Risk (2024).

Melton borough lies across the Anglian and Humber FRMP areas. The second FRMP is a plan to manage significant flood risk in the FRAs identified within the Anglian Northern and Humber RBDs within the EA PFRA. Neither the Anglian FRMP or the Humber FRMP identified any FRAs within Melton borough for main rivers and the sea.

More information on district and national scale measures is available on the EA's online interactive mapping, in the Humber RBD FRMP, and in the Leicestershire Flood Risk Management Strategy.

2.2.3 Flood and Water Management Act (2010)

The FWMA was passed in April 2010 following the recommendations made within the Pitt Review following the flooding in 2007. It aims to improve both flood risk management and the way water resources are managed.

The FWMA has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for Local Authorities, as LLFAs, designed to manage local flood risk (from surface water, ground

water and ordinary watercourses) and to provide a strategic overview role of all flood risk for the EA. Schedule 3 of the FWMA (2010) is expected to be implemented by the government in the short term, following periods of consultation, making SuDS mandatory for new developments in England. Further information on Schedule 3 is provided in Section 9.1.

The content and implications of the FWMA provide considerable opportunities for improved and integrated land use planning and flood risk management by Local Authorities and other key partners. The integration and synergy of strategies and plans at national, regional, and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth.

2.2.4 The Water Framework Directive and Water Environment Regulations and River Basin Management Plans

The purpose of the Water Framework Directive (WFD), which was transposed into English Law by the Water Environment Regulations (2003), is to deliver improvements across Europe in the management of water quality and water resources through a series of plans called River Basin Management Plans (RBMPs).

The WFD requires the production of RBMPs for each River Basin District (RBD). RBMPs support the government's framework for the 25-year environment plan and allow local communities to find more cost-effective ways to further improve our water environments. Water quality and flood risk can go hand in hand in that flood risk management activities can help to deliver habitat restoration techniques.

The EA manages the RBMPs and must review and update them every six years. The first cycle of RBMPs were published in 2009 and were most recently updated in 2022. The relevant RBMPs for Melton borough are the Humber RBD RBMP and the Anglian RBD RBMP.

2.2.5 Strategic Flood Risk Assessment guidance

This Level 1 assessment is undertaken in accordance with the 'How to prepare a Strategic Flood Risk Assessment guidance', which was last updated in May 2024. The guidance sets out the approaches to both Level 1 and Level 2 assessment and can be found in How to prepare a strategic flood risk assessment.

2.2.6 Catchment Flood Management Plans

Catchment Flood Management Plans (CFMPs) are high-level strategic plans providing an overview of flood risk across each river catchment. The EA use CFMPs to work with other key-decision makers to identify and agree long-term policies for sustainable flood risk management.

Melton borough lies within the River Trent CFMP Region, River Welland CFMP region, and River Witham CFMP region, which set out policies relating to flooding from rivers, surface water, and groundwater within their respective catchment areas.

2.2.7 Leicestershire County Council Local Flood Risk Management Strategy (LFRMS) 2024

LCC is responsible for developing, maintaining, applying, and monitoring a LFRMS. The most recent Strategy was published in February 2024 and is used as a means by which the LLFA co-ordinates Flood Risk Management on a day-to-day basis.

The LFRMS sets out five principles which apply across all local flood risk management work, to help ensure consistency with legislation, the National FCERM Strategy, and other plans. There are:

- Working in partnership
- Working with communities
- Delivering multiple benefits
- Adapting to climate change
- Taking a risk-based approach

The LFRMS then sets out five objectives (local projects, asset, watercourses and catchments, encouraging sustainable development, flood preparedness, response & recovery, and better understanding flood risk) which describe the main ways in which local flood risk is managed in Leicestershire. These are strategic objectives, implemented through the measures set out in the Action Plan.

The Local Flood Risk Management Strategy for Leicestershire is available on LCC's website.

2.2.8 Local policy and guidance for SuDS

The 2023 NPPF states that: ‘Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate’ (Paragraph 175) and 'development should only be allowed in areas at risk of flooding where… it can be demonstrated that… c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate' (Paragraph 173). When considering major planning applications, local planning authorities (LPAs) should consult the relevant LLFA on the management of surface water to satisfy that:

- The proposed minimum standards of operation are appropriate.
- Using planning conditions or planning obligations there are clear arrangements for on-going maintenance over the development’s lifetime.

At the time of writing this SFRA, the following documents and policies are relevant to SuDS and surface water in Melton borough:

- SuDS Manual (C753), published in 2007 and updated in 2015.
- Defra Non-statutory technical standards for sustainable drainage systems, 2015
- Defra National Standards for sustainable drainage systems Designing, constructing (including LASOO best practice guidance), operating and maintaining drainage for surface runoff, 2011

- Building Regulations Part H (MHCLG), 2010
- LCC LLFA Checklist and Interim LLFA Checklist Guidance

The 2023 NPPF states that flood risk should be managed “using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding" (Paragraph 167). Alongside flood risk management, SuDS can provide amenity, biodiversity, recreation, community, and water resources benefits. Where possible, priority should be given to SuDS that can deliver multiple benefits.

2.2.9 Water Cycle Studies

Water Cycle Studies assist local authorities to select and develop growth proposals that minimise impacts on the environment, water quality, water resources, infrastructure, and flood risk and help to identify ways of mitigating such impacts.

No water cycle studies have been undertaken within this study area.

2.2.10 Surface Water Management Plans

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location. SWMPs are undertaken, when required, by LLFAs in consultation with key local partners who are responsible for surface water management and drainage in their area. SWMPs establish a long-term action plan to manage surface water in a particular area and are intended to influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning, and future developments.

No SWMPs have been undertaken within this study area.

2.2.11 Water Resources Management Plans (WRMPs)

Under the duties set out in sections 37A to 37D of the Water Industry Act 1991, all water companies across England and Wales must prepare and maintain a Water Resources Management Plan (WRMP). This must be prepared at least every five years and reviewed annually.

WRMPs should set out how a water company intends to achieve a secure supply of water for their customers and a protected and enhanced environment.

Severn Trent Water published a draft WRMP 2024 in November 2022. It demonstrates long-term plans to accommodate the impacts of population growth, drought, and climate change and looks ahead to 2085. The final WRMP is due to be published in Summer 2024.

Similarly, Anglian Water has published their WRMP 2024.

To consolidate the whole of the country's WRMPs there is: A summary of England's revised draft WRMP's.

2.2.12 Drainage and Wastewater Management Plans (DWMPs)

Water and sewage companies must produce a Drainage and Wastewater Management Plan (DWMP), covering a minimum of 25 years, which looks at current and future capacity, pressures, and risks to their networks such as climate change and population growth. They detail how a company plans to work with RMAs and drainage asset owners to manage future pressures. The relevant DWMPs for the Borough are the Anglian Water Drainage and Wastewater Management Plan (2023) and the Severn Trent Water Drainage and Wastewater Management Plan (2023). These include evidence to support and inform the business plans of the water companies, to align short term investment needs with longer-term needs of the catchments out to 2050 and beyond.

2.2.13 Neighbourhood Development Plans (NDPs)

The information on flood risk provided in this SFRA can be used to help determine which areas of neighbourhood plans may be appropriate for development. Where flood risk is indicated to a plan area, there should be due regard to the National Planning Policy Framework (NPPF) policies on flood risk, and where development is proposed, this should align with MBC's application of the sequential test and if necessary, the exception test.

There are currently 18 Neighbourhood Plan Areas in Melton borough which are at various stages of development. Further information on these can be viewed on MBC's Neighbourhood development plans webpage. As specified in the Planning Practice Guidance (PPG) (paragraph 015), development planned in these areas will need to be:

- Informed by suitable assessment of flood risk from all sources, both now and in the future;
- steer development to areas of lower flood risk as far as possible;
- ensure that any development in an area at risk of flooding would be safe, for its lifetime taking account of climate change impacts;
- be able to demonstrate how flood risk to and from the plan area/ development site(s) will be managed, so that flood risk will not be increased overall, and that opportunities to reduce flood risk, for example, through the use of sustainable drainage systems where appropriate, are included in the plan/order.

Advice on managing the risk of flooding within NDPs can be found in the Neighbourhood Planning for the Environment toolkit which has been created by the EA and other statutory agencies.

3 Planning policy for flood risk management

This section summarises national planning policy for development and flood risk.

3.1 National Planning Policy Framework and Guidance

The revised NPPF was published in July 2021 and was most recently updated in 2023. The NPPF sets out Government's planning policies for England. It must be considered in the preparation of local plans and is a material consideration in planning decisions. The NPPF advises on how flood risk should be considered to guide the location of future development and FRA requirements. The NPPF states that:

“Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards” (Paragraph 166).

The PPG on flood risk and coastal change was published in March 2014 and sets out how the policy should be implemented. Diagram 1 in the PPG sets out how flood risk should be considered in the preparation of Local Plans. It was last updated in August 2022.

3.2 The risk-based approach

The NPPF takes a risk-based approach to development in flood risk areas. Since July 2021 the approach has adjusted the requirement for the sequential test (as defined in paragraph 167 of the NPPF) so that all sources of flood risk are included in the consideration.

The updated PPG further states in Paragraph 23 of the Flood risk and coastal change guidance: "Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk".

The general implications of these are summarised as follows:

- The test will cease to be based on the use of the Flood Zones describing river and sea flood risk, and instead be based on whether development can be located in the lowest risk areas (from low to medium to high) of flood risk both now and in the future. The test now applies to all sources of flood risk – whereas previously the test was only performed for present day flood risk for the “Flood Zones” which only included river and sea flood risk.
- Understanding flood risk to sites based on their vulnerability and incompatibility as opposed to whether development is appropriate.
- In addition to the flood risk mapping describing river and sea flood risk, there is mapping available to describe surface water flood risk. Although, this is not

conceptually similar to the flood risk mapping for rivers and sea due to the differing nature of flooding.

- As there is no available competent risk mapping for other sources of risk it is not considered appropriate to use such mapping in a strict process that involves comparison of differing levels of flood risk. Reservoir, groundwater and sewer flood risk are addressed through the SFRA using a variety of datasets to analyse and describe the risk to areas across Melton borough.
- A more formal assessment of these sources is undertaken in a Level 2 SFRA and involves a more detailed assessment of the implications of reservoir, sewer, and groundwater flood risk to establish that more appropriate locations at lower risk are not available. Consultation with the sewerage undertaker is necessary to take in to account any hydraulic incidents and the latest available modelling information on sewer flood risk.
- Consideration is given to all sources of flood risk using the available data to complete the sequential test so decisions on the selection of preferred sites for allocation address the potential implications of groundwater, reservoir, and sewer flooding. Also, where necessary it identifies sites where consideration should be given to satisfying the requirements of the exception test.

3.2.1 Flood Zones - Fluvial Risk

The definition of the Flood Zones is provided below. The Flood Zones do not consider defences, except when considering the functional floodplain. This is important for planning long term developments as long-term policy and funding for maintaining flood defences over the lifetime of a development may change over time. The Flood Zones are:

- Flood Zone 1: Low risk: less than a 0.1% chance of river and sea flooding in any given year.
- Flood Zone 2: Medium risk: between a 1% and 0.1% chance of river flooding in any given year.
- Flood Zone 3a: High risk: between a 3.3% and 1% chance of river flooding in any given year.
- Flood Zone 3b: Functional Floodplain: land where water has to flow or be stored in times of flood (greater than a 3.3% chance of river flooding in any given year). Only water compatible and essential infrastructure are permitted in this zone and should be designed to remain operational in times of flood, resulting in no loss of floodplain or blocking of water flow routes. Annex 3 of the NPPF (gov.uk) provides information on flood risk vulnerability.

Important note on Flood Zone information in this SFRA

Flood Zones 2 and 3a, as shown on MBC's Mapping Portal, show the same extents as the online EA's Flood Map for Planning (FMfP), except for the EA's River Devon (2021) model. This data has recently been incorporated into the Flood Zones however it will not be available to view within the FMfP until 2025. Until then, a comment will appear in the area

affected by the changes, informing that new information is available and to contact the EA to obtain it. This data was obtained for the purposes of this SFRA and is included within the Flood Zone 2 and 3 layers on the Mapping Portal.

The EA Flood Zones do not cover all catchments or ordinary watercourses with areas <3km². As a result, whilst the EA Flood Zones may show an area is in Flood Zone 1, there may be a flood risk from a smaller watercourse(s) not shown in the Flood Zones.

Flood defences should be considered when delineating the functional floodplain. The 3.3% AEP defended modelled flood extents have been used to represent Flood Zone 3b, where available from the EA. For this SFRA, these extents were available for the EA's River Devon (2021) and Lower Wreake and tributaries (2015) models. Further details on the specific model extents used are provided in Appendix B. There are three Flood Storage Areas within Melton borough which have been included in the designation of Flood Zone 3b following consultation with the EA. These include the Brentingby Flood Storage Reservoir, Scalford Brook Reservoir, and Frisby Lake.

For areas outside of the detailed model coverage, Flood Zone 3a has been used as a conservative proxy for Flood Zone 3b. Further work should be undertaken as part of a detailed site-specific FRA to define and refine the extent of Flood Zone 3b where no detailed modelling exists. Caution should also be applied where the conservative Flood Zone 3b extent encompasses existing urban areas which would not otherwise be "designed to flood".

3.2.2 Flood Zones - surface water risk

To address the requirement that flood risk from all sources is included in the sequential test in addition to the fluvial Flood Zones, a further set of surface water zones have also been defined.

The surface water zones define locations at either lower or higher risk of surface water flooding based on the extent of the 1% AEP plus 40% climate change allowance surface water event. This is the upper end allowance for the 2070s epoch which the EA climate change guidance recommends is assessed within SFRAs.

- Zone A – lower risk of surface water flooding (lies outside the 1% AEP plus 40% climate change surface water extent)
- Zone B – higher risk of surface water flooding (lies within the 1% AEP plus 40% climate change surface water extent)

Surface water mapping does not strictly describe the same conceptual risk zone as is defined for river and sea flooding (even though it is notionally associated with the same probability) as the mapping is based on different assumptions. However, it does create a product that can accommodate sequential testing, as it can facilitate strategic decisions that direct development to land in a “lower risk surface water flood zone”.

Surface water flood risk can also be of much shallower depth and is not normally experienced for such extensive durations as river flooding. However, the safety implications of placing proposed development at locations where there is surface water flood risk is a material consideration and thus if it is proposed to place development in a Zone of high surface water flood risk then consideration should be given to the demonstrating that part “b” of the Exception Test (outlined in section 3.2.5) can be satisfied (with the presumption that part “a” was satisfied if the land was allocated in the Local Plan).

3.2.3 Flood Zones - other sources of flooding

While all sources of flood risk should inform the sequential test, the national data available for use in this SFRA for other sources of flooding such as reservoirs are not sufficient 'risk-based' datasets to inform the sequential test in the same way as the available data for fluvial and surface water risk, and therefore a more detailed assessment will be required for these sources where a Level 2 assessment is appropriate.

A reservoir's primary function is to provide water storage; however, they can be a source of flooding and present a residual risk of flooding. The latest available mapping (Reservoir Flood Extents) now shows “wet day” and “dry day” reservoir inundation extents. The “wet day” being a reservoir breach at the same time as a 0.1% AEP river flood (as this is a likely time when a reservoir might fail) and the "dry day" shows the failure just from the water retained by the dam. However, neither set of mapping describes a risk-based scenario, as they do not indicate the relative risk to land based on the probability of dam failure but are intended to show a “worst credible case”.

By comparing the extent of Fluvial Flood Zone 2 with the Reservoir Flood Map Wet Day Extent two zones can be defined:

1. Where reservoir flooding is predicted to make fluvial flooding worse.
2. Where reservoir flooding is not predicted to make fluvial flooding worse.

The mapping could be used to direct proposed new development away from locations that could potentially be affected by reservoir flood risk. However, it is different to the risk pertaining to river and sea flooding and further assessment would be required to understand the magnitude of the potential hazard. This mapping will also identify locations where proposed development could result in a change to the risk designation of a reservoir. If proposed sites are located in a zone at reservoir risk, it will be necessary to include a more detailed assessment in a Level 2 SFRA.

With regards to sewer and groundwater flood risk, for the purposes of this SFRA it is not possible to prepare zone maps as the appropriate analyses and data are not available nationally. Sewer flooding is presented as postcode point locations, and groundwater mapping data shows susceptibility of risk and likelihood of emergence. The latter could be viewed in conjunction with the surface water mapping to ascertain where emerging overland flows may travel above ground. The existing datasets on sewer flooding and groundwater are therefore used to inform the sequential approach to development at a site in accordance with Paragraph 167 of the NPPF (which could in some instances result in alternative sites being considered).

Direct consultation with the relevant water and sewerage company will be necessary to further understand the history of flooding from sewers and the water network once site-specific details are known, as sewer flood risk is a site-specific issue.

3.2.4 The sequential test

Firstly, land at the lowest risk of flooding from all sources should be considered for development. A test is applied called the ‘sequential test’ to do this. Figure 3-1 summarises the sequential test.

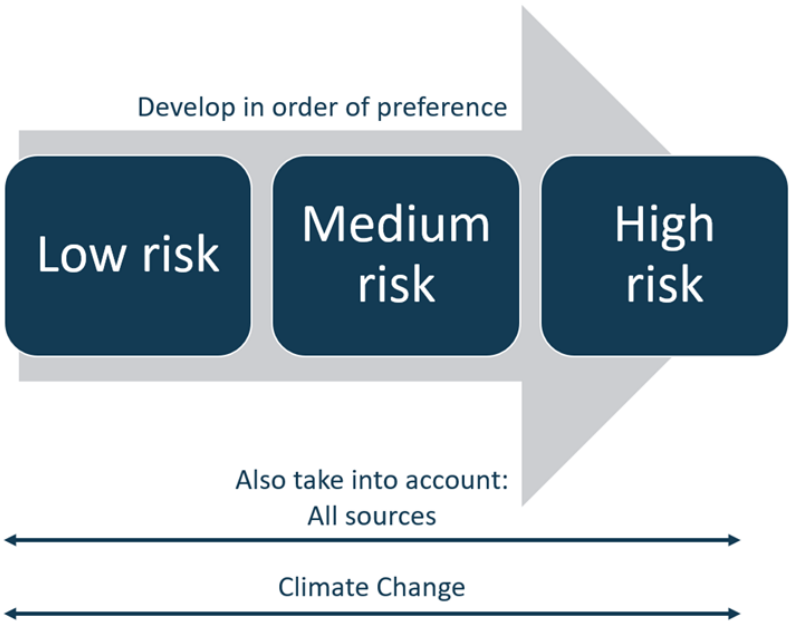


Figure 3-1: Summary of the sequential test

The LPA will apply the sequential test to strategic allocations. As set out in the FRA Standing Advice, for all other developments, evidence must be supplied to the LPA, with a planning application, that the development has passed the test if any proposed building, access and escape route, land-raising or other vulnerable element will be:

- in Flood Zone 2 or 3;
- in Flood Zone 1 and the SFRA shows it will be at increased risk of flooding during its lifetime; or
- subject to sources of flooding other than rivers or sea,

The LPA should define a suitable search area for the consideration of alternative sites in the sequential test. The sequential test can be undertaken as part of a Local Plan Sustainability Appraisal. Alternatively, it can be demonstrated through a free-standing document, or as part of Strategic Housing Land / Employment Land Availability Assessments.

Whether any further work is needed to decide if the land is suitable for development will depend on both the vulnerability of the development and the Flood Zone it is proposed for. Table 2 of the PPG (paragraph 079) shows whether, having applied the sequential test first, the vulnerability of development is not compatible with a particular Flood Zone and where the exception test is required to determine the suitability of that vulnerability of development to the flood zone.

Figure 3-2 shows Diagram 2 of the PPG (paragraph 026). This illustrates the sequential test as a process flow diagram using the information contained in this SFRA to assess potential development sites against areas of flood risk and development vulnerability compatibilities. This is a stepwise process, but a complex one, as several of the criteria used are qualitative and based on experienced judgement. The process must be documented, and evidence used to support decisions recorded.

In addition, the risk of flooding from other sources and the impact of climate change must be considered when considering which sites are suitable to allocate. Appendix C addresses the use of flood risk information in the performance of the sequential test.

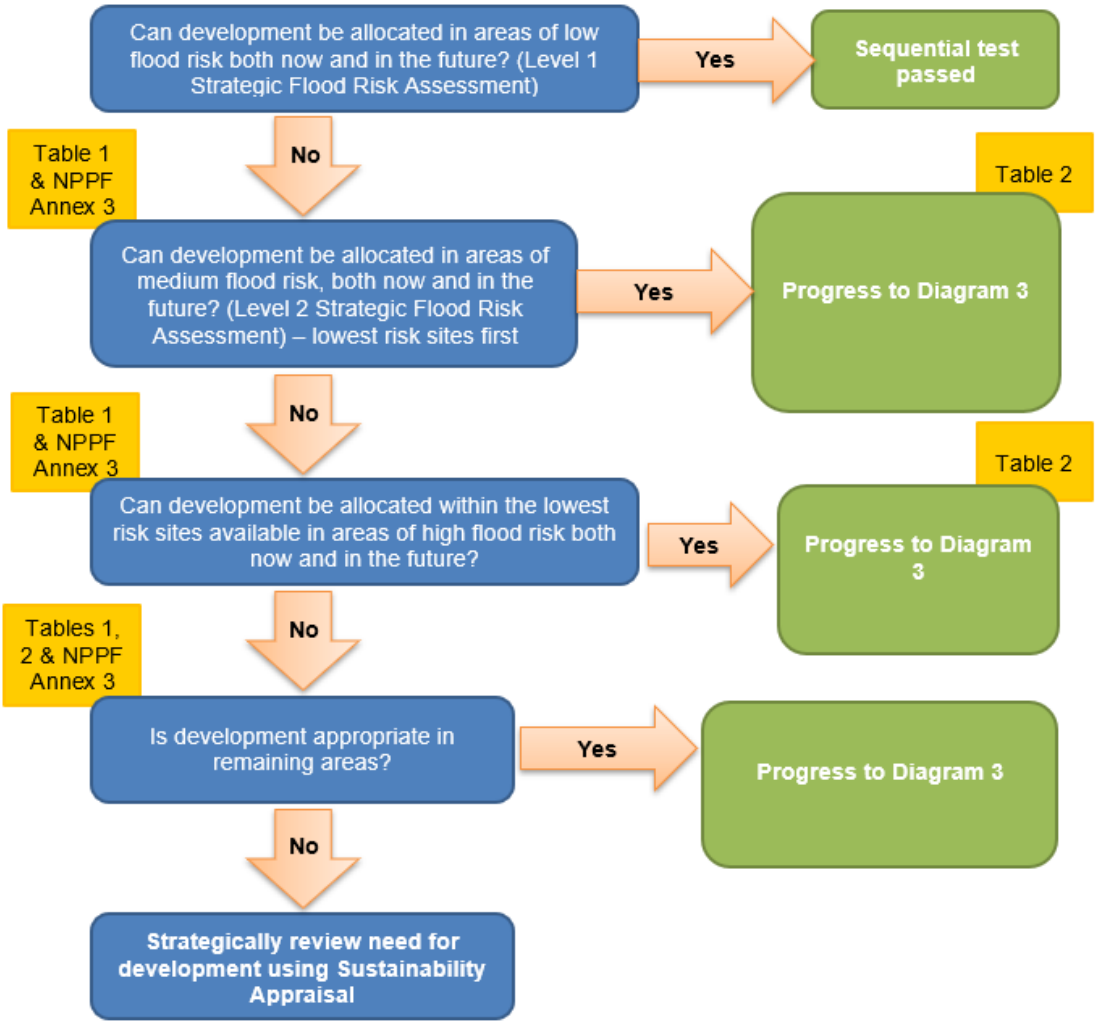


Figure 3-2: Process for application of the sequential test where required.

3.2.5 The Exception Test

It will not always be possible for all new development to be located on land that is not at risk from flooding. To further inform whether land should be allocated, or Planning Permission granted, a greater understanding of the scale and nature of the flood risks is required. In these instances, the exception test will be required. Diagram 3 of the PPG (paragraph 033) summarises the Exception Test and is shown in Figure 3-3.

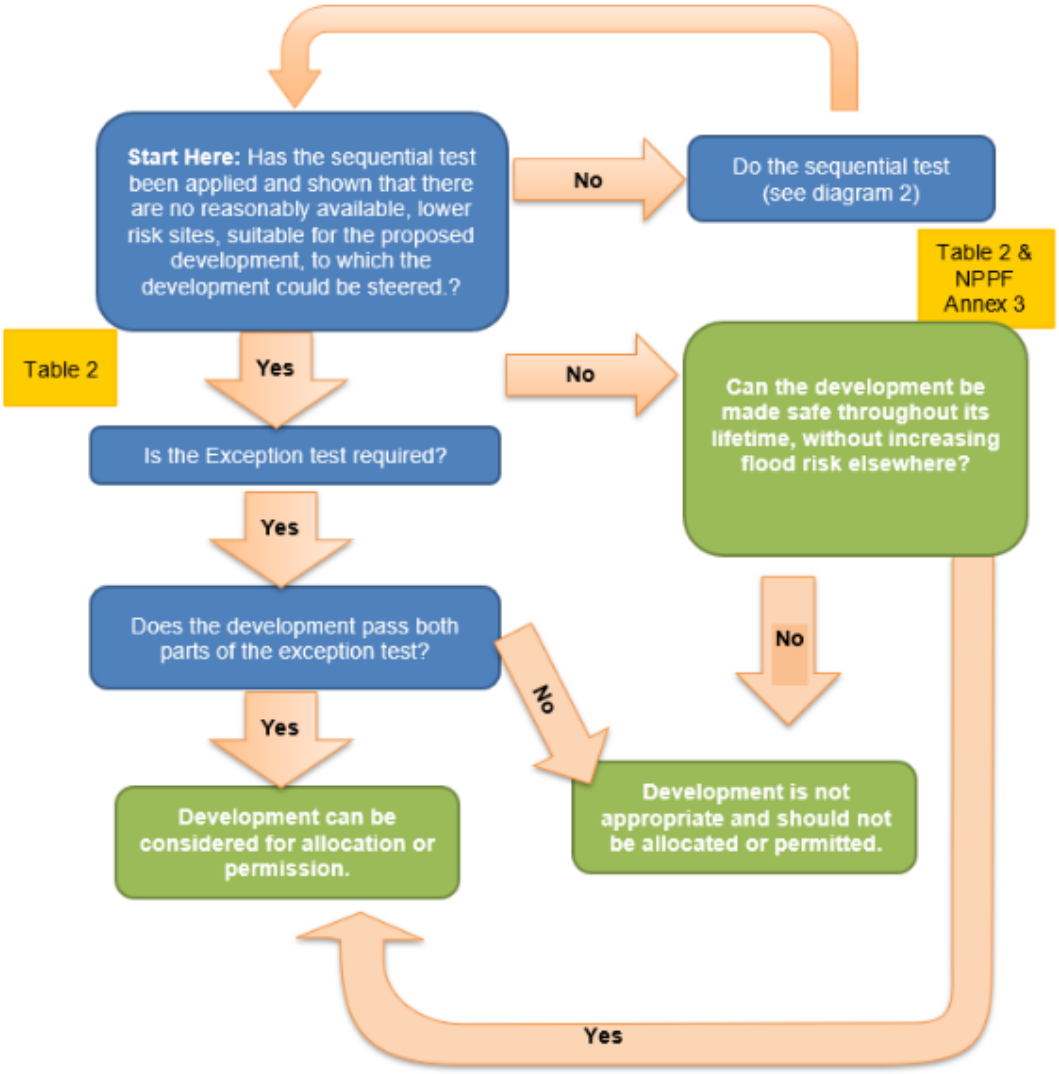


Figure 3-3: Process for application of the exception test where required

Table 2 of the PPG sets out the requirements for the exception test but does not reflect the need to avoid flood risk from sources other than rivers and the sea. There is no guidance on how to consider other sources of flood risk. The exception test should only be applied, following the application of the sequential test, in the following instances:

- 'Essential infrastructure' in Flood Zone 3a or 3b
- 'Highly vulnerable' development in Flood Zone 2 (this is NOT permitted in Flood Zone 3a or 3b)
- 'More vulnerable' development in Flood Zone 3a (this is NOT permitted in Flood Zone 3b)

While the exception test is not explicitly required for sites at risk from other sources of flooding, Melton Borough Council should follow a similar principle where sites are proposed that are at risk from other sources of flooding, carefully weighing up the wider benefits of development against the risk, ensuring that site users can be kept safe through the lifetime of the development and ensuring residual risk can be safely managed.

For sites proposed for allocation within the Local Plan, the LPA should use the information in this SFRA to inform the exception test. At the planning application stage, the developer must design the site such that it is appropriately flood resistant and resilient in line with the recommendations in national and local planning policy and supporting guidance and those set out in this SFRA. This should demonstrate that the site will still pass the flood risk element of the exception test based on the detailed site level analysis.

There are two parts to demonstrating a development passes the exception test that should be considered by the LPA when allocating development sites, and developers when required:

Part A: Demonstrating that the development would provide wider sustainability benefits to the community that outweigh the flood risk.

The LPA will need to set out the criteria used to assess the exception test and provide clear advice to enable applicants to provide evidence to demonstrate that it has been passed. If the application fails to prove this, the LPA should consider whether the use of planning conditions and / or planning obligations could allow it to pass the exception test. If this is not possible, this part of the exception test has failed, and planning permission should be refused.

Wider sustainability objectives should be considered, such as those set out in the Sustainability Appraisal for the Melton Local Plan Update. These consider matters including air and water quality, biodiversity, economy, equality, historic environment, climate change adaptation, housing, landscape, soil and land, health, and transport.

The sustainability issues the development will address and how far doing so will outweigh the flood risk concerns for the site should also be considered, for example by facilitating wider regeneration of an area, providing community facilities, and having infrastructure that benefits the wider area.

Part B: Demonstrating that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

In circumstances where the potential effects of proposed development are material a Level 2 SFRA is likely to be needed to inform the exception test for strategic allocations to provide evidence that the principle of development can be supported. At the planning application stage, a site-specific FRA will be needed. Both will need to consider the actual and residual risk and how this will be managed over the lifetime of the development.

3.2.6 Making a site safe from flood risk over its lifetime

The LPA will need to consider the actual and residual risk of flooding and how this will be managed over the lifetime of the development:

- Actual risk is the risk to the site considering existing flood mitigation measures.
- The PPG refers to the 'design flood' against which the suitability of a proposed development should be assessed and mitigation measures, if any, are designed.

The 'design flood' is defined as the 1% AEP fluvial event or 1% AEP surface water event, plus an appropriate allowance for climate change. Allowances for climate change can be found in Flood risk assessments: climate change allowances.

- Safe access and egress should be available during the design flood event. Firstly, the design of the development should seek to avoid areas of a site at flood risk. If that is not possible then access routes should be located above the design flood event levels. Where that is not possible, access through shallow and slow flowing water that poses a low flood hazard may be acceptable.
- Residual risk is the risk that remains after the effects of flood defences have been taken into account and/ or from a more severe flood event than the design event. The residual risk can be:
  - A breach of a raised flood defence, blockage of a surface water conveyance system or failure of a pumped drainage system;
  - Failure of a reservoir; and
  - A flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence.

Flood resistance and resilience measures should be considered to manage any residual flood risk by keeping water out of properties and seeking to reduce the damage caused, should water enter a property. Emergency plans should also account for residual risk, such as through the provision of flood warnings and a flood evacuation plans where appropriate.

In line with the NPPF, the impacts of climate change over the lifetime of the development should be taken into account when considering actual and residual flood risk.

Section 8.2.5 discusses requirements for finished floor levels.

3.3 Applying the sequential test and exception test to individual planning applications

3.3.1 Applying the sequential test

MBC, with advice from the EA, are responsible for considering the extent to which sequential test considerations have been satisfied.

Developers are required to apply the sequential test to all development sites, unless the site is:

- A strategic allocation and the test has already been carried out by the LPA as part of preparing the Local Plan, or
- A change of use (except to a caravan, camping or chalet site, or to a mobile home or park home site), or
- A minor development (householder development, small non-residential extensions with a footprint of less than 250m²), or

- A development in fluvial Flood Zone 1 unless there are other flooding issues in the area of the development (such as surface water, groundwater, reservoir or sewer flooding).

It should also be noted that residential sub-divisions are exempt from the definition of minor development and therefore, by default, should also be subject to the sequential test.

The SFRA contains information on all sources of flooding and takes into account the impact of climate change. This should be considered when a developer undertakes the sequential test, including the consideration of reasonably available sites at lower flood risk.

Local circumstances must be used to define geographical scope of the sequential test (within which it is appropriate to identify reasonably available alternatives). To determine the appropriate search area criteria, include the catchment area for the type of development being proposed. For some sites this may be clear, for example school catchments, in other cases it may be identified by other Local Plan policies. For some sites such as regional distribution sites, it may be suitable to widen the search area beyond LPA administrative boundaries. The sources of information on reasonably available sites may include but is not restricted to:

- Site allocations in Local Plans
- Sites with Planning Permission but not yet built out
- Strategic Housing and Economic Land Availability Assessments (SHELAAs)/ five-year land supply/ annual monitoring reports
- Locally listed sites for sale

It may be that a number of smaller sites or part of a larger site at lower flood risk form a suitable alternative to a development site at high flood risk. Ownership or landowner agreement in itself is not acceptable as a reason not to consider alternatives.

3.3.2 Applying the exception test

Where a development proposal is in accordance with an allocation made in a Local Plan following the application of the sequential and exception tests, the exception test will only be required to be repeated if:

- Elements of the development that were key to it satisfying the exception test at the plan-making stage (such as wider sustainability benefits to the community or measures to reduce flood risk overall) have changed or are not included in the proposed development; or
- The understanding of current or future flood risk has changed significantly.

For developments that have not been allocated in the Local Plan or where the sequential test was not applied at the development plan stage and new information becomes available that identifies a flood risk, developers must undertake the sequential and exception tests and present this information to the LPA for approval. The Level 1 SFRA can be used to scope the flooding issues that a site-specific FRA should investigate in more detail to inform the exception test for windfall sites. The applicant will need to provide information that the application can pass both parts of the exception test.

4 Understanding flood risk in Melton borough

This section explores the key sources of flooding in Melton borough and the factors that affect flooding including topography, soils, and geology. The main sources of flooding affecting Melton borough are from watercourses, surface water, and sewers, as detailed in information provided by MBC, the EA, and the relevant water companies.

This is a strategic summary of the risk in Melton borough. Developers should use this section to scope out the flood risk issues they need to consider in greater detail in a site-specific FRA to support a Planning Application.

Appendix B contains a list of the sources of data used in the SFRA and the approach to using hydraulic model data to inform the mapping, while Appendix E contains a summary of flood risk.

4.1 Historical flooding

4.1.1 Historical flood records

As Lead Local Flood Authority (LLFA), Leicestershire County Council (LCC) provided information on historic flood incidents across the Borough, which is summarised in Table 4-1. Table 4-2 details the flood events shown within the EA Recorded Flood Outlines dataset. These are shown in Figure 4-1. The watercourses and areas affected by historic events are detailed further in Appendix E. In addition, the EA's Historic Flood Map (HFM) shows areas of land that have been previously subject to fluvial flooding in the area. This includes flooding from rivers, the sea and groundwater springs but excludes surface water. The HFM outlines for Melton borough are shown in Figure 4-1 alongside the Recorded Flood Outlines (RFO) which also show records of historic flooding from surface water and are included in the MBC's Mapping Portal.

In addition, a request was sent to Parish Councillors and Ward Members to provide any local knowledge held on flood events and issues across the Borough. The information provided is summarised in Table 4-3. While these flood events are captured in the LCC and EA historical data, this local knowledge provides a greater understanding of the mechanisms and impacts of flooding in these areas.

Table 4-1: Historic flooding incidents provided by LCC.

Year	Settlements	Description
2012	Normanton, Frisby on Wreake, Burton Lazars, Goadby Marwood, Somerby, Stathern, Wymondham, Waltham on the Wolds	Highway and internal property flooding from surface water. Including flooding from a culverted ordinary watercourse. One groundwater flooding incident.

Year	Settlements	Description
2013	Long Clawson, Frisby on Wreake, Stonesby, Hose, Plungar, Knossington, Old Dalby	Flooding from surface water runoff and highway flooding caused by issues with a culverted ordinary watercourse.
2015	Melton Mowbray, Asfordby, Redmile	Suspected groundwater flooding in Melton Mowbray and highway flooding caused by blocked gullies and overwhelmed drainage systems.
2016	Long Clawson, Melton Mowbray, Brentingby, Somerby, Sewstern, Edmondthorpe	Multiple highway and garden flooding incidents in Long Clawson, highways flooding in other locations.
2017	Melton Mowbray	Garden flooding incident.
2018	Melton Mowbray, Croxton Kerrial, Branston, Freeby	Highway flooding caused by drainage issues and blocked gullies.
2023 (Storm Babet)	Long Clawson, Redmile, Frisby, Waltham, Sewstern	Four reported incidents of internal property flooding and five reported incidents of external property flooding.
2023-2024 (Storm Henk)	Asfordby, Frisby on Wreake, Great Dalby, Melton Mowbray, Long Clawson, Somerby, Redmile, Wymondham, Twyford	80 reported flooding incidents (internal and external), settlements with the highest number of incidents were Frisby on Wreake, Somerby, and Melton Mowbray. Lakes in Melton Country Park overtopped blocking commonly used footpaths.

Table 4-2: Historic flooding incidents shown in the EA Recorded Flood Outlines dataset.

Flood date	Flood source	Flood cause	Areas affected
January 1977	River Wreake	Channel capacity exceedance	Fluvial flooding of the River Wreake and River Eye. Affected areas include Melton Mowbray.
February 1977	River Devon	Channel capacity exceedance	Fluvial flooding of the River Devon. Affected areas include Knipton, Muston and Bottesford.
April 1978	River Wreake	Channel capacity exceedance	Fluvial flooding of the River Wreake and River Eye. Affected areas include Melton Mowbray and locations downstream.
January 1979	Main River	Channel capacity exceedance	Multiple locations.
October 2000	River Wreake	Channel capacity exceedance	Fluvial flooding of the River Wreake and River Eye. Affected areas include Melton Mowbray.
July 2001	River Devon	Channel capacity exceedance	Fluvial flooding of the River Devon. Affected areas include Knipton, Muston and Bottesford.

Table 4-3: Historic flooding incidents provided by Parish Councillors and Ward Members

Flood date	Flood source	Areas affected
January 2024 (Storm Henk) most recently, plus other occasions of heavy rainfall	Surface water	Wymondham in the south-west of Melton borough. Runoff from the surrounding fields flowed onto and blocked the western and central parts of Main Street, and along the adjoining Sycamore Lane and Spring Lane. Surface water also flooded the village green and the three properties located here, plus the cellars of properties located along Main Street between the 'Old Bakery Antiques' shop and the 'Berkeley Arms' pub. Watercourses have become blocked by vegetation and/or debris such as a culvert in Wymondham which runs from the north to Main Street and under Sycamore Lane, and the Wash Brook on Main Street on the east side of Wymondham village.

Flood date	Flood source	Areas affected
Multiple (during heavy rainfall events)	Fluvial (main river)	Garthorpe in the east of Melton borough. The River Eye overtops and water flows northwards across Wymondham Road, flooding the row of terraced houses here. In the village of Coston, approximately 2km along the road to the north-east, the River Eye floods the B676 during periods of intense rainfall, making it impassable. The ford on Coston Road also frequently becomes impassable, meaning a detour is required to access the village of Sproxton to the north.
Multiple (during heavy rainfall events)	Fluvial (ordinary watercourse)	Saxelby in the west of Melton borough. During periods of intense rainfall, the watercourse flowing north-eastwards overtops and floods Church Lane near the new house development.
Multiple (during heavy rainfall events)	Surface water	Melton Mowbray in the centre of Melton borough. Surface water during periods of heavy rainfall affecting the southern end of Melton Spinney Road to the north-west of the town, Saxby Road to the east, Dalby road to the south and Scalford Road to the north.
February 2020 (Storm Dennis), July 2001	Fluvial (ordinary watercourse and main river) and surface water	Bottesford in the northern point of Melton borough. In February 2020, the drainage ditch along Belvoir Road overflowed after a period of heavy rainfall, flooding the road and gardens of nearby properties. Grantham canal overtopped, contributing water to the River Devon and Winter Beck. The bank of Winter Beck, between Belvoir Road and Barkestone Lane, collapsed causing the footpath to erode away. Three properties on Nottingham Road flooded as well as Rectory Lane near St Mary's and a garden on Bowbridge Gardens. In Muston, to the south-east of Bottesford, the River Devon overtopped, flooding the churchyard and gardens of one property and 'The Old Forge Tea Rooms'. In July 2001, flooding occurred across Bottesford, Easthorpe, Normanton and Muston, including on Church Lane, Rectory/Devon Lane, Bottesford High Street, Belvoir Road, Grantham Road, Normanton Lane, Albert Street and Station Lane.

4.1.2 Flood Investigations

Under the Flood and Water Management Act (2010), the Lead Local Flood Authority (LLFA) has a duty to investigate flood incidents, where considered necessary or appropriate and produce a report. Flood investigation reports produced by Leicestershire County Council as LLFA can be viewed on their Flood Risk Management webpage.

There is one report which covers an area within Melton borough: Redmile - Final October 2021 report. This details a flood event in February 2020 which caused internal flooding of five residential properties in Redmile Village, in the north of Melton borough. This was primarily due to 28.2mm of rainfall within a 12hour period onto an already saturated catchment. One area was impacted by an ordinary watercourse becoming overwhelmed, resulting in water flowing onto the highway then breaching the low thresholds resulting in internal flooding of two of the five properties. The other three properties in a different area were affected by a combination of overland surface water and an overwhelmed ordinary watercourse.

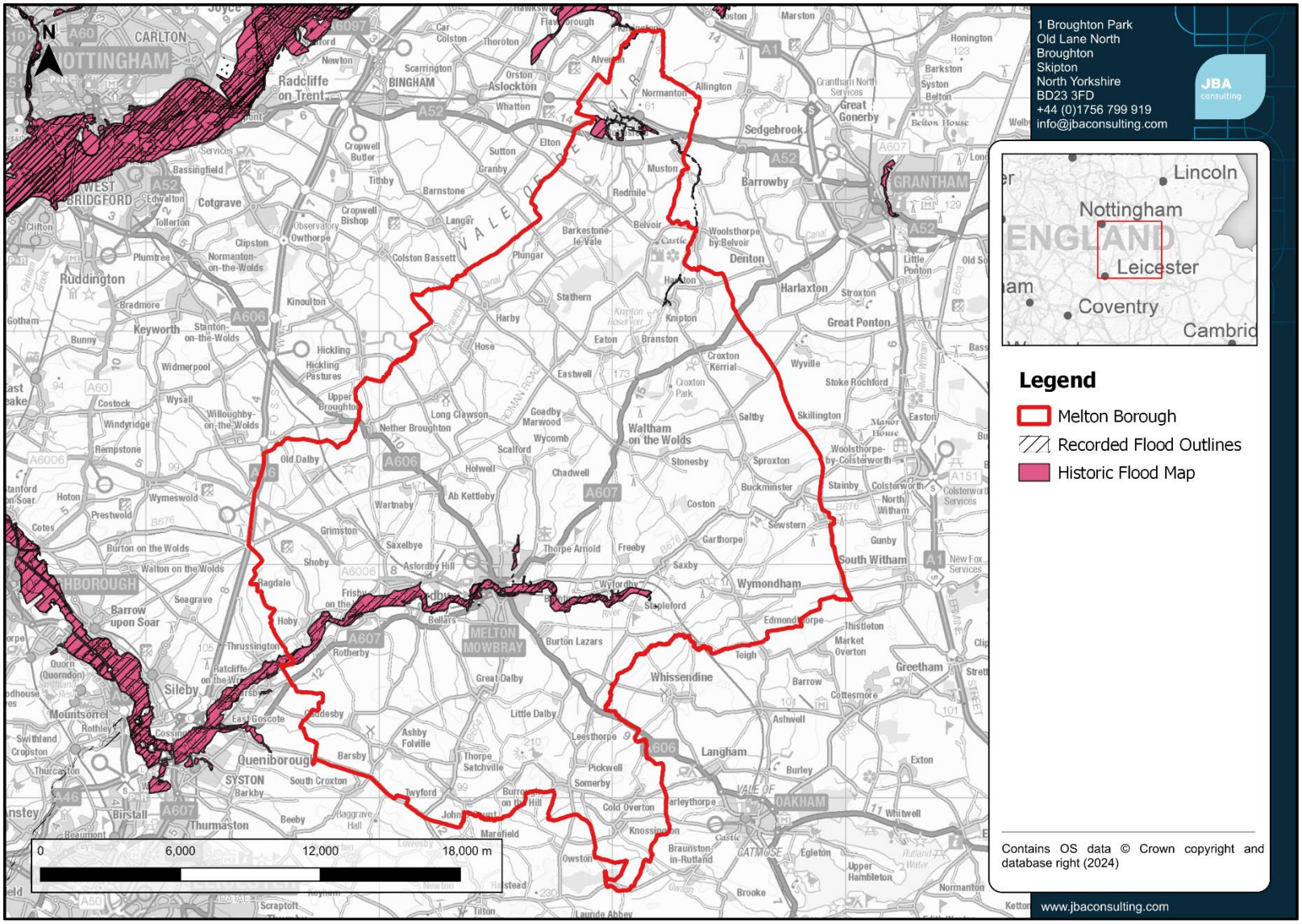


Figure 4-1: Historic Flood Map and Recorded Flood Outlines across Melton borough

4.2 Topography, geology, soils, and hydrology

The topography, geology and soil are all important in influencing the way the catchment responds to a rainfall event. The degree to which a material allows water to percolate through it, the permeability, affects the extent of overland flow and therefore the amount of run-off reaching the watercourse. Steep slopes or clay rich (low permeability) soils will promote rapid surface runoff, whereas more permeable rock such as limestone and sandstone may result in a more subdued response.

4.2.1 Topography

Figure 4-2 shows how the topography of Melton borough is characterised by a gently undulating landscape comprised of fertile farmland, interspersed with woodlands and hedgerows. The region features a network of river valleys, with the River Wreake being a prominent feature. Towards the northeast, the terrain becomes more varied as it transitions into the Vale of Belvoir. The western part of the Borough, closer to Leicester, exhibits a flatter topography, with a mix of residential and industrial areas. Burrough Hill in the south of the Borough is identified as the highest point, reaching an elevation of approximately 210 mAOD.

4.2.2 Geology

Information on the bedrock and superficial geology in the Borough can be viewed online in the British Geology Society Geology Viewer. Bedrock geology of the study area is displayed in Figure 4-3.

In the majority of Melton borough bedrock geology is primarily comprised of Lias Group sedimentary rocks that predominately date back to the Early Jurassic period, approximately 201 to 174 million years ago. The Lias Group has mixed permeability characteristics as it is composed of alternating layers of limestone, shale, and clay.

In the East of the catchment there is a pocket of Inferior Oolite group bedrock geology around Waltham on the Wolds, Saltby, and Croxton Kerrial. The Inferior Oolite dates back to the Middle Jurassic period roughly 174 to 163 million years ago, it consists of limestone, characterised by small spherical grains called ooids. This is a lot more permeable than the Lias group which dominates the rest of the catchment.

In the West of the catchment there is a small area of Undifferentiated Triassic bedrock geology around Brooksby. This formation is composed of sedimentary rocks deposited during the Triassic period, which occurred approximately 251 to 201 million years ago. It lacks clear stratigraphic boundaries or specific lithological characteristics. Instead, it represents a mixture of sedimentary deposits that are difficult to differentiate. This makes estimating the areas permeability and structural condition difficult without understanding the complex heterogenous geological formation present.

The EA also provides mapping of different types of aquifers, the underground layers of water-bearing permeable rock from which groundwater can be extracted. Aquifers are

designated as either principal or secondary aquifers. Principal aquifers are designated by the EA as strategically important rock units that have high permeability and water storage capacity. In the study area, there is an area where aquifer designation is principal, this is in the east of Melton, from Waltham on the Wolds to the Borough boundary. The aquifer designation for majority of the rest of the study area is either secondary A, secondary B or undifferentiated secondary, aside from some unproductive areas which are found in the south and southeast and to the north of the River Wreake. The aquifer designations across the study area for bedrock geology are shown in Figure 4-4.

4.2.3 Soils

Soils in the northern region of Melton borough are comprised of base-rich, freely draining soils, with some shallow lime-rich soils which are also freely draining, with more lime-rich loamy and clayey soils present in the valleys in the west. In the east of Melton borough, shallow lime rich soils over chalk or limestone are present. These more lime rich soils tend to impede drainage surfaces. Towards the south of the Borough, soils are primarily comprised of base-rich, loamy and clayey soils that are seasonally wet. Where soils are slowly draining with reduced permeability, this may impact infiltration.

Soils data across the study area can be accessed through the British Geological Survey website.

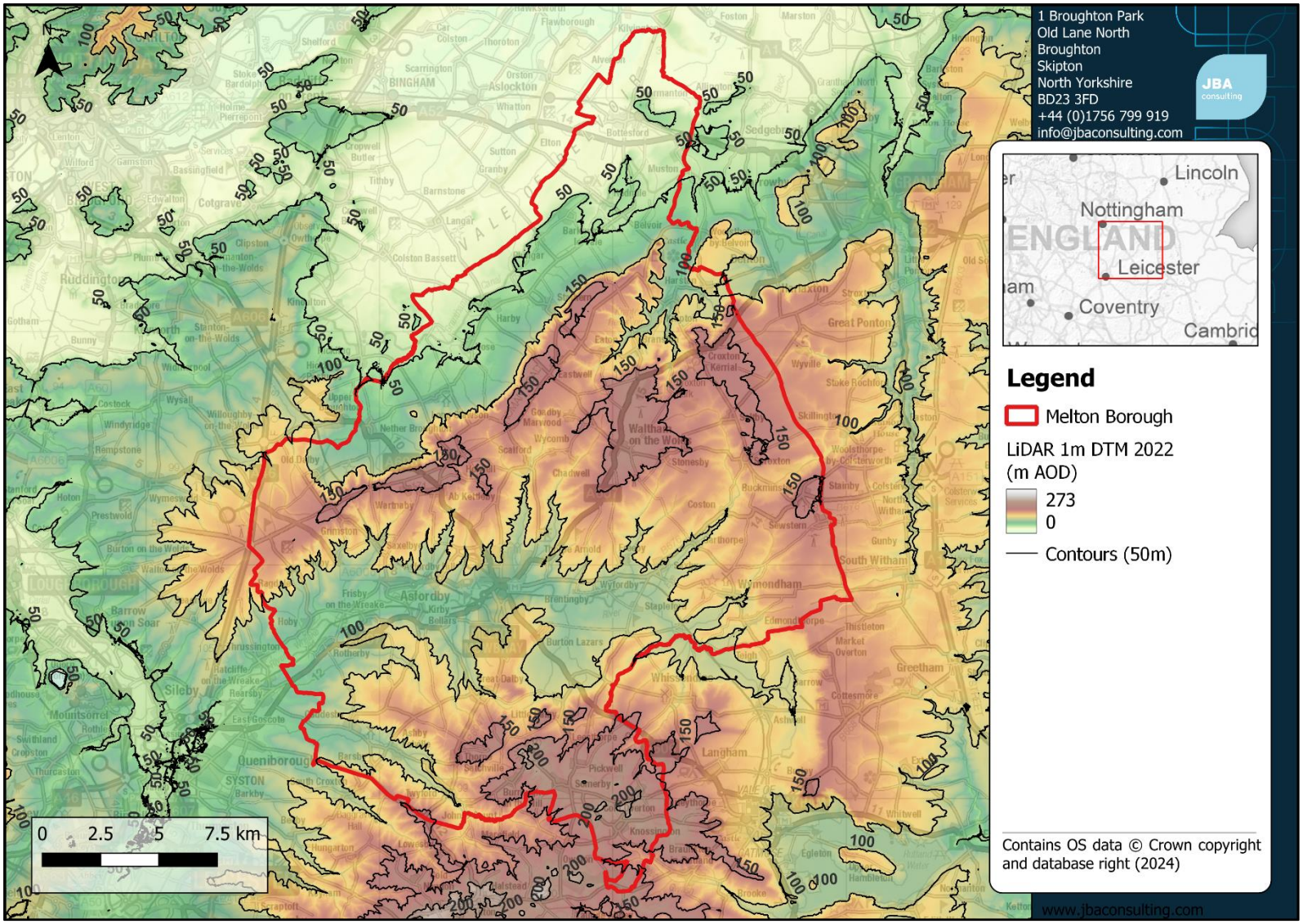


Figure 4-2: Topography across Melton borough

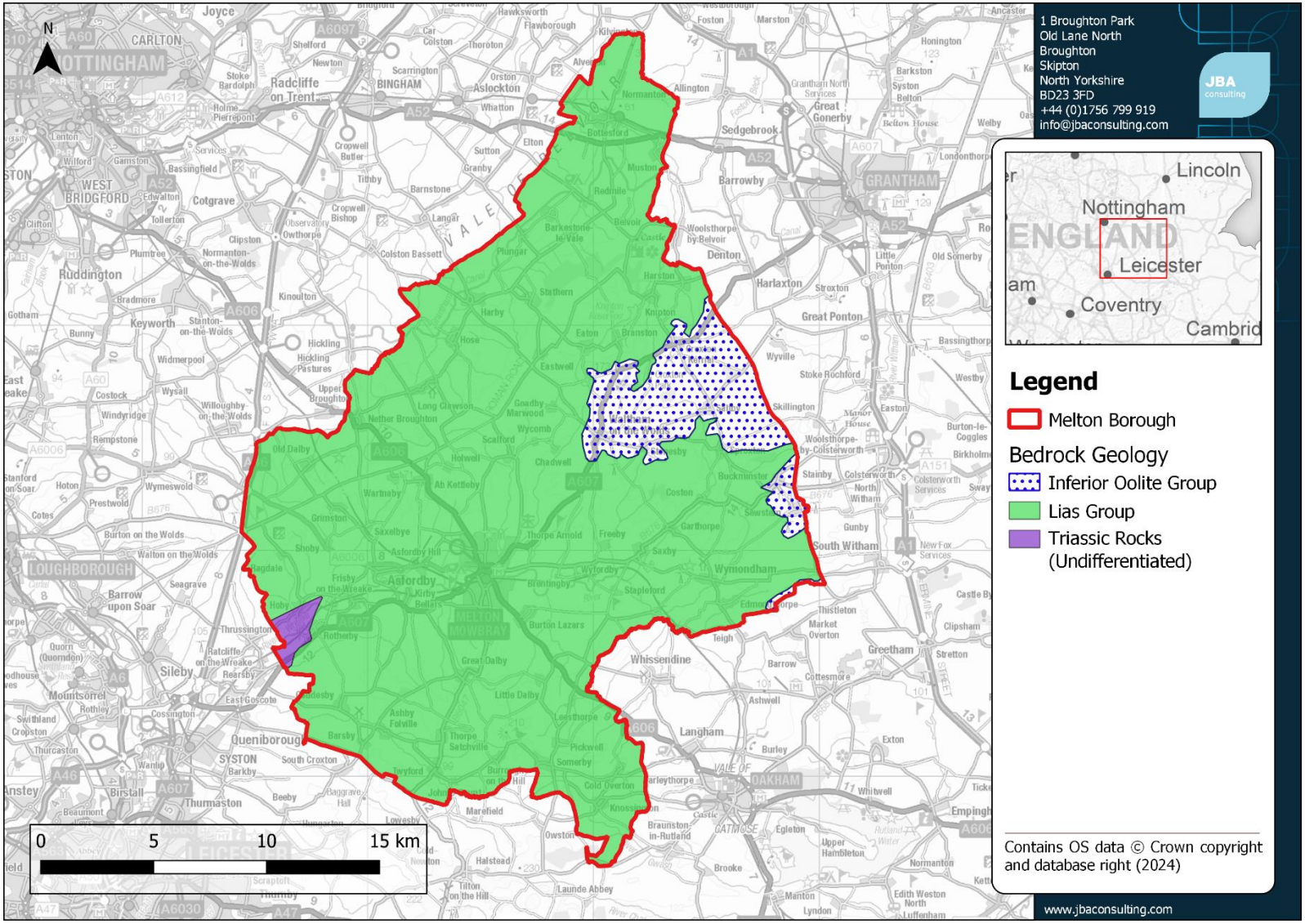


Figure 4-3: Bedrock geology across Melton

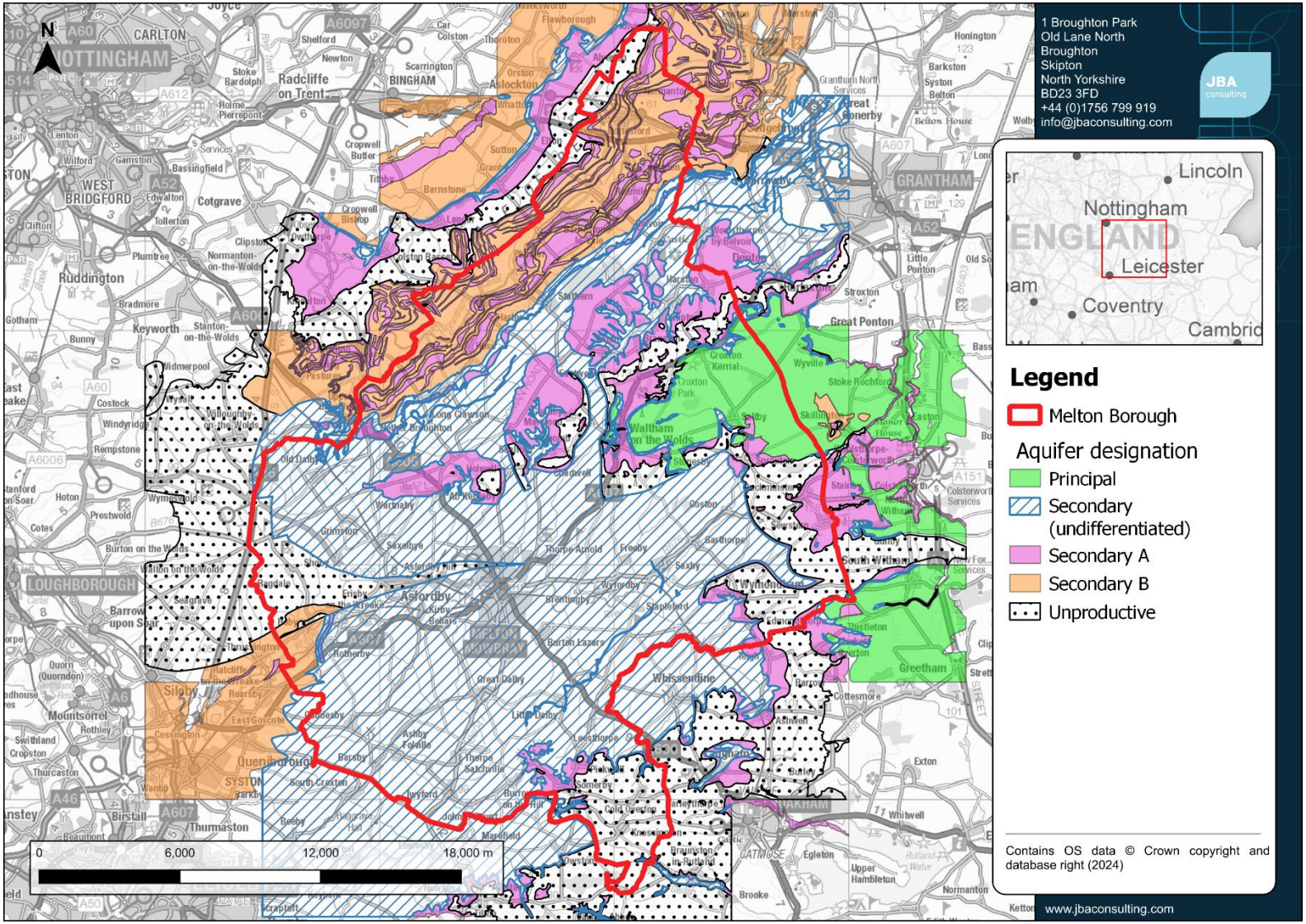


Figure 4-4: Bedrock aquifer designations across Melton borough

4.3 Fluvial flood risk

The major watercourses flowing through the Melton borough are:

- Asfordby Relief Channel
- Edendale Brook
- Gaddesby Brook
- River Devon
- River Eye
- River Wreake
- Scalford Brook
- Thorpe Brook; and
- Welby Brook.

Tributaries of these watercourses include smaller ordinary watercourses and numerous unnamed drains. There are also several ponds and lakes within the study area. A map of the key watercourses is included in Figure 1-3 and on MBC's Mapping Portal.

The primary fluvial flood risk in Melton borough is from rivers running through more developed areas and areas of lower elevation such as the River Eye and River Wreake flowing through Wyfordby, Melton Mowbray and Asfordby, Gaddesby Brook flowing through Twyford, Ashby Folville and Gaddesby, and the River Devon flowing through Branston, Knipton and Bottesford.

The Flood Zone maps for the Melton borough are provided in the MBC's Mapping Portal, split into Flood Zones 2, 3a, and 3b. Section 3.2.1 describes how the fluvial Flood Zones have been derived for this SFRA. The flood risk associated with the major locations in the Borough are detailed in Appendix E.

4.4 Surface water flooding

Surface water runoff is most likely to be caused by intense downpours. At times the amount of rainfall can completely overwhelm the drainage network, which is not designed to cope with extreme storms. The flooding can also be complicated by blockages to drainage networks, sewers being at capacity and/ or high-water levels in watercourses that cause local drainage networks to back up.

The EA Risk of Flooding from Surface Water mapping (RoFSW) highlights several communities in Melton borough at risk from surface water flooding. Surface water flow paths generally follow the topography of existing watercourses, although there are some areas at risk from isolated ponding. Additionally, surface water flow routes are also established on roads in more built-up areas within the Borough, highlighting risk to transport networks while posing a risk to buildings which water can be routed to. The RoFSW mapping for the Melton borough can be found in the MBC's Mapping Portal.

4.5 Sewer flooding

Sewer flooding occurs when intense rainfall/river flooding overloads sewer capacity (surface water, foul or combined), and/or when sewers cannot discharge to watercourses due to high water levels.

Sewer flooding can also be caused by blockages, collapses, equipment failure or groundwater leaking into sewer pipes.

Since 1980, the Sewers for Adoption guidelines mean that new surface water sewers have been designed to have minimum capacity for a 3.3% AEP rainfall event, although until recently this did not apply to smaller private systems. This means that sewers can be overwhelmed in larger rainfall and flood events.

New developments should not cause additional pressures on existing sewers due to the requirements to maintain greenfield runoff rates. However, increases in rainfall as a result of climate change can lead to existing sewers reaching capacity. This can be reduced through the use of well-designed SuDS to reduce surface water runoff.

Severn Trent Water is the main water company responsible for the management of the sewer networks across Melton borough, while Anglian Water is responsible for small areas of Melton borough including Normanton in the north, Knossington in the south, and parts of Harston, Croxton Kerrial, Saltby, Sproxton, Buckminster, Sewstern and Wymondham at the eastern boundary. Data from Anglian Water was not available at the time of publication. Severn Trent Water provided a record of flooding incidents within the Borough relating to public foul, combined or surface water sewers from January 1990 until April 2024. Table 4-3 below display this data using truncated postcodes to avoid identifying specific streets or properties.

Table 4-4: Sewer flooding incidents recorded by Severn Trent Water (January 1990 - April 2024)

Postcode	Total flooding incidents	Area covered by postcode
LE13 0	**22**	Western and southern areas of Melton Mowbray
LE13 1	**37**	Northern and eastern areas of Melton Mowbray
LE14 2	**7**	A southern area of Melton borough including villages such as Frisby on the Wreake, Great Dalby, Burrough on the Hill and Wymondham
LE14 3	**43**	Area to the west and northwest of Melton Mowbray including villages of Asfordby, Grimston, Ab Kettleby, Upper Broughton and Hickling
LE14 4	**53**	Area to the north and east of Melton Mowbray including villages of Brentingby, Sproxton, Waltham on the Wolds, Long Clawson and Harby

Postcode	Total flooding incidents	Area covered by postcode
LE15 7	**1**	A small part of the southern-most point of Melton borough including the village of Cold Overton. The rest of this postcode area is located outside the Borough
NG13 0	**12**	The northern-most area of Melton borough including villages of Normanton, Bottesford, Redmile and Plungar

4.6 Groundwater flooding

In general, less is known about groundwater flooding than other sources and availability of data is limited. Groundwater flooding can be caused by:

- High water tables, influenced by the type of bedrock and superficial geology.
- Seasonal flows in dry valleys, which are particularly common in areas of chalk geology.
- Rebounding groundwater levels, where these have been historically lowered for industrial or mining purposes.
- Where there are long culverts that prevent water easily getting into watercourses.
- Perched aquifers underlain by impermeable geology, particularly in low lying areas.

Groundwater flooding is different to other types of flooding. It can last for days, weeks, or even months and is much harder to predict and warn for. Monitoring does occur in certain areas, for example where there are major aquifers or when mining stops.

LCC's Assessment of Local Flood Risk (2024) states that groundwater flood risk across Leicestershire is comparatively low with minimal reports of groundwater flooding. From the data provided by Parish Councillors and Ward Members, groundwater flooding was only reported in one of the villages. Groundwater flooding was reported to occur in Bottesford after periods of heavy rainfall, at a proposed development site north of the village.

Two datasets were used to assess potential areas that are likely to be at higher risk of groundwater flooding:

- The EA's Areas Susceptible to Groundwater Flooding (AStGWF) dataset, showing the degree to which areas are susceptible to groundwater flooding based on geological and hydrogeological conditions. It does not show the likelihood of groundwater flooding occurring; it is a hazard, not risk, based dataset.
- The JBA Groundwater Emergence map, showing the likelihood of groundwater emergence posing a risk to both surface and subsurface assets, based on predicted groundwater levels. This divides groundwater emergence into five categories:

- Groundwater levels are either at or very near (within 0.025m of) the ground surface. Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots.
- Groundwater levels are between 0.025m and 0.5m below the ground surface. Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally.
- Groundwater levels are between 0.5m and 5m below the ground surface. There is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely.
- Groundwater levels are at least 5m below the ground surface. Flooding from groundwater is not likely.
- No risk. This zone is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.

In this SFRA, a three-stage approach has been adopted to assess the risk of groundwater flooding:

- Firstly, the AStGWF dataset was used to identify grid squares that are most susceptible to groundwater flooding. Based on this dataset, any areas with greater than 50% susceptibility to groundwater flooding were taken forward for further analysis. This resulted in 69 out of 511 grid squares across Melton borough being taken forward, which were generally located near the Rivers Devon, River Wreake, and River Eye.
- Of the areas identified in the above, the JBA groundwater emergence map was used to locate areas where this groundwater is most likely to emerge. For this assessment, areas where groundwater levels are predicted to be within 0.5m of the surface level were identified.
- Upon identifying likely areas of groundwater emergence, the 0.1% AEP surface water extent from the EA's RoFSW map was used to identify where any groundwater emerging in these locations is most likely to flow.

The results of this assessment are summarised in Appendix E. It should be noted that this assessment only identifies areas likely to be at risk of groundwater emergence and where this water might flow. It does not predict the likelihood of groundwater emerging or attempt to quantify the volumes of groundwater that might be expected to emerge in a given area.

The EA's AStGWF dataset for Melton borough is shown on MBC's Mapping Portal (see Appendix A for more information). In high-risk areas, a site-specific risk assessment for groundwater flooding may be required to fully inform the likelihood of flooding.

4.7 Flooding from canals

Canals are regulated waterbodies and are unlikely to flood unless there is a sudden failure of an embankment or a sudden ingress of water from a river in areas where they interact closely. Embankment failure can be caused by:

- Culvert collapse
- Overtopping
- Animal burrowing
- Subsidence/ sudden failure, for example collapse of former mine workings
- Utility or development works close or encroaching onto the footings of a canal embankment.

Flooding from a breach of a canal embankment is largely dictated by canal and ground levels, canal embankment construction, breach characteristics and the volume of water within the canal that can discharge into the lower lying areas behind the embankment. The volume of water released during a breach is dependent on the pound length (the distance between locks) and how quickly the operating authorities can react to prevent further water loss, for example by the fitting of stop boards to restrict the length of the canal that can empty through the breach, or repair of the breach. The Canal and River Trust monitor embankments at the highest risk of failure.

There is one canal in the Melton borough. This is the Grantham Canal which flows through the north of the Borough as displayed in Figure 4-5. The canal originates in Grantham, Lincolnshire and continues westwards towards the River Trent near Nottingham. Within Melton, the Grantham Canal enters the Borough by Hose flowing through Harby, Plungar, Barkestone and Redmile, before exiting the Borough east of Muston Meadows National Nature Park. The Grantham Canal was closed to navigation in 1936. However, a two-foot water level was to be maintained to support agricultural needs and over time, it has become a valuable wildlife habitat.

The Canal and River Trust were consulted to identify any instances of breaches and overtopping of the canal. The data provided showed 21 recorded overtopping incidents along the Grantham Canal, 12 of which were west of Hose between Canal Lane and Meadows Lane. Three recorded breaches occurred along the Grantham Canal in the Borough, between Canal Lane and Meadows Lane west of Hose, and west of Redmile.

The canal has the potential to interact with other watercourses in the Borough. These have the potential to become flow paths if the canal was overtopped or breached. Any development proposed adjacent to a canal should include a detailed assessment of how a canal breach would impact the site, as part of a site-specific Flood Risk Assessment. Guidance on development near canals is available on the Canal and River Trust webpage titled Is the development appropriate?.

There are also remnants of the 16-mile Oakham Canal which runs through the centre of Melton Mowbray, eastwards, through a few small villages and out of Melton borough at Edmondthorpe. This canal was originally used commercially but was closed in 1847 and converted to a railway line. The canal has been filled in except for a few sections used for

fishing. There is also the Melton Mowbray Navigation which is a 3-mile section of the lower River Eye and the upper River Wreake, stretching south-westwards from the west of Melton Mowbray to the north-west of Syston. This historically served as a navigation route but was closed in 1877 and is now used as a recreational waterway, with many of the locks converted to weirs for flood control.

Canal restoration is part of MBC's Corporate Strategy due to the wider opportunities it presents as part of 'maximising investment in our waterways, canals, walkways and green infrastructure'. Local canal trusts in Melton borough have plans to restore navigation routes along parts of the Oakham Canal, the Melton Mowbray Navigation and the Grantham Canal. Upon any changes to the canal network in Melton borough, the impacts on flood risk will need to be assessed and the Local Plan updated.

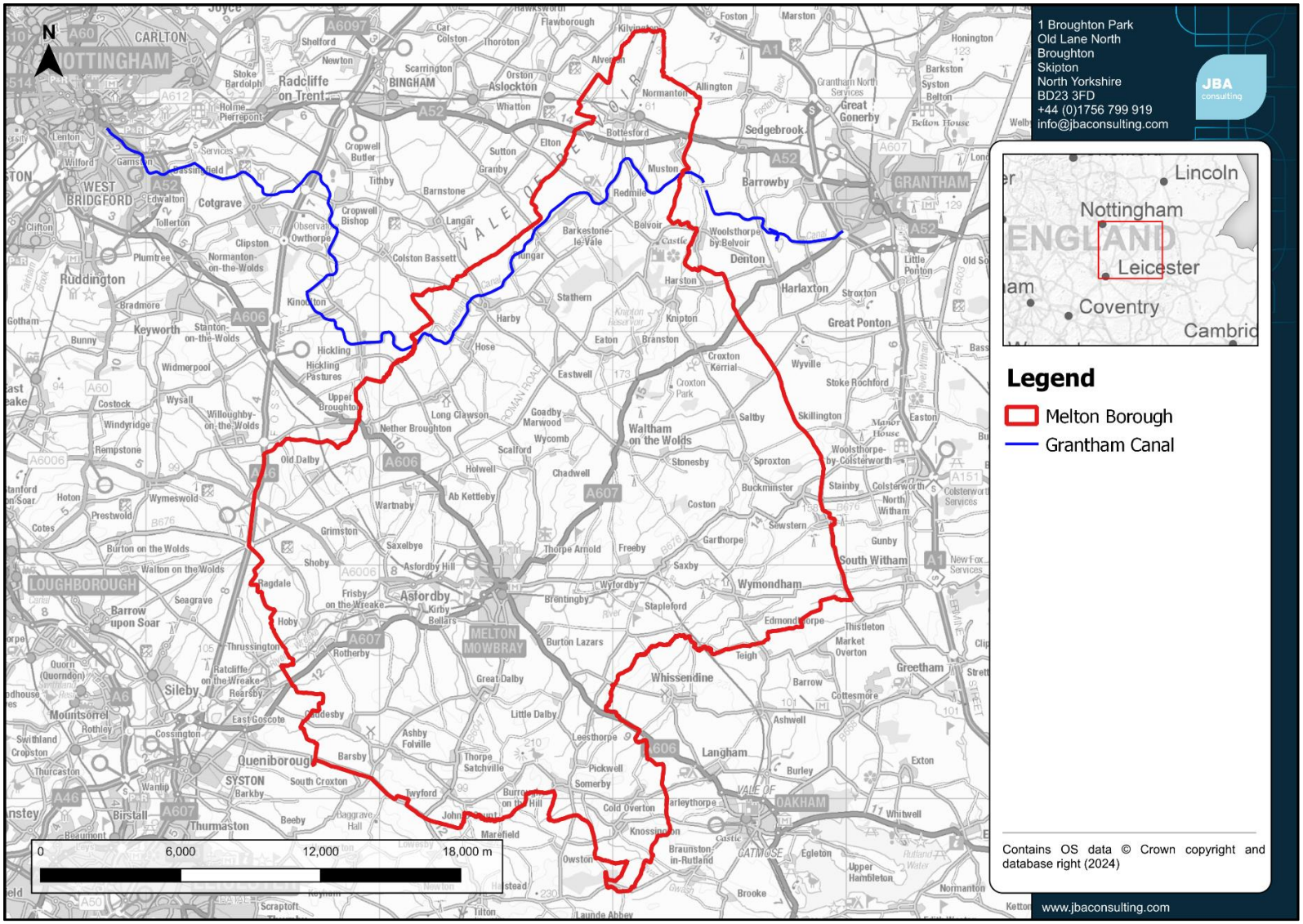


Figure 4-5: Canals in Melton borough

4.8 Flooding from reservoirs

Reservoirs with an impounded volume greater than 25,000 cubic metres are governed by the Reservoirs Act 1975, and are on a register held by the EA. The level and standard of inspection and maintenance required by a Supervising Panel of Engineers under the Act means that the risk of flooding from reservoirs is very low. Some reservoirs are designated as high risk by the EA, where an uncontrolled release of water could put people's lives at risk and are subject to increased inspection and maintenance requirements. However, this designation does not mean they are at a high risk of flooding.

Flooding from reservoirs occurs following partial or complete failure of the control structure designed to retain water in the artificial storage area. Reservoir flooding is very different from other forms of flooding; it may happen with little, or no warning and evacuation will need to happen immediately. The likelihood of such flooding is difficult to estimate but is extremely low compared to flooding from other sources. It may not be possible to seek refuge upstairs from floodwater as buildings could be unsafe or unstable due to the force of water from the reservoir breach or failure.

The EA hold mapping showing what might happen if reservoirs fail. Developers and planners should Check the long-term risk of flooding for an area in England before using the reservoir data shown in this SFRA to make sure they are using the most up to date mapping. The EA provide two flooding scenarios for the reservoir flood maps: a ‘dry-day’ and a ‘wet-day’. The ‘dry day’ scenario shows the predicted flooding which would occur if the dam or reservoir fails when rivers are at normal levels. The ‘wet day’ scenario shows the predicted worsening of the flooding which would be expected if a river is already experiencing an extreme natural flood. It should be noted that these datasets give no indication of the likelihood or probability of reservoir flooding.

The current mapping shows that there are eight reservoirs located within Melton borough, detailed in Table 4-5, with their locations shown in Figure 4-6. Section 8.4.3 provides further considerations for developing in the vicinity of reservoirs. The reservoir flood mapping for both the ‘dry day’ and ‘wet day’ scenarios in Melton borough can be viewed on MBC's Mapping Portal and is displayed in Figure 4-6. The EA maps represent a credible worst-case scenario. In these circumstances it is the time to inundation, the depth of inundation, the duration of flooding and the velocity of flood flows that will be most influential.

Table 4-5: Reservoirs within Melton borough.

Reservoir	Easting and Northing	Reservoir owner	Risk Category	Category	Year built	Local Authority
Belvoir Lower Lake	483148, 333229	The Belvoir Estate	High	Unknown	Circa 1799	Melton borough
Belvoir Upper Lake	483009, 332835	The Belvoir Estate	High	Unknown	Circa 1799	Melton borough
Brentingby Flood Storage Reservoir	477447, 318751	EA	High	Unknown	2001	Melton borough
Frisby Lake	469200, 318200	EA	High	Unknown	Not Known	Melton borough
Knipton Reservoir	481750, 330650	Canal and River Trust	High	Unknown	1790	Melton borough
Ragdale	465500, 320900	Severn Trent water	High	Unknown	Not Known	Melton borough
Scalford Reservoir	475800, 320700	EA	High	Unknown	1990	Melton borough
Stapleford Lake	481700, 318200	Trustees of Lady Grettton's 1922 Settlement	Not high Risk	Unknown	Not Known	Melton borough

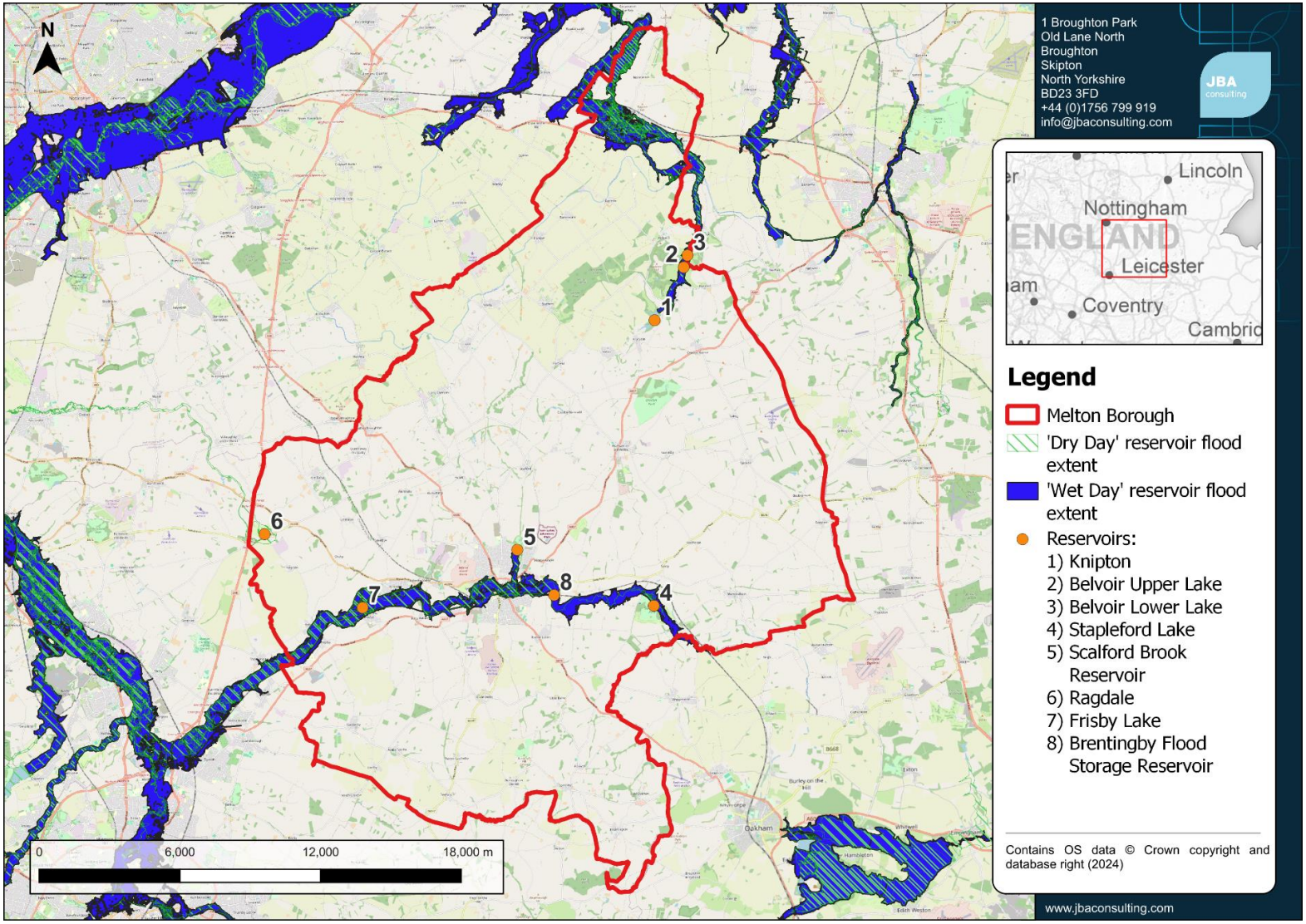


Figure 4-6: Reservoir flooding and location of reservoirs within Melton borough

The risk of reservoir flooding is extremely low, however, there remains a residual risk to development from reservoirs which developers should consider during the planning stage.

- Developers should seek to contact the reservoir owner to obtain information which may include:
  - Reservoir characteristics: type, dam height at outlet, area/volume, overflow location.
  - Operation: discharge rates/maximum discharge.
  - Discharge during emergency drawdown.
  - Inspection/maintenance regime.
- Developers should apply the sequential approach to locating development within the site.
- Consult with relevant authorities regarding emergency plans in case of reservoir breach.
- The reservoir owners are contacted to confirm the Reservoir Risk Designation (if determined) and the inspection and maintenance regime of the reservoir.
- Consider the impact of a breach and overtopping, particularly for sites proposed to be located immediately downstream of a reservoir. This should consider whether there is sufficient time to respond.
- It should also be understood that the “risk category” of a reservoir is set by the potential damage and loss of life in circumstances where there is a breach or an extreme flood event. Accordingly, it is possible that allocation of new development downstream of an existing reservoir could potentially change the risk category and result in a legal requirement (under the Reservoirs Act 1975) to improve the structural and hydraulic capacity of the dam. As the cost of implementing such works can be substantial consideration should be given to considering the implications and whether it would be more appropriate to place development in alternative locations not associated with such risk.
- The EA online Reservoir Flood Maps contain information on the extents following a reservoir breach (note: flood extents are not included for smaller reservoirs or for reservoirs commissioned after the reservoir modelling programme began in October 2016). For proposed sites located within the extents, consideration should be given to the extents shown in these online maps.
- In addition to the risk of inundation, those considering development in areas affected by breach events should also assess the potential hydraulic forces imposed by the rapid flood event and check that that the proposed infrastructure fabric can withstand the loads imposed on the structures by a breach event.

4.9 Flood alerts and flood warnings

The EA is the lead organisation for providing warnings of river flooding. Flood Warnings are supplied via the Flood Warning System (FWS) service, to homes and business within Flood Zones 2 and 3.

There are currently three Flood Alert Areas (FAA) and six Flood Warning Areas (FWAs) covering Melton borough. Flood Alerts are issued when there is water out of bank for the first time anywhere in the catchment, signalling that 'flooding is possible', and therefore FAAs usually cover the majority of main river reaches. Flood Warnings are issued to designated FWAs which include properties within the extreme flood extent which are at risk of flooding when the river level hits a certain threshold; this is correlated between the FWA and the gauge, with a lead time to warn that 'flooding is expected'.

The FAAs and FWAs are listed in Appendix D and included on MBC's Mapping Portal.

4.10 Summary of flood risk in Melton borough

A table summarising all sources of flood risk to key settlements in Melton borough can be found in Appendix E. For this summary, the Borough has been delineated into four areas based on major watercourses and ward boundaries. These are shown in Figure 4-7. Appendix E provides an overview of flood risk for each area, and a summary of the findings from Appendix E is provided below.

4.10.1 Area 1 (Northern area of Melton borough).

- This area is largely rural, with the Rivers Devon and Smite, and the Winter Beck in more populated areas, with associated Flood Zones. There are no formal defences but there is natural and engineered high ground around the watercourses.
- The area is most affected in the 1% AEP and 0.1% AEP surface water events, particularly in areas of habitation and roads.
- In both the Wet Day and Dry Day scenarios for reservoir flooding, Belvoir Lower and Upper Lakes (The Belvoir Estate) and Knipton (Canal and River Trust) affect the area.
- In the area there this a 50% susceptibility to groundwater emergence with Bottesford and Easthorpe experiencing susceptibility of greater than 75% in accordance with the AStGWF dataset. The JBA Groundwater Emergence mapping shows that areas of highest risk (with ground water levels less than 0.025m below the surface) include the aforementioned areas in addition to Long Clawson and Stathern.
- Data provided by the EA highlight four historic flood events, data provided by LCC show sixteen recorded flood events, and data from the Canal and River Trust show three canal breaches and 21 canal overtopping events.

4.10.2 Area 2 (Eastern area of Melton borough).

- This area is largely rural, the River Eye is the predominant river within this area with Flood Zones 2 and 3 along most watercourses in the area, Flood Zones 2 and 3 affect the settlements, particularly Wymondham and Coston.
- There are flood defences in the form of embankments and flood walls along the River Eye, additionally there is natural and engineered high ground however these are not formal defences.
- The area is most affected by the 1% AEP and 0.1% AEP events, however the majority of the surface water extents affect uninhabited areas.
- In both the 'Dry Day' and 'Wet Day' scenarios for reservoir flooding, Area 2 is affected by the Brentingby Flood Storage Reservoir (Environment Agency) and Stapleford Lake (Trustees of Lady Gretton's 1992 Settlement).
- The area is predominantly at less than 25% susceptibility to groundwater flooding, with some areas, particularly near settlements, with a susceptibility greater than 75%. JBA groundwater emergence mapping shows that groundwater levels are less than 0.5m below the ground surface in the northern part of the area otherwise levels are below 5m of the surface.
- Data provided by the EA highlight four recorded flood events, data from LCC detail eight recorded flood events, and data from the Canal and River Trust show no canal breaches or overtopping events.

4.10.3 Area 3 (Western and central area of Melton borough).

- The area is largely rural, with the River Eye and River Wreake within Melton Mowbray and other smaller settlements, with multiple confluences within the settlements themselves. Flood Zones 2 and 3 predominantly affect the inhabited areas of Melton Bowbary and smaller towns.
- There are multiple formal defences within Melton Mowbray and surrounding settlements which include flood defence walls, embankments and spill ways. There is also natural and engineered high ground along the banks of the watercourses, however these are not formal flood defences.
- The area is affected by the 3.3%, 1%, and 0.1% AEP surface water events, particularly in Melton Mowbray.
- In the 'Dry Day' scenario for reservoir flooding, extents from Brentingby Flood Storage Reservoir (Environment Agency), Scalford Brook Reservoir (Environment Agency), Frisby Lake (Environment Agency), Ragdale (Severn Trent Water), and Stapleford Lake (Trustees for Lady Gretton's 1992 settlement) are present within the area. In the 'Wet Day' scenario extents from Brentingby Flood Storage Reservoir (Environment Agency), Scalford Brook Reservoir (Environment Agency), and Stapleford Lake (Trustees for Lady Gretton's 1992 settlement).

- The majority of the area has less than 25% susceptibility to groundwater flood risk, however there is greater than 50% susceptibility within Melton Mowbray.
- The groundwater emergence mapping shows that the majority of the area has ground water levels below 5m of the ground surface, with groundwater levels around the Rivers Eye and Wreake within 0.5m or less than 0.025m of the ground surface, particularly within Melton Mowbray.
- Data provided by the EA show there are four recorded flood events, records provided by LLC show 14 recorded flood events, and data from the Canal and River Trust show no recorded overtopping or breach events.

4.10.4 Area 4 (Southern area of Melton borough).

- This area is largely rural, with the River Gwash and the Gaddesby Brook, with Flood Zones 2 and 3 affecting Twyford, Ashby Folville and Gaddesby.
- There are no formal defences within the area but there is natural and engineered high ground around the Gaddesby Brook.
- The area is affected by surface water flooding in all AEP events, but most predominantly in the 0.1% AEP event but effects mostly uninhabited areas.
- There are no reservoir flood extents in the 'Dry Day' or Wet Day' scenarios.
- The area has varied susceptibility to ground water flooding, the groundwater emergence mapping shows that along the Gaddesby Brook (Somerby), and Rearsby Brook (however these do not affect settlements).
- There are no recoded flood events in this area from EA data, there are three recorded events from data provided by LLC, and there are no canal overtopping or breaches from data provided by the Canal and River Trust.

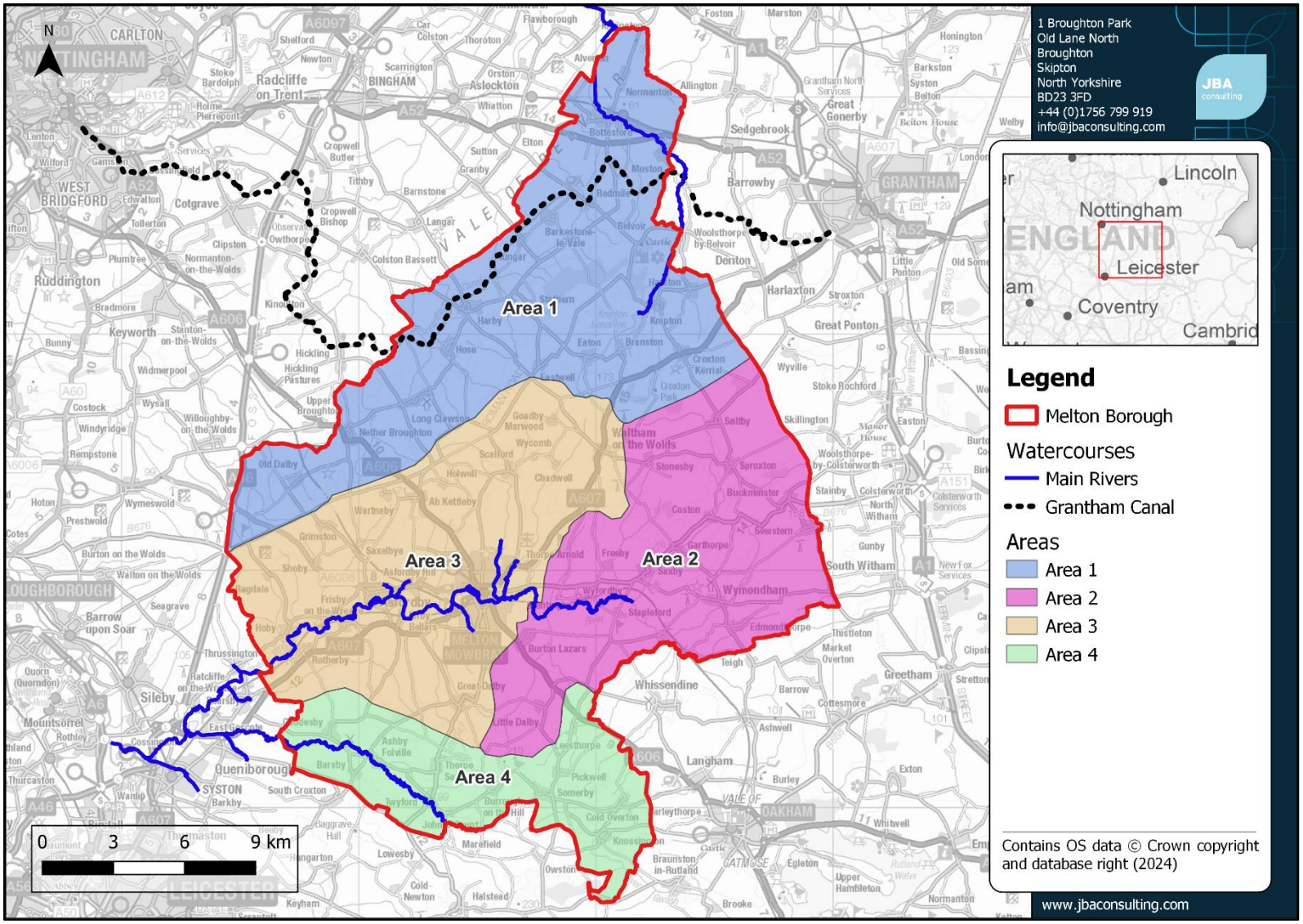


Figure 4-7: Areas used to summarise the flood risk across Melton borough

5 Impact of Climate Change

Climate change projections show an increased chance of warmer, wetter winters and hotter, drier summers with a higher likelihood of more frequent and intense rainfall. This is likely to make severe flooding happen more often.

The NPPF sets out that flood risk should be managed over the lifetime of a development, taking climate change into account. This section sets out how the impact of climate change should be considered.

5.1 Revised climate change guidance

The Climate Change Act 2008 creates a legal requirement for the UK to put in place measures to adapt to climate change and to reduce carbon emissions by at least 80% below 1990 levels by 2050. This was updated in June 2019 under The Climate Change Act 2008 (2050 Target Amendment) Order, to a 100% reduction (or net zero) by 2050.

In 2018, the government published new UK Climate Projections (UKCP18). The EA used these projections to update their climate change guidance for new developments with regards to updated fluvial and rainfall allowances. The EA published updated peak river flow climate change allowances in July 2021 for use in both strategic and site-specific FRAs. The guidance adopts a risk-based approach considering the vulnerability of the development and considers risk allowances on a management catchment level, rather than a river basin level. The guidance was further updated in May 2022 to provide updated climate change allowances for rainfall.

5.1.1 Applying the Climate Change Guidance

Developers will need to undertake a detailed assessment of climate change as part of the planning application process when preparing FRAs. Developers should refer to Flood Risk Assessments: Climate Change Allowances for the latest guidance.

To apply the appropriate climate change guidance to a site, the following information is required:

- The vulnerability of the development – see Annex 3 in the NPPF.
- The likely lifetime of the development – in general 75 years is used for commercial development and 100 for residential, but this needs to be confirmed in an FRA. For development that will have an anticipated lifetime significantly beyond 100 years a higher allowance is required.
- The Management Catchment (assigned by the EA) that the site is located in (as shown in Figure 5-1).
    - The north of the Borough predominantly lies within the Lower Trent and Erewash catchment.
    - The south of the Borough predominantly lies within the Soar Catchment.

- Small sections to the northeast and south of the Borough lie within the Witham and Welland Management Catchments respectively.

Developers should consider the following when deciding which allowances to use to address flood risk for a development or Local Plan allocation:

- Likely depth, speed, and extent of flooding for each allowance of climate change over time considering the allowances for the relevant epoch (2020s, 2050s and 2080s).
- The 'built in' resilience measures used, for example, raised floor levels.
- The capacity or space in the development to include additional resilience measures in the future, using a 'managed adaptive' approach.

If the development is just outside the indicative climate change extents in this SFRA, the impact of climate change should still be considered because the site may be affected should the more extreme climate change scenarios materialise.

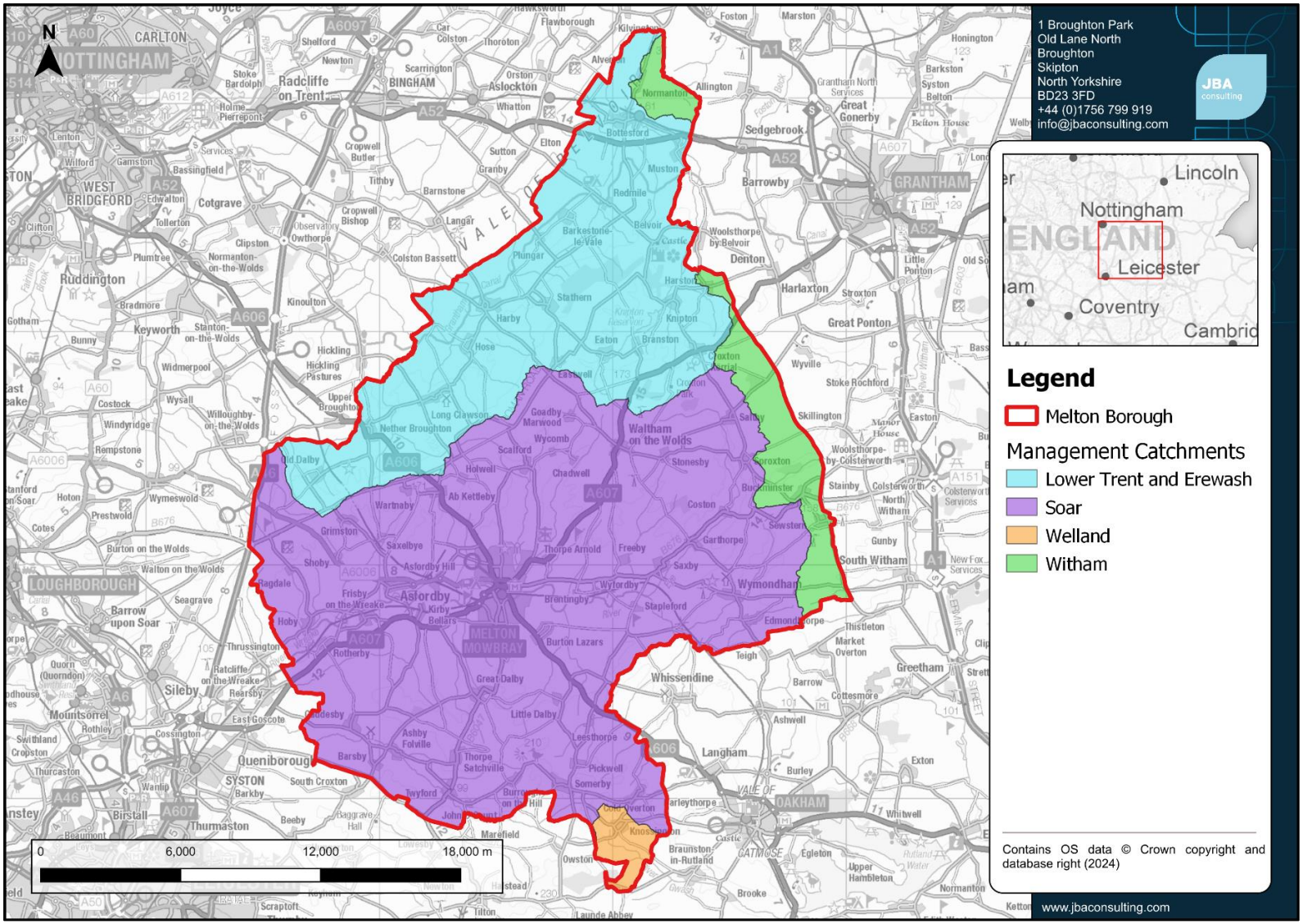


Figure 5-1: Management Catchments (assigned by the EA) across Melton borough

5.2 Relevant allowances for Melton borough

Table 5-1 shows the updated peak river flow allowances that apply in Melton borough for fluvial flood risk for the Lower Trent and Erewash, Soar, Welland, and Witham Derbyshire Management Catchments. These allowances supersede the previous allowances by River Basin District.

The range of allowances are based on percentiles which describe the proportion of possible scenarios that fall below an allowance level:

- The central allowance is based on the 50th percentile (exceeded by 50% of the projections in the range).
- The higher central allowance is based on the 70th percentile (exceeded by 30% of the projections in the range).
- The upper end allowance is based on the 95th percentile (exceeded by 5% of the projections in the range).

Table 5-1: Peak river flow allowances for the Management Catchments which cover Melton borough

Management Catchment	Allowance category	Total potential change (%) anticipated for '2020s' (2015 to 2039)	Total potential change (%) anticipated for '2050s' (2040 to 2069)	Total potential change (%) anticipated for '2080s' (2070 to 2115)
Lower Trent and Erewash	Upper end	29	38	62
Lower Trent and Erewash	Higher central	18	23	39
Lower Trent and Erewash	Central	13	17	29
Soar	Upper end	28	35	60
Soar	Higher central	18	21	37
Soar	Central	14	16	28
Welland	Upper end	22	26	53
Welland	Higher central	10	10	28
Welland	Central	5	4	17
Witham	Upper end	27	32	57
Witham	Higher central	14	15	32
Witham	Central	9	8	21

The range of allowances are based on percentiles which describe the proportion of possible scenarios that fall below an allowance level:

- The Central allowance is based on the 50th percentile (exceeded by 50% of the projections in the range).
- The Upper End allowance is based on the 95th percentile (exceeded by 5% of the projections in the range).

Table 5-2 shows the updated rainfall intensity allowances that apply in Melton borough for surface water flood risk for the different Management Catchments. These allowances supersede the previous country-wide allowances, and should be used for site-scale applications, for surface water flood mapping in small catchments (less than 5km²), and for urbanised drainage catchments.

The range of allowances are based on percentiles which describe the proportion of possible scenarios that fall below an allowance level:

- The Central allowance is based on the 50th percentile (exceeded by 50% of the projections in the range).
- The Upper End allowance is based on the 95th percentile (exceeded by 5% of the projections in the range).

Table 5-2: Peak rainfall intensity allowances for small and urban catchments for the Management Catchments which cover Melton borough

Management Catchment	Allowance category	Total potential change (%) anticipated for '2050s' (2022 to 2060) for 3.3% AEP	Total potential change (%) anticipated for '2050s' (2022 to 2060) for 1% AEP	Total potential change (%) anticipated for '2070s' (2061 to 2125) for 3.3% AEP	Total potential change (%) anticipated for '2070s' (2061 to 2125) for 1% AEP
Lower Trent and Erewash	Upper end	35	40	35	40
Lower Trent and Erewash	Central	20	20	25	25
Soar	Upper end	35	40	35	40
Soar	Central	20	20	25	25
Welland	Upper end	35	40	35	40
Welland	Central	20	20	25	25
Witham	Upper end	35	40	35	40
Witham	Central	20	20	25	25

5.3 Representing climate change in the Level 1 SFRA

The sections below detail the approaches taken to consider climate change for fluvial and surface water flooding.

5.3.1 Fluvial Climate Change

The fluvial hydraulic models received from the EA were reviewed to determine their age, type of model, and the outputs available. A pragmatic approach was then taken to determine a methodology which aims to make best use of the available model data whilst balancing the timescales and budgets. More detailed modelling of different climate change scenarios may need to be considered during a site-specific flood risk assessment.

The following model and allowances were used to represent the 2080s Central climate change estimate:

- River Devon - 1% AEP plus 29% climate change

The following model and allowances were used to represent the 2080s Higher Central climate change estimate:

- River Devon - 1% AEP plus 39% climate change

For all other watercourses, a proxy approach was implemented as follows:

- 1% AEP (Flood Zone 3a) plus climate change scenario
  - where hydraulic modelling was available, the 0.1% AEP outline was used as an indicative climate change extent. Where not available, Flood Zone 2 was used.
- 3.3% AEP (Flood Zone 3b) plus climate change scenario
  - where hydraulic modelling was available, the 1% AEP outline was used as an indicative climate change extent. Where not available, Flood Zone 3a was used.
- 0.1% AEP (Flood Zone 2) plus climate change scenario
  - there is currently no available flood extent which could be used as a proxy. It is therefore recommended that developers undertake detailed modelling as part of their detailed site assessment as part of the planning application process when preparing FRAs.

Extents are presented in MBC's Mapping Portal, and Appendix B details all models used in this assessment.

5.3.2 Surface Water Climate Change

Modelled Climate Change uplifts for the 3.3% and 1% AEP events for the 2070s are included as part of this SFRA and are presented in the MBC's Mapping Portal. The Borough is covered by four management catchments, as shown in Figure 5-1, which all have the same climate change allowances. Therefore, the following Upper End uplifts have been applied across the entire Borough:

- 3.3% AEP with 35% uplifts

- 1% AEP with 40% uplifts

In addition, the 0.1% AEP surface water extent can be used as an indication of surface water risk from smaller watercourses which are too small to be covered by the EA's Flood Zones.

5.3.3 Climate Change within Flood Risk Assessments

Developers will need to undertake a more detailed assessment of climate change as part of the planning application process when preparing FRAs, using the percentage increases which relate to the proposed lifetime and the vulnerability classification of the development. In areas where no modelling is present, this may require development of a 'detailed' hydraulic model, using channel topographic survey. Developers should consult the EA to provide further advice on how best to apply the new climate change guidance.

When undertaking a site-specific FRA, developers should:

- Confirm which national guidance on climate change and new development applies using Flood risk assessments: climate change allowances.
- Apply this guidance when deciding the allowances to be made for climate change, having considered the potential sources of flood risk to the site (using this SFRA), the vulnerability of the development to flooding and the proposed lifetime of the development. If the site is just outside the indicative climate change extents in this SFRA, the impact of climate change should still be considered because the site may be affected should the more extreme climate change scenarios materialise.
- Refer to Section 8 which provides further details on climate change for developers, as part of the FRA guidance, and the SFRA User Guide in Appendix C.

5.4 Impacts of climate change in Melton borough

This section explores which areas of Melton borough are most sensitive to increases in flood risk due to climate change. It should be noted that areas that are already at high risk will also become at increasing risk in future and the frequency of flooding will increase in such areas.

It is recommended that MBC works with other RMAs to review the long-term sustainability of existing and new development in these areas when developing climate change plans and strategies for the Borough.

5.4.1 Impact of climate change on fluvial flood risk

Modelled and proxy climate change extents for the 1% and 3.3% AEP events were compared with their respective present-day extents to determine which areas are most sensitive to climate change.

Areas in Melton borough most sensitive to fluvial impacts of climate change are:

- Along the River Eye though Melton Mowbray.
- Along Scalford Brook in Melton Mowbray, from Melton Country Park to confluence with the River Eye.
- Along the River Devon through Bottesford.
- Along Gaddesby brook to the south of Gaddesby.

It is worth noting that appropriate climate change allowances were only available for the River Devon fluvial model. As such, the use of proxy extents to represent climate change in other areas is a potential limitation to these findings.

5.4.2 Impacts of climate change on surface water flood risk

The 1% AEP surface water event with a 40% climate change uplift can be compared to the present day 1% AEP extent for an indication of areas most sensitive to climate change.

Areas in Melton borough most sensitive to changes in surface water flood risk are typically in areas of low-lying topography on the floodplains of the main watercourses. In particular, the following areas are sensitive to increased surface water flooding due to climate change:

- Along the path of the River Eye through Melton Mowbray and Asfordby.
- Throughout the village of Bottesford.
- Along the path of Burton Brook between the villages of Little Dalby and Burton Lazars.

5.4.3 Impacts of climate change on groundwater flood risk

There is no modelling data available to assess climate change impacts on groundwater. The assessment would depend on the flooding mechanism, historic evidence of known flooding and geological characteristics, for example prolonged rainfall in a chalk catchment. Flood risk could increase when groundwater is already high or emerged, causing additional overland flow paths or areas of still ponding.

A high likelihood of groundwater flooding may mean infiltration SuDS are not appropriate, and groundwater monitoring may be recommended.

5.4.4 Adapting to climate change

The PPG Climate Change guidance contains information and guidance for how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. Examples of adapting to climate change include:

- Considering future climate risks when allocating development sites so that the risks are understood over the development's lifetime.
- Considering the impact of and promoting design responses to flood risk and coastal change for the lifetime of the development.
- Considering availability of water and water infrastructure for the lifetime of the development and design responses to promote water efficiency and protect water quality.
- Promoting adaptation approaches in design policies for developments and the public realm, for example by building in flexibility to allow future adaptation if needed, such as setting new development back from watercourses.

- Identifying no or low-cost responses to climate risks that also deliver other benefits, such as green infrastructure that improves adaptation, biodiversity, and amenity, for example by leaving areas shown to be at risk of flooding as public open space.
- Considering the Standard of Protection (SoP) of defences and sites for future development, in relation to sensitivity to climate change. MBC and developers will need to work with RMAs and use the SFRA datasets to understand whether development is affordable or deliverable. Locating development in such areas of risk may not be a sustainable long-term option, such as at the defence locations mentioned in Section 1; and
- It is recommended that the differences in flood extents from climate change are compared by MBC when allocating sites, to understand how much additional risk there could be, where this risk is in the site, whether the increase is marginal or activates new flow paths, whether it affects access/ egress and how much land could still be developable overall. Recommendations for development are made for the levels of risk in the SFRA User Guide in Appendix C.

6 Flood alleviation schemes and assets

This section provides a summary of existing flood alleviation schemes and assets in Melton borough. Planners should note the areas that are protected by defences where further work to understand the actual and residual flood risk through a Level 2 SFRA may be beneficial. Developers should consider the benefit they provide over the lifetime of a development in a site-specific FRA.

6.1 Asset management

RMAs hold databases of flood risk management and drainage assets according to their jurisdiction as follows:

- The EA holds a national database that is updated by local teams.
- The LLFA holds a database of significant local flood risk assets, required under Section 21 of the FWMA (2010).
- Highways Authorities hold databases of highways drainage assets, such as gullies and connecting pipes.
- Water Companies hold records of public surface water, foul and combined sewers, the records may also include information on culverted watercourses.
- The databases include assets RMAs directly maintain and third-party assets. The drainage network is extensive and will have been modified over time. It is unlikely that any RMA contains full information on the location, condition, and ownership of all the assets in their area. They take a prioritised approach to collecting asset information, which will continue to refine the understanding of flood risk over time.

Developers should collect the available asset information and undertake further survey as necessary to present an understanding of current flood risk and the existing drainage network in a site-specific FRA.

6.2 Standards of Protection

Flood defences are designed to give a specific Standard of Protection (SoP), reducing the risk of flooding to people and property in flood prone areas. For example, a flood defence with a 1% AEP SoP means that the flood risk in the defended area is reduced to at least a 1% chance of flooding in any given year.

Over time the actual SoP provided by the defence may decrease, for example due to deterioration in condition or increases in flood risk due to climate change. The understanding of SoP may also change over time as RMAs undertake more detailed surveys and flood modelling studies.

It should be noted that the EA's on-going hydraulic modelling programme may revise flood risk datasets and, therefore, the SoP offered by flood defences in the area may differ from those discussed in this report.

Developers should consider the SoP provided by defences and residual risk as part of a detailed FRA.

6.3 Maintenance

Different authorities have responsibilities relating to maintenance of flood risk assets.

- The EA and local authorities have permissive powers to maintain and improve main rivers and ordinary watercourses, respectively. The ultimate responsibility for maintaining watercourses rests with the landowner.
- Highway's authorities have a duty to maintain public roads, making sure they are safe, passable, and the impacts of severe weather have been considered. They are also responsible for maintaining sections of watercourses where they are crossed by highways.
- Water companies have a duty to effectually drain their area. What this means in practise is that assets are maintained to common standards and improvements are prioritised for the parts of the network that do not meet this standard, for example where there is frequent highway or sewer flooding.
- LCC as the LLFA has permissive powers and limited resources are prioritised and targeted to where they can have the greatest effect.
- Riparian Owners are responsible for the protection of their properties from flooding as well as other management activities, for example by maintaining riverbeds/ banks, controlling invasive species, and allowing the flow of water to pass without obstruction.

There is potential for the risk of flooding to increase in areas where flood alleviation measures are not maintained regularly. Breaches in raised flood defences are most likely to occur where the condition of a flood defence has degraded over time. Drainage networks in urban areas can also frequently become blocked with debris and this can lead to blockages at culverts or bridges.

It is important that the authorities work in partnership to maintain flood risk assets and manage flood risk across Melton borough.

Developers should not assume that any defence, asset, or watercourse is being or will continue to be maintained throughout the lifetime of a development. They should contact the relevant RMA about current and likely future maintenance arrangements and make future users of the development aware of their obligations to maintain watercourses.

Formal structural defences are given a rating based on a grading system for their condition. A summary of the grading system used by the EA for condition is provided in Table 6-1.

Table 6-1: Grading system used by the EA to assess flood defence condition.

Grade	Rating	Description
1	Very good	Cosmetic defects that will have no effect on performance.
2	Good	Minor defects that will not reduce the overall performance of the asset.
3	Fair	Defects that could reduce the performance of the asset.
4	Poor	Defects that would significantly reduce the performance of the asset. Further investigation required.
5	Very poor	Severe defects resulting in complete performance failure.

Source: Condition Assessment Manual – EA 2006

6.4 Major flood risk management assets in Melton borough

The EA retired the Flood Map for Planning 'Areas Benefiting from Defences' (ABD) dataset in December 2022. This dataset will no longer be available on online mapping. Instead, a developer can Get flood risk information for planning in England by entering their address to get information about their specific site and request flood risk assessment data for planning (also known as Product 4).

The EA now provide a dataset called the 'Reduction in risk of flooding from rivers and sea' which provides areas that are offered some level of reduced flood risk from defences, but with no defined SoP. In Melton borough, a small number of areas are shown to have reduced flood risk due to the presence of defences. These areas include land surrounding Knipton Reservoir and small sections along the River Devon at Muston, and Gaddesby Brook at Ashby Folville. Most notably, there are large sections along the Rivers Wreake and Eye through Melton Mowbray which benefit from reduced flood risk due to defences.

The EA 'AIMS' (Asset Information Management System) flood defence dataset gives further information on all flood defence assets within Melton borough. Table 6-2 details the locations which benefit from flood defences within the 'AIMS; dataset. For further details of specific defences, developers should refer to the AIMS Spatial Flood Defences (inc. standardised attributes).

Table 6-2: Locations shown in the EA 'AIMS' data set.

Watercourse	Location	Type	Design SoP (AEP)	Condition Rating (1-5)
Gaddesby Brook	Right bank to south of Foxville Street and a section along the north of Foxville Street in Ashby Folville	Wall	2% - 1%	2-3

Watercourse	Location	Type	Design SoP (AEP)	Condition Rating (1-5)
Gaddesby Brook	Small section between right bank and Foxville Road to the south-east of Ashby Folville	Embankment	1%	3
River Eye	Small sections north of the River Eye, and south of Brentingby	Wall	1%	Unknown
River Eye	Two sections either side of the River Eye to the east of Stapleford Road	Embankments and Walls	2% - 1% / Unknown	3 / Unknown
River Eye	South side of the railway line where the River Eye crosses west of Lag Lane	Walls and Embankment	1% / Unknown	Unknown
River Wreake	Bounding reservoir south of Hoby Road to the south-west of Asfordby	Embankments, Walls, and Spillway	20% - 10% / Unknown	3 / Unknown
Thorpe Brook	Between Thorpe Road and Saxby Road	Mostly Natural High Ground, some Engineered High Ground, Walls and Embankments	Unknown	3 / Unknown
Dam Embankment	Between lake and Scalford Brook in Melton County Park	Embankment	1%	Unknown
Tributary of the River Wreake	Tributary of the River Wreake along the east side of Asfordby	Embankment	Unknown	3
Welby Brook	Around the junction of Brook Crescent and Melton Road	Embankments, Walls	Unknown	3

6.5 Existing and future flood alleviation schemes

There are currently no known ongoing or potential future schemes within Melton borough.

6.6 Actual and residual flood risk

A Level 2 SFRA (for strategic allocations) or developer site-specific FRA will need to consider the actual and residual flood risk due to the presence of flood and drainage assets in greater detail (although it should be noted that Zone 3b is based on the actual flood risk).

6.6.1 Actual flood risk

This is the risk to the site considering existing flood mitigation measures and any planned to be provided through new development. Note that it is not likely to be acceptable to allocate developments in existing undefended areas on the basis that they will be protected by developer works, unless it can be demonstrated there is a wider community benefit.

The assessment of the actual risk should consider that:

- The level of protection afforded by existing defences might be less than the appropriate standards and hence may need to be improved if further growth is contemplated.
- The flood risk management policy for the defences will provide information on the level of future commitment to maintain existing standards of protection. If there is a conflict between the proposed level of commitment and the future needs to support growth, then it will be a priority for this to be reviewed.
- The standard of safety must be maintained for the intended lifetime of the development. Over time the effects of climate change will erode the present-day SoP afforded by defences and so commitment is needed to invest in the maintenance and upgrade of defences if the present-day levels of protection are to be maintained and where necessary, land secured and safe-guarded that is required for affordable future flood risk management measures.
- By understanding the depth, velocity, speed of onset and rate of rise of floodwater it is possible to assess the level of hazard posed by flood events from the respective sources.

6.6.2 Residual risk

Residual risk is the risk that remains after the effects of flood risk infrastructure have been considered. It is important that these risks are quantified to confirm that the consequences can be safely managed. The residual risk can be:

- The effects of a larger flood than defences were designed to alleviate. This can cause overtopping of flood banks, failure of flood gates to cope with the level of flow or failure of pumping systems to cope with the incoming amount of water.

- Failure of the defences or flood risk management measures, such as breaches in embankments or walls, failure of flood gates to open or close or failure of pumping stations.

This SFRA does not assess the probability of failure other than noting that the probability of a reservoir breach event is extremely low. However, in accordance with NPPF, all sources of flooding need to be considered. If a breach or overtopping event were to occur, then the consequences to people and property could be high. It is the responsibility of the developer to fully assess flood risk, propose measures to mitigate it and demonstrate that any residual risks can be safely managed.

The risk from overtopping of defences is based on the relative heights of property or defence, the distance from the defence level and the height of water above the crest level of the defence. The Defra and EA Flood Risks to People guidance document provides standard flood hazard ratings based on the distance from the defence and the level of overtopping. Any sites located next to defences or perched ponds/ reservoirs, may need overtopping modelling or assessments at the site-specific FRA stage, and climate change needs to be taken in to account.

A breach of a defence occurs when there is a failure in the structure and a subsequent ingress of flood water. Flood flows from breach events can be associated with significant depths and flow velocities in the immediate vicinity of the breach location and so FRAs must include assessment of the hazards that might be present so that the safety of people and structural stability of properties and infrastructure can be appropriately considered. Whilst the area in the immediate vicinity of a breach can be subject to high flows, the whole flood risk area associated with a breach must also be considered as there may be areas remote from the breach that might, due to topography, involve increased depth hazards.

Considerations include the location of a breach, when it would occur and for how long, the depth of the breach (toe level), the loadings on the defence and the potential for multiple breaches. There are currently no national standards for breach assessments and there are various ways of assessing breaches using hydraulic modelling. Work is currently being undertaken by the EA to collate and standardise these methodologies. It is recommended that the EA are consulted if a development site is located near to a flood defence, to understand the level of assessment required and to agree the approach for the breach assessment.

7 Cumulative impact of development and strategic solutions

7.1 Cumulative Impact Assessment

Under the NPPF, strategic policies and their supporting SFRAs are required to 'consider cumulative impacts in, or affecting, local areas susceptible to flooding' (Paragraph 166), rather than just to, or from, individual development sites.

When allocating land for development, consideration should be given to the potential cumulative impact of the loss of floodplain storage volume, as well as the impact of increased flows on flood risk downstream. Whilst the loss of storage for individual developments may only have a minimal impact on flood risk, the cumulative effect of multiple developments may be more severe. Similarly, the effect of the loss of surface water flow paths, surface water ponding and infiltration can also give rise to cumulative effects and potentially exacerbate surface water flood risk.

All developments are required to comply with the NPPF and demonstrate they will not increase flood risk elsewhere. Therefore, providing developments comply with the latest guidance and legislation relating to flood risk and sustainable drainage, and appropriate consideration is given to surface water flow paths and storage proposals should normally not increase flood risk downstream.

Local planning policies can also be used to identify areas where the potential for development to increase flood risk is highest and identify opportunities for such new development to positively contribute to decreases in flood risk downstream.

The CIA assessed catchments in the study area that have the potential to influence existing fluvial and surface water flood risk issues in neighbouring Local Authorities, as well as catchments in the study area that may be influenced by development in catchments in neighbouring Local Authorities. The key consideration for Melton borough is the potential for development within the Borough to impact downstream flood risk.

Historic flood incidents, the current and predicted increase in surface water and fluvial flood risk to properties, and area of proposed new development in each catchment were assessed to identify the catchments at greatest risk. The following high-risk catchments within, or partially within, Melton borough were identified:

- Stroom Dyke Catchment (trib of Smite)
- Devon from Source to Smite
- Ease Drain
- Eye / Wreake from Langham Brook to Soar
- Thorpe Brook Catchment (trib of Eye)

It should be noted that this assessment provides a relative assessment of risk between catchments within Melton borough. Sections 7.2 and 7.3 set out broadscale recommendations across all catchments, and specific recommendations for development

within high risk and medium risk catchments. The full CIA methodology can be found in Appendix F.

7.2 Broadscale recommendations

The following policy recommendations therefore apply to all catchments within the study area:

- Melton Borough Council should work closely with neighbouring local authorities to develop complementary Local Planning Policies for catchments that drain into and out of the area to other local authorities in order to minimise any cross-boundary issues of cumulative impacts of development.
- Developers should incorporate SuDS and provide details of adoption, ongoing maintenance, and management on all development sites. Proposals will be required to provide reasoned justification for not using SuDS techniques, where ground conditions and other key factors show them to be technically feasible. Preference will be given to systems that contribute to the conservation and enhancement of biodiversity and green infrastructure where practicable. Developers should refer to the relevant Lead Local Flood Authority (LLFA) guidance for the requirements for SuDS in Melton borough. Further guidance on SuDS can be found in Section 9.
- Leicestershire County Council as LLFA will review Surface Water Drainage Strategies for major development as defined by Article 2 of The Town and Country Planning (Development Management Procedure) (England) Order 2015. These should consider all sources of flooding to ensure that future development is resilient to flood risk and does not increase flood risk elsewhere.
- Where appropriate, the opportunity for Natural Flood Management (NFM), river restoration and SuDS retrofit in urban areas should be maximised. Culverting should not be supported, and day-lighting existing culverts should be promoted through new developments.
- Runoff rates from all development sites must be limited to greenfield rates (including brownfield sites) unless it can be demonstrated that this is not practicable. If it is demonstrated that greenfield rates are not practicable then the runoff rates should be restricted to the closest rate that is practicable but not exceeding the existing brownfield runoff rate.
- Where required, site-specific FRAs should explore opportunities to provide wider community flood risk benefits through new developments. Measures that can be put in place to contribute to a reduction in flood risk downstream should be considered. This may be either by the provision of additional storage on site such as through oversized SuDS, NFM techniques, green infrastructure, and green-blue corridors, and/ or by providing a Partnership Funding contribution towards any flood alleviation schemes.

- Melton Borough Council should consider requiring developers to contribute to community flood defences outside of their red line boundary to provide wider benefits and help offset the cumulative impact of development.

7.3 Catchment-specific recommendations

Specific recommendations are made for high and medium risk catchments below. If any future windfall sites are proposed within these catchments, then developers should also consider the recommendations detailed so that existing flooding issues in the catchment are not exacerbated by any future development and options for betterment are considered.

7.3.1 Recommendations for high-risk catchments

These recommendations should be considered by developers as part of a site-specific assessment, but more detailed modelling must be undertaken by the developer to ascertain the true storage needs and potential at each site at the planning application stage. The FRA should consider the potential cumulative effects of all proposed development and how this affects sensitive receptors.

The following recommendations are made for high-risk catchments:

- Developers should include a construction surface water management plan to support the Construction Drainage Phasing Plan. This should provide information to the EA, the LLFA and the Local Planning Authority (LPA) regarding the proposed approach to surface water management in storm events during the construction phase.
- The LLFA and LPA should consult with organisations such as wildlife trusts, rivers trusts, canal trusts and catchment partnerships. This will help to understand ongoing and upcoming projects where NFM, flood storage and attenuation, and environmental betterment may be possible alongside developments and aid in reducing flood risk.
- The LPA should work closely with the EA and the LLFA to identify any areas of land that should be safeguarded for any future flood alleviation schemes and NFM features. The EA Working with Natural Processes (WWNP) mapping can help identify where NFM features may be suitable (see Section 7.4 for further details). Investigations should seek to determine where developments have the potential to contribute towards works to reduce flood risk and enable regeneration in catchments as well as contributing to the wider provision of green infrastructure.
- Local nature recovery strategies should be used by plan-makers to inform the way they address the National Planning Policy Framework requirement for plans to protect and enhance biodiversity, taking into consideration The Environment (Local Nature Recovery Strategies) Regulations 2023. Leicestershire County Council have set out a localised plan for their Local Nature Recovery Strategy, which will apply within Melton borough, especially for high-risk catchments.

These recommendations are applicable to the following catchments:

- Stroom Dyke Catchment (trib of Smite)
- Devon from Source to Smite
- Ease Drain
- Eye / Wreake from Langham Brook to Soar
- Thorpe Brook Catchment (trib of Eye)

7.3.2 Development within medium risk catchments

Catchments that have scored an overall ranking of medium, but where development is proposed should also consider the following recommendations:

- LPAs should work closely with the EA and the LLFA to identify any areas of land that should be safeguarded for any future flood alleviation schemes and NFM features.
- There is the potential for development in these catchments to contribute towards works to reduce flood risk and enable regeneration as well as contributing to the wider provision of green infrastructure.

These recommendations are applicable to the following catchments:

- Queniborough Brook Catchment (trib of Wreake)
- Kingston Brook Catchment (trib of Soar)
- Langham Brook from Source to Whissendine Brook

The 'Scalford Brook Catchment (trib of Wreake)' ranked medium but currently contains no proposed site allocations.

7.4 Natural Flood Management (NFM)

NFM is used to protect, restore, and re-naturalise the function of catchments and rivers to reduce flood risk. A wide range of techniques can be used that aim to reduce flooding by working with natural features and processes in order to store or slow down flood waters before they can damage flood risk receptors (for example, people, property and infrastructure). Techniques and measures, which could be applied in Melton borough include:

- Creation of offline storage areas
- Re-meandering streams (creation of new meandering courses or reconnecting cut-off meanders to slow the flow of the river)
- Targeted woodland planting
- Reconnection and restoration of functional floodplains
- Restoration of rivers and removal of redundant structures such as weirs and sluices which are no longer used or needed
- Installation or retainment of large woody material in river channels
- Improvements in management of soil and land use
- Creation of rural and urban SuDS

To maximise the benefits of NFM, it is important that land which is likely to be needed for NFM is protected by safeguarding land for future flood risk management infrastructure. This is particularly important for infrastructure that reduces the risk of flooding to large amounts of existing development, or where options for managing risk in other ways are limited to achieve multiple benefits for flood risk and the environment.

In 2017, the EA published an online Working With Natural Processes (WWNP) evidence base to support the implementation of NFM and maps showing locations with the potential for NFM measures. These maps are intended to be used alongside the evidence directory to help practitioners think about the types of measure that may work in a catchment and the best places in which to locate them. The EA WWMP evidence directory can be found on Working with natural processes to reduce flood risk.

The Trent Rivers Trust also commissioned detailed opportunity mapping for the Lower Trent and Erewash catchments to help partners identify appropriate habitat creation possibilities for sites they may wish to work on, including opportunities for wetland and water retention features. Mapping and further information is available on Lower Trent and Erewash Habitat Creation Opportunities. Additionally, LCC are the lead for the Local Nature Recovery Strategy which also includes habitat creation possibilities. More information can be found in LCC's Local Nature Recovery Strategy.

Other websites that provide further information about ongoing NFM schemes and community works include The Flood Hub and the Rivers Trust NFM National Map.

7.4.1 Opportunities and projects in and/or affecting Melton borough

7.4.1.1 Catchment Based Approach (CaBA)

The Catchment Based Approach (CaBA) was introduced by the Government to establish catchment partnerships throughout England to jointly deliver improved water quality and reduce flood risk, directly supporting achievement of many of the targets set out within the Government's 25-year Environment Plan. CaBA partnerships are actively working in all 100+ river catchments across England and cross-border with Wales. Further details are available on CaBA working together to improve the water environment.

The Lower Trent and Erewash Catchment Partnership, hosted by Trent Rivers Trust, covers the northern part of Melton borough. More information can be found in The Lower Trent and Erewash Catchment Management Plan.

The River Soar Catchment Partnership, hosted by Trent Rivers Trust, covers the main part of Melton borough. More information can be found on the Soar Catchment Plan from 2023 - 2028.

The southern end of Melton borough lies within the Welland Valley Partnership hosted by East Mercia Rivers Trust. They have set out a 5-year Catchment Plan for 2022 - 2027.

7.4.1.2 Leicestershire and Rutland Wildlife Trust

Leicestershire and Rutland Wildlife Trust manage five nature reserves within Melton borough which can be viewed on the Nature Reserves Map. These are:

- **Coombs Meadow** - a suite of grasslands with a wide variety of botanicals, located in Stathern, in the north of Melton borough.
- **Stonesby Quarry** - small quarry reserve with notable plants including pyramidal orchid, autumn gentian, bee orchid, and small scabious, located in Waltham on the Wolds, in the east of the Borough.
- **Holywell Reserves** - disused quarries with a mixture of grassland, woodland, and exposed rock faces, located in Holwell, in the north-west of the Borough.
- **Wymondham Rough** - mosaic of woodland, ponds, grassland, and marshes, located in Stapleford, in the south-west of the Borough.
- **Cribb's Meadow** - small diverse grassland habitat, located between Wymondham and South Witham at the south-west boundary of the Borough.

NFM techniques could be encouraged at some of the reserves to aid flood storage and improve natural habitats.

8 Flood risk management requirements for developers

This section provides guidance on site-specific FRAs. These are carried out by (or on behalf of) developers to assess flood risk to and from a site. They are submitted with Planning Applications and should demonstrate how flood risk will be managed over the development's lifetime, considering climate change and vulnerability of users.

The report provides a strategic assessment of flood risk within Melton borough. Prior to any construction or development, site-specific assessments will need to be undertaken so all forms of flood risk and the actual and residual risk and SoP and safety at a site are considered in more detail. Developers should, where required, undertake more detailed hydrological and hydraulic assessments of watercourses to verify flood extents (including latest climate change allowances), to inform the sequential approach within the site and prove, if required, whether the Exception Test can be satisfied.

A detailed FRA may show that a site, windfall or other, is not appropriate for development of a particular vulnerability or even at all. The Sequential and Exception Tests in the NPPF apply to all developments and an FRA should not be seen as an alternative to proving these tests have been met.

8.1 Principles for new development

8.1.1 Apply the Sequential and Exception Tests

Developers should refer to Section 3.3 for more information on how to consider the Sequential and Exception Tests. For allocated sites, MBC should use the information in this SFRA to apply the Sequential Test. For windfall sites a developer must undertake the Sequential Test, which includes considering reasonable alternative sites at lower flood risk. Only if it passes the Sequential Test should the Exception Test then be applied if required.

Where planning applications come forward on sites allocated in the development plan through the Sequential Test, applicants need not apply the Sequential Test again. However, the Exception Test will need to be applied as proposals at the application stage will need to demonstrate flood risk is not increased elsewhere and is safe.

Developers should also apply the sequential approach to locating development within the site. The following questions should be considered:

- can risk be avoided through substituting less vulnerable uses or by amending the site layout?
- can it be demonstrated that less vulnerable uses for the site have been considered and reasonably discounted? and
- can the site layout be varied to reduce the number of people, the flood risk vulnerability or the building units located in higher risk parts of the site?

8.1.2 Consult with statutory consultees at an early stage to understand their requirements

Developers should consult with the EA, LCC as LLFA, and the relevant water company at an early stage to discuss flood risk including requirements for site-specific FRAs, detailed hydraulic modelling and drainage assessment and design. It should be noted that some of these consultees may need to charge for advice requested by developers or landowners.

8.1.3 Consider the risk from all sources of flooding and that they are using the most up to date flood risk data and guidance

The SFRA can be used by developers to scope out what further detailed work is likely to be needed to inform a site-specific FRA. At a site level, developers will need to check before commencing on a more detailed FRA that they are using the latest available datasets. Developers should apply the most up-to-date climate change guidance (last updated in May 2022) and consider climate change adaptation measures.

8.1.4 Confirm that the development does not increase flood risk elsewhere

Section 9 sets out these requirements for taking a sustainable approach to surface water management. Developers should also confirm that mitigation measures do not increase flood risk elsewhere and that floodplain compensation is provided where necessary.

In catchments potentially at risk from cumulative effects consideration should be given to the cumulative effect of development at locations known to be sensitive to changes in flood risk (these locations might be remote from application sites and could require measures assessed at a catchment scale).

8.1.5 Make the development safe for future users

Consideration should first be given to minimising risk by planning sequentially across a site. Once risk has been minimised as far as possible, only then should mitigation measures be considered. Developers should consider both the actual and residual risk of flooding to the site, as discussed in Section 3.3.

Further flood mitigation measures may be needed for any developments in an area protected by flood defences, where the condition of those defences is ‘fair’ or ‘poor’, and where the SoP is not of the required standard.

8.1.6 Enhance the natural river corridor and floodplain environment through new development

Developments should demonstrate opportunities to create, enhance, and link green assets. This can provide multiple benefits across several disciplines including flood risk and biodiversity/ecology and may provide opportunities to use the land for an amenity and recreational purposes. Development that may adversely affect green infrastructure assets should not be permitted. Where possible, developers should identify and work with partners to explore all avenues for improving the wider river corridor environment. Developers should

open up existing culverts and should not construct new culverts on site except for short lengths to allow essential infrastructure crossings.

Biodiversity Net Gain (BNG) is a strategy to develop land and contribute to the recovery of nature. It is making sure the habitat for wildlife is in a better state than it was before development. BNG has been applicable since November 2023 for developments in the Town and Country Planning Act 1990, unless exempt, and has been applicable to small sites since April 2024. Further information on Biodiversity Net Gain is available on the government website. LCC are the lead for the Local Nature Recovery Strategy which includes BNG strategies, more information can be found in LCC's Local Nature Recovery Strategy.

8.1.7 Consider and contribute to wider flood mitigation strategy and measures in the area and apply the relevant local planning policy

Wherever possible, developments should seek to help reduce flood risk in the wider area, for example, by contributing to a wider community scheme or strategy for strategic measures, such as defences or NFM or by contributing in-kind by mitigating wider flood risk on a development site. Developers must demonstrate in an FRA how they are contributing towards this vision.

8.2 Requirements for site-specific Flood Risk Assessments

8.2.1 When is a Flood Risk Assessment (FRA) required?

Site-specific FRAs are required in the following circumstances:

- Proposals of one hectare or greater in Flood Zone 1.
- Proposals for new development (including minor development such as non-residential extensions, alterations which do not increase the size of the building or householder developments and change of use) in Flood Zones 2 and 3.
- Proposals for new development (including minor development and change of use) in an area within Flood Zone 1 which has critical drainage problems (as notified to the LPA by the EA) (see Section 9.4.4 for more information on critical drainage problems).
- Where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding (for example, high risk surface water flooding Zone B, groundwater, sewer, or reservoir).
- Land identified in this SFRA as being at increased flood risk in the future.

An FRA may also be required for some specific situations:

- If the site may be at risk from the breach of a local defence (even if the site is in Flood Zone 1)
- Where evidence of historical or recent flood events have been passed to the LPA
- Land identified in an SFRA as being at increased risk in the future.

8.2.2 Objectives of a site-specific FRA

Site-specific FRAs should be proportionate to the degree of flood risk and the scale, nature, and location of the development.

Site-specific FRAs should establish:

- Whether a proposed development is likely to be affected by current or future flooding from any source.
- Whether a proposed development will increase flood risk elsewhere.
- Whether the measures proposed to deal with the effects and risks are appropriate.
- The evidence, if necessary, for the LPA to apply the Sequential Test; and
- Whether, if applicable, the development will be safe and pass the Exception Test.

FRAs should be carried out in line with the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change Planning Practice Guidance (PPG), MBC's Local Plan Policies and SuDS Strategy, and guidance provided by the EA. Guidance and advice for developers on the preparation of site-specific FRAs is available below:

- Standing Advice on Flood Risk (EA)
- Flood Risk Assessment for Planning Applications (EA); and
- Site-specific Flood Risk Assessment: Checklist (NPPF PPG, Defra)

Guidance for LPAs for reviewing FRAs submitted as part of planning applications has been published by Defra in 2015 through their National flood risk standing advice for local planning authorities.

Guidance should be sought from the MBC, the EA, the LLFA and relevant water company at the earliest possible stage, and opportunities should be taken to incorporate environmental enhancements and reduce flooding from all sources both to and from the site through development proposals. Developers should seek to go beyond managing the flood risk and support reduction of wider flood risk, whilst enhancing and conserving the natural environment. Further advice can be found at Flood risk and coastal change.

8.2.3 Site layout and design

Flood risk should be considered at an early stage when deciding the layout and design of a site to provide an opportunity to reduce flood risk within the development. Early engagement with MBC, LCC as LLFA, the EA and the relevant water company is advised.

The NPPF states that a sequential, risk-based approach should be applied to try to locate more vulnerable land uses away from Flood Zones to higher ground and lower flood risk areas, while more flood-compatible development (such as vehicular parking and recreational space) can be located in higher risk areas. Higher risk areas can also be retained and enhanced as natural green space. Whether parking in floodplains is appropriate will be based on the likely flood depths and hazard, evacuation procedures and availability of flood warning.

Waterside areas, or areas along known flow routes, can act as green infrastructure, being used for recreation, amenity, and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits contributing to other sustainability objectives. Landscaping should provide safe access to higher ground from these areas and avoid the creation of isolated islands as water levels rise.

When designing sites, developers should consider the Hierarchy of Drainage, as stated in the PPG, aiming to discharge surface water runoff as high up the drainage hierarchy as reasonably practicable:

1. into the ground (infiltration)
2. to a surface water body
3. to a surface water sewer, highway drain, or another drainage system
4. to a combined sewer

8.2.4 Modification of ground levels

Any proposal for modification of ground levels will need to be assessed as part of a detailed FRA.

Modifying ground levels to raise the land above the required flood level is an effective way of reducing flood risk to a particular site in circumstances where the land does not act as conveyance for flood waters. However, care must be taken as raising land above the floodplain could reduce conveyance or flood storage in the floodplain and could adversely impact flood risk downstream or on neighbouring land. Raising ground levels can also deflect flood flows, so analyses should be performed to demonstrate that there are no adverse effects on third party land or property.

Compensatory flood storage should be provided, and would normally be on a level for level, volume for volume basis on land that does not currently flood but is adjacent to the floodplain (for it to fill and drain). It should be in the vicinity of the site and within the red line of the planning application boundary (unless the site is strategically allocated). Guidance on how to address floodplain compensation is provided in Appendix A3 of the CIRIA Publication C624.

Where proposed development results in a change in building footprint, the developer should confirm that it does not impact upon the ability of the floodplain to store or convey water and seek opportunities to provide floodplain betterment.

Raising levels can also create areas where surface water might pond during significant rainfall events. Any proposals to raise ground levels should be tested to check that it would not cause increased ponding or build-up of surface runoff on third party land.

Applicants should note that changes to manhole cover levels on public sewer and increase / displace flood risk which will require careful consideration with the relevant water company. Applicants should not assume that any alteration to a public sewer, including diversion, will be acceptable as this could have adverse flood risk consequences.

For all developments regardless of any identified sewer flood risk that is identified on or near to the site, it is good practice for the finished floor levels and manhole cover levels (including those that serve private drainage runs) to be higher than the manhole cover level at the point of connection to the receiving sewer. Where the ground level of the site is below the ground level at the point where the drainage connects to the public sewer, care must be taken to ensure that the proposed development is not at increased risk of sewer surcharge.

8.2.5 Raised floor levels

If raised floor levels are proposed, these should be agreed with MBC and the EA. The minimum Finished Floor Level (FFL) may change dependent upon the vulnerability and flood risk to the development.

Developers should refer to the latest EA standing advice for information on FFLs, available on Preparing a flood risk assessment standing advice, but generally the EA advises that minimum finished floor levels should be set 600mm above the 1% AEP fluvial plus climate change peak flood level, where the appropriate new climate change allowances have been used (see Section 5.2 for the climate change allowances). An additional allowance may be required because of residual risk relating to breach of defences and risks relating to blockages to the channel, culvert or bridge, which should be considered as part of an FRA. Lowering existing FFLs below the existing levels within the 1% AEP plus climate change floodplain would not be acceptable and should be discouraged. New development offers opportunities to improve the resilience of buildings.

Allocating the ground floor of a building for less vulnerable, non-residential, use is an effective way of raising living space above flood levels. Single storey buildings such as ground floor flats or bungalows are especially vulnerable to rapid rise of water (such as that experienced during a breach). This risk can be reduced by use of multiple storey construction and raised areas that provide an escape route.

Similarly, the use of basements should be avoided. Habitable uses of basements within Flood Zone 3 and areas at risk of surface water flooding in the surface water flood zone B should not be permitted, whilst basement dwellings in Flood Zone 2 will be required to pass the Exception Test.

Where the ground level of a site is below the ground level at the point where the drainage connects to the public sewer, care must be taken to ensure that the proposed development is not at an increased risk of sewer surcharge. It is good practice for the finished floor levels and manhole cover levels (including those that serve private drainage runs) to be higher than the manhole cover level at the point of connection to the receiving sewer. Alternatively, mitigation measures may need to be incorporated into the proposals to protect against sewer surcharge.

8.2.6 Development and raised defences

Construction of localised raised floodwalls or embankments to protect new development is not a preferred option, as a residual risk of flooding will remain. Compensatory storage must be provided where raised defences remove storage from the floodplain.

Where development is located behind, or in an area benefitting from defences, the residual risk of flooding must be considered.

8.2.7 Developer contributions

In some cases, and following the application of the Sequential Test, it may be appropriate for the developer to contribute to the improvement of flood defence provision that would benefit both proposed new development and the existing local community. Developer contributions can also be made to maintenance and provision of flood risk management assets, flood warning and the reduction of surface water flooding (such as through SuDS). This relates to the Community Infrastructure Levy, a charge that can be levied by local authorities on new development in their area to help them deliver the infrastructure needed to support development in their area, and planning obligations including Section 106. The government website provides further information on the Community Infrastructure Levy and planning obligations. Additional guidance can also be accessed through the MBC Developer Contributions Supplementary Planning Document.

8.2.8 Buffer strips

The provision of a buffer strip allows additional capacity to accommodate climate change and means access to the watercourse, structures and defences is maintained for future maintenance purposes. It also enables the avoidance of disturbing riverbanks, adversely impacting ecology, and having to construct engineered riverbank protection. Any watercourse crossings should ensure that flood risk is not impacted. A buffer strip of at least 8 metres is required from any main river. Where flood defences are present, these distances should be taken from the toe of the defence.

Building adjacent to riverbanks can cause problems to the structural integrity of the riverbanks and the building itself, making future maintenance of the river much more difficult. Any development in these areas will likely require Flood Risk Activity Permits from the EA alongside any permission. There should be no built development within these distances from main rivers / flood defences (where present). Further advice and guidance on Flood Risk Activity Permits is available on Flood risk activities: environmental permits.

8.2.9 Making space for water

The PPG sets out a clear aim in Flood Zone 3 to create space for flooding by restoring functional floodplain. Generally, development should be directed away from these areas.

All new development close to rivers should consider the opportunity to improve and enhance the river environment. Developments should look at opportunities for river restoration and enhancement as part of the development. Options include backwater

creation, de-silting, in-channel habitat enhancement and removal of structures. When designed properly, such measures can have benefits such as reducing the costs of maintaining hard engineering structures, reducing flood risk, improving water quality, and increasing biodiversity. Social benefits are also gained by increasing green space and access to the river.

8.3 Resistance and resilience measures

The consideration of resistance and resilience measures should not be used to justify development in inappropriate locations. However, having applied planning policy, there will be instances where developments, such as those that are water compatible and essential infrastructure are permitted in high flood risk areas.

In these instances, the above measures should be considered before resistance and resilience measures are relied on. The effectiveness of these forms of measures are often dependant on the availability of a reliable forecasting and warning system and the use of back up pumping to evacuate water from a property as quickly as possible. The proposals must include details of how the temporary measures will be erected and decommissioned, responsibility for maintenance and the cost of replacement when they deteriorate. Available resistance and resilience measures include:

- Permanent barriers which can include built up doorsteps, rendered brick walls and toughened glass barriers.
- Temporary barriers which consist of moveable flood defences which can be fitted into doorways and/or windows. The permanent fixings required to install these temporary defences should be discrete and keep architectural impact to a minimum. On a smaller scale, temporary snap on covers for airbricks and air vents can also be fitted to prevent the entrance of flood water.
- Community resistance measures which include demountable defences that can be deployed by local communities to reduce the risk of water ingress to several properties. The methods require the deployment of inflatable (usually with water) or temporary quick assembly barriers in conjunction with pumps to collect water that seeps through the systems during a flood.
- Flood resilience measures which aim to limit any permanent damage, prevent the structural integrity of the building being compromised and make the clean up after the flood is easier. Interior design measures to reduce damage caused by flooding can include electrical circuitry installed at a higher level and water-resistant materials for floors, walls, and fixtures.

Guidance on flood resilient and flood resistant construction techniques is available on Flood resilient construction of new buildings.

There are also opportunities for 'change of use' developments to be used to improve the flood resistance and resilience of existing development, which may not have been informed by a site-specific flood risk assessment when it was first constructed.

8.4 Reducing flood risk from other sources

8.4.1 Groundwater

Groundwater flooding has a very different flood mechanism to any other and so many conventional flood mitigation methods are not suitable. The only way to fully reduce flood risk would be through building design (development form), ensuring floor levels are raised above the water levels caused by a 1% AEP plus climate change. Site design would also need to preserve any flow routes followed by the groundwater overland so that flood risk is not increased downstream.

Infiltration SuDS can increase groundwater levels and subsequently may increase flood risk on or off a site. Developers should provide evidence that this will not be a significant risk. Other underground works, such as basements, may also need to be assessed as part of a site-specific FRA in certain prone areas susceptible to groundwater issues.

8.4.2 Surface water and sewer flooding

Developers should discuss public sewerage capacity with the water utility company at the earliest possible stage. It is important that a Surface Water Drainage Strategy (often undertaken as part of an FRA) shows that this will not increase flood risk elsewhere, and that the drainage requirements regarding runoff rates and SuDS for new development are met.

If residual surface water flood risk remains, the likely flow routes and depths across the site should be modelled. The site should be designed so that these flow routes are preserved and building design should provide resilience against this residual risk.

When redeveloping existing buildings, the installation of some permanent or temporary floodproofing and resilience measures could protect against both surface water and sewer flooding. Non-return valves prevent water entering the property from drains and sewers. Non-return valves can be installed within gravity sewers or drains within a property's private sewer upstream of the public sewerage system. These need to be carefully installed and must be regularly maintained.

Consideration must also be given to attenuation and flow ensuring that flows during the 1% AEP plus climate change storm event are retained within the site if any flap valves shut. This should be demonstrated with suitable modelling techniques.

8.4.3 Reservoirs

As discussed in Section 4.8, the risk of reservoir flooding is extremely low. However, there remains a residual risk to development from reservoirs which developers should consider during the planning stage:

- Developers should contact the reservoir owner for information on:
  - the Reservoir Risk Designation

  - reservoir characteristics: type, dam height at outlet, area/volume, overflow location
  - operation: discharge rates / maximum discharge
  - discharge during emergency drawdown; and
  - inspection / maintenance regime.

- The EA online Reservoir Flood Maps contain information on the predicted extents following a reservoir breach both when rivers are at normal levels and in conjunction with rivers in flood conditions (note: only for those reservoirs with an impounded volume greater than 25,000 cubic metres are governed by the Reservoir Act 1975). Consideration should be given to the extents shown in these online maps.
- Reservoirs: owner and operator requirements guidance provides information on how to register reservoirs, appoint a panel engineer, produce a flood plan, and report an incident.
- In addition, developers should consult the Leicestershire County Council's Emergency Planning Team about emergency plans.

Developers should use the above information to:

- Apply the sequential approach to locating development within the site.
- Consider the impact of a breach and overtopping, particularly for sites proposed to be located immediately downstream of a reservoir. This should consider whether there is sufficient time to respond, and whether in fact it is appropriate to place development immediately on the downstream side of a reservoir.
- Assess the potential hydraulic forces imposed by sudden reservoir failure event and check that that the proposed infrastructure fabric could withstand the structural loads.
- Develop site-specific Emergency Plans and/ or Off-site Plans if necessary and make the future users of the development aware of these plans. This may need to consider emergency drawdown and the movement of people beforehand.

The potential implications of proposed development on the risk designation of the reservoir should also be considered, as it is a requirement that in particular circumstances where there could be a danger to life, that a commitment is made to the hydraulic capacity and safety of the reservoir embankment and spillway. The implications of such an obligation should be identified and understood before new development is permitted, to ensure it can be achieved.

8.5 Emergency planning

The Civil Contingencies Act 2004 lists Local Authorities, the Environment Agency and emergency services as Category 1 responders. Category 1 responders are responsible for reducing, controlling, and mitigating the effects of emergencies in both response and recovery phases.

The National Planning Policy takes this into account by seeking to avoid inappropriate development in areas of flood risk and considering the vulnerability of new developments to flooding.

The 2023 NPPF (Paragraph 173) requires site level FRAs to demonstrate that "any residual risk can be safely managed; and safe access and escape routes are included where appropriate, as part of an agreed emergency plan."

In accordance with the NPPF, SFRAs, PFRAs and SWMPs can be used in the preparation and execution of a flood emergency plan as they can indicate areas that may be at risk of flooding. These can be provided as part of an FRA or as a separate document. Decisions regarding whether an Emergency Plan is required sits with the LPA, with advice from their Emergency Planning Teams, the Environment Agency and LLFA.

According to the PPG, an emergency plan is needed wherever emergency flood response is an important component of making a development safe; this includes the free movement of people during a 'design flood' and potential evacuation during an extreme flood.

Emergency plans are essential for any site with transient occupancy in areas at risk of flooding, such as holiday accommodation, hotels, caravan, and camping sites (PPG Paragraph 043).

Emergency Plans should consider:

- The type of flood risk present, and the extent to which advance warning can be given in a flood event.
- The number of people that would require evacuation from the area potentially at risk.
- The vulnerability of site occupants.
- The impact of the flooding on essential services such as electricity, gas, telecommunications, water supply and sewerage.
- Safe access and egress for users and emergency services.

MBC advise that during flooding, people will either stay with family or friends, have alternative accommodation provided by their insurer, landlord or MBC Housing Team, or a rest centre will provide temporary shelter with provision of humanitarian assistance. If a rest centre is required, the Resilience Partnership Team will advise on suitable locations through their alerting text system.

The Leicestershire Local Resilience Forum provide Emergency Planning information about risks to the community, warn of hazardous conditions, such as flooding, snow, and drought, and provide information on preparing for emergency situations. Information is available from their website Leicester, Leicestershire and Rutland Aware and Prepared.

Further information is available from the following documents:

- The National Planning Policy Guidance
- 2004 Civil Contingencies Act
- Defra (2014) National Flood Emergency Framework for England
- FloodRe

- The EA and Defra's Standing Advice for FRAs
- MBC's 'Flooding' website page
- EA's 'How to plan ahead for flooding'
- Sign up for Flood Warnings with the EA
- The National Flood Forum
- GOV.UK 'Prepare for flooding' page
- ADEPT Flood Risk Plans for new development

9 Surface water management and SuDS

This section provides guidance and advice on managing surface water runoff and flooding.

9.1 Roles of the Lead Local Flood Authority and Local Planning Authority in surface water management

LCC, as the LLFA, is a statutory planning consultee. They provide technical advice on surface water drainage strategies and designs put forward for major development proposals, to confirm that onsite drainage systems are designed in accordance with the current legislation and guidance.

When considering planning applications, the drainage team will provide advice to the Planning Department on the management of surface water. The LPA should satisfy themselves that the development's proposed minimum standards of operation are appropriate and, using planning conditions or planning obligations, that there are clear arrangements for on-going maintenance over the lifetime of the development.

It is essential that developers consider sustainable drainage at an early stage of the development process – ideally at the pre-application or master-planning stage. To further inform development proposals at the master-planning stage, pre-application submissions are accepted by MBC. This will assist with the delivery of well designed, appropriate, and effective SuDS. Applicants are also encouraged to engage with the relevant water company to discuss their foul and surface water proposals, especially where adoption is proposed.

Currently the use of SuDS is driven through planning policy. However, Schedule 3 of the FWMA 2010 is expected to be implemented following a government review making SuDS mandatory for new developments in England. Schedule 3 will provide a framework for the approval and adoption of drainage systems, a SuDS Approving Body (SAB) within unitary and county councils, and national standards on the design, construction, operation, and maintenance of SuDS for the lifetime of the development.

9.2 Sustainable Drainage Systems (SuDS)

SuDS are designed to maximise the opportunities and benefits that can be secured from surface water management practices.

SuDS provide a means of dealing with the quantity and quality of surface water and can also provide amenity and biodiversity benefits. Given the flexible nature of SuDS they can be used in most situations within new developments as well as being retrofitted into existing developments. SuDS can also be designed to fit into most spaces. For example, permeable paving could be used in parking spaces or rainwater gardens as part of traffic calming measures.

It is a requirement for all new major development proposals that SuDS for management of runoff are put in place, unless there is clear evidence that this would be inappropriate (NPPF Paragraph 175). Where possible, SuDS that offer multiple benefits should be given

priority. It is important that SuDS are maintained for the lifetime for the development so that features can function as designed. Consideration should be given to enhancing SuDS to achieve biodiversity net gain which will contribute towards any local nature recovery ambitions, such as those set out in the Local Nature Recovery Strategy.

9.3 Sources of SuDS guidance

9.3.1 C753 CIRIA SuDS Manual (2015)

The C753 CIRIA SuDS Manual (2015) provides guidance on planning, design, construction, and maintenance of SuDS. The manual is divided into five sections ranging from a high-level overview of SuDS, progressing to more detailed guidance with progression through the document.

9.3.2 Non-Statutory Technical Guidance, Defra (March 2015)

SUDS: non-statutory technical standards guidance provides non-statutory standards on the design and performance of SuDS. It outlines peak flow control, volume control, structural integrity, flood risk management and maintenance and construction considerations.

9.3.3 Non-statutory Technical Guidance for Sustainable Drainage Practice Guidance, LASOO (2016)

The Local Authority SuDS Officer Organisation (LASOO) produced their practice guidance in 2016 to give further detail to the Non-Statutory technical standards for sustainable drainage.

9.3.4 Melton Borough Council Planning Policy

MBC leads consultation on planning policy for any works within the Borough. The overarching policies are those based on the Local Plan and specific consultations can be made through the dedicated Consultation Portal for Planning Policy. MBC's Design of Development Supplementary planning Document provides guidance on the use of SuDS to manage surface water alongside guidance on the treatment of existing watercourses.

9.3.5 Leicestershire County Council SuDS guidance

Leicestershire County Council has dedicated to information regarding sustainable Surface water drainage for development. This includes a summary of what SuDS are and planning application requirements.

9.4 Other surface water considerations

9.4.1 Groundwater Vulnerability Zones

The EA published new groundwater vulnerability maps in 2015. These maps provide a separate assessment of the vulnerability of groundwater in overlying superficial rocks and those that comprise of the underlying bedrock. The map shows the vulnerability of groundwater at a location based on the hydrological, hydro-ecological, and soil properties within a one-kilometre grid square.

The groundwater vulnerability maps should be considered when designing SuDS. Depending on the height of the water table at the location of the proposed development site, restrictions may be placed on the types of SuDS appropriate to certain areas. Groundwater vulnerability maps can be found on Defra's interactive mapping.

9.4.2 Groundwater Source Protection Zones (GSPZ)

The EA also defines Groundwater Source Protection Zones (GSPZs) near groundwater abstraction points. These protect areas of groundwater used for drinking water. The GSPZ requires attenuated storage of runoff to prevent infiltration and contamination. GSPZs can be viewed on Defra's interactive mapping. Three main zones are defined as follows:

- Inner protection zone (Zone 1) - areas from where pollution can travel to the groundwater source within 50 days or is at least a 50m radius.
- Outer protection zone (Zone 2) - areas from where pollution can travel to the groundwater source within 400 days or lies within the nearest 25% of the total catchment area (whichever is largest).
- Total catchment (Zone 3) - the total area needed to support removal/discharge of water from the groundwater source.

Online mapping shows there is currently one GSPZ which lies along a small section of the eastern boundary of Melton borough. Where a site is located in a GSPZ used for public water supply, applicants should engage with the relevant water company to understand any concerns and any necessary mitigating measures to manage the risk of development to public water supply.

9.4.3 Nitrate Vulnerable Zones

Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution. Nitrate levels in waterbodies are affected by surface water runoff from surrounding agricultural land entering receiving waterbodies. The level of nitrate contamination will potentially influence the choice of SuDS and should be assessed as part of the design process.

The website Check for Drinking Water safeguard Zones and NVZs shows there are six pre appeal NVZ 2021 to 2024 areas affecting Melton borough.

Currently, information on the 2021 to 2024 NVZs post-appeal is unavailable. Landowners can appeal an NVZ designation once notified if their land (or part of it):

- Does not drain into water that has been identified as polluted.
- Drains into water that should not be identified as polluted.

9.4.4 Critical Drainage Areas

Areas with Critical Drainage Problems (ACDPs) is land formally notified to the LPA by the EA as having critical drainage problems. Within ACDPs, proposed development may present increased risks of flooding both on and off site if the surface water runoff is not effectively managed. A dataset containing ACDPs is available to download. There are currently no ACDPs identified within Melton borough.

10 Summary and recommendations

Parts of Melton borough are at risk of flooding from the following sources: fluvial, surface water, groundwater, sewers, reservoir inundation, and overtopping/ breaches from canals. This study has shown that the most significant sources of flood risk in Melton borough are fluvial and surface water. The findings of flood risk from all sources are summarised in this section, along with recommendations for Melton borough which should be considered alongside recommendations emerging from the CIA in Section 7.

10.1 Findings on all sources of flood risk

10.1.1 Fluvial

The primary fluvial flood risk in the Borough is along the River Eye, River Wreake, River Devon, and Gaddesby Brook. These potential sources of fluvial flooding are rivers that flow through Melton Mowbray near the centre of the Borough, Knipton and Bottesford in the north, and Ashby Folville in the south.

10.1.2 Surface water

The Risk of Flooding from Surface Water map shows a number of prominent overland flow routes that largely follow the topography and watercourses of the Borough. There are some areas where there are additional flow paths and areas of ponding, for example where water is impounded at road or rail embankments and in low-lying areas. While the Borough is largely rural, there are considerable flow routes following the roads through the urban area of Melton Mowbray and the village of Bottesford, alongside isolated areas of ponding, which may affect many properties across these settlements.

10.1.3 Climate change

Areas at risk of flooding today are likely to become at increased risk in the future and the frequency of flooding will also increase in such areas, due to climate change. Flood extents will increase; in some locations, this may be minimal, but flood depth, velocity and hazard may have more of an impact due to climate change. It is recommended that MBC work with other Risk Management Authorities (RMAs) to review the long-term sustainability of existing and new development when developing climate change plans and strategies for Melton borough.

10.1.4 Sewer

Severn Trent Water provide water services and sewerage services across the majority of the Borough, with Anglian Water serving small parts within the north, east and south boundaries. Severn Trent Water have provided details of historic sewer flooding across the Borough. Postcodes identified with a higher number of previous sewer flooding events are

in Asfordby, Old Dalby, Waltham on the Wolds, Stathern, Harby, and Long Clawson. Data from Anglian Water was not available at the time of publication.

10.1.5 Groundwater

The Areas Susceptible to Groundwater Flooding map shows that in general, areas with greater than 50% susceptibility to groundwater flooding are limited, although do occur around flow routes such as the River Eye, River Wreake and River Devon. Generally, these areas are located in the far north of the Borough and at locations spanning east to west along the course of the River Wreake and River Eye. The JBA Groundwater Emergence Map reflects this, with similar flow routes experiencing emergence levels within 0.5m of the surface. Furthermore, the data shows groundwater emergence levels within 0.25m of the surface in the north of the Borough in Easthorpe and Bottesford, and in the east of Melton Mowbray.

10.1.6 Canals

The Grantham Canal runs through the north of the Borough, through a largely rural area, passing villages such as Harby, Plungar, and Redmile. The canal has the potential to interact with other watercourses such as the Winter Beck and become a flow path during flood events or in a breach scenario. The Canal and River Trust were consulted as part of the SFRA and provided details of 21 recorded overtopping incidents and 3 breach incidents which occurred on the Grantham Canal, largely concentrated to the west of Hose, in the west of the Borough, with one breach incident occurring to the west of Redmile. Local canal trusts in Melton borough have restoration plans for former navigation routes such as the Oakham Canal and Melton Mowbray Navigation. Upon any changes to these networks in Melton borough, the impacts on flood risk will need to be assessed and the Local Plan updated.

10.1.7 Reservoirs

The current mapping shows that there are eight reservoirs located within Melton borough, with 'wet day' or 'dry day' scenarios affecting the Borough. The level and standard of inspection and maintenance required under the Reservoirs Act means that the risk of flooding from reservoirs is relatively low. However, there is a residual risk of a reservoir breach, and this risk should be considered in any site-specific FRAs (where relevant) in accordance with the updated PPG.

Defences: The EA AIMS dataset provides information on flood defence assets across the Borough. The main defence type across the study area is 'Natural High Ground', located along the main watercourses in the study area. Engineered defences in the Borough include embankments and walls on the River Wreake, River Eye, Gaddesby Brook, Welby Brook, and Thorpe Brook.

10.2 Recommendations for Melton borough

10.2.1 Reduction of flood risk through site allocations and appropriate site design

- To locate new development in areas of lowest risk, in line with the sequential test, by steering sites to Flood Zone 1 from the Flood Map for Planning and avoiding where possible areas with a higher risk of surface water flooding. If a sequential test is undertaken and a site at flood risk is identified as the only appropriate site for the development, the exception test should be undertaken. If development can't be avoided in the higher risk surface water Zone (Zone B), then part "b" of the exception test should be satisfied.
- After application of the exception test, a sequential approach to site design should be used to reduce risk. Any re-development within areas of flood risk which provide other wider sustainability benefits will provide flood risk betterment and be made resilient to flooding.
- Identification of long-term opportunities to remove development from the floodplain and to make space for water.
- Ordinary watercourses not currently afforded flood maps should be modelled to an appropriate level of detail to enable a sequential approach to the layout of the development.
- Confirm development is 'safe', dry pedestrian egress from the floodplain and emergency vehicular access should be possible for all residential development. If at risk, then an assessment should be undertaken to detail the flood duration, depth, velocity, and flood hazard rating in the 1% AEP plus climate change flood event, in line with FD2320, Flood Risk Assessment Guidance for New Development.
- Raise residential and commercial finished floor levels in line with the latest Preparing a flood risk assessment: standing advice. Generally, the EA advises that minimum finished floor levels should be set 600mm above the 1% AEP fluvial plus climate change peak flood level, where the appropriate new climate change allowances have been used, but higher or lower values may be appropriate in some cases.
- Protect and promote areas for future flood alleviation schemes.
- Identify opportunities for brownfield sites in functional floodplain to reduce risk and provide flood risk betterment.
- Identify opportunities to help fund future flood risk management through developer contributions to reduce risk for surrounding areas.
- Seek opportunities to make space for water to accommodate climate change.

10.2.2 Promote SuDS to mimic natural drainage routes to improve water quality

- Planners should be aware of the conditions set by the LLFAs for surface water management. The enactment of Schedule 3 of the FWMA means that there will be mandatory standards for delivery and adoption of SuDS in new developments.
- SuDS design should demonstrate how constraints have been considered and how the design provides multiple benefits for example landscape enhancement, biodiversity, recreation, amenity, leisure and the enhancement of historical features.
- Planning applications for phased developments should be accompanied by a drainage strategy, which takes a strategic approach to drainage provision across the entire site and incorporates adequate provision for SuDS within each phase.
- Use of the SuDS management train to prevent and control pollutants to prevent the 'first flush' polluting the receiving waterbody.
- SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual.

10.2.3 Reduce surface water runoff from new developments and agricultural land

- Space should be provided for the inclusion of SuDS on all allocated sites, outline proposals and full planning applications.
- Promote biodiversity, habitat improvements and Countryside Stewardship schemes help prevent soil loss and to reduce runoff from agricultural land. More information can be found on Runoff and Soil Erosion Risk Assessment: Countryside Stewardship.
- Identify opportunities to maintain and enhance permeable surfaces and greenspaces to help reduce surface water runoff whilst promoting other benefits, including biodiversity and wellbeing.

10.2.4 Enhance and restore river corridors and habitats

- Assess condition of existing assets and upgrade, if required, to confirm that the infrastructure can accommodate pressures/flows for the lifetime of the development.
- Natural drainage features should be maintained.
- Identify opportunities for river restoration/enhancement to make space for water.
- A presumption against culverting of open watercourses except where essential to allow highways and/or other infrastructure to cross, in line with CIRIA's Culvert design and operation guide (C689) and to restrict development over culverts.

- There should be no built development within 8m from the top of a watercourse or main river for the preservation of the watercourse corridor, wildlife habitat, flood flow conveyance and future watercourse maintenance or improvement.
- Opportunities will also be identified through Leicestershire's emerging Local Nature Recovery Strategy, which will map areas of importance for biodiversity and habitats, nature recovery actions and potential measures to be implemented.

10.2.5 Mitigate against risk, improved emergency planning and flood awareness

- Work with emergency planning colleagues and stakeholders to identify areas at highest risk and locate most vulnerable receptors.
- Exceedance flows, both within and outside of the site, should be appropriately designed to minimise risks to both people and property.
- For a partial or completely pumped drainage system, an assessment should be undertaken to assess the risk of flooding due to any failure of the pumps to be assessed. The design flood level should be determined if the pumps were to fail; if the attenuation storage was full, and if a design storm occurred.
- An emergency overflow should be provided for piped and storage features above the predicted water level arising from a 1% AEP rainfall event, inclusive of climate change and urban creep.
- Consideration and incorporation of flood resilience measures up to the 0.1% AEP event.
- Produce and implement robust emergency (evacuation) plans for major developments.
- Increase awareness and promote sign-up to the EA Flood Warnings within the Melton borough.

10.3 Requirements for Level 2 SFRA

Following the application of the sequential test, if sites cannot be appropriately accommodated in low-risk areas, MBC will apply the NPPF's exception test. In these circumstances, a Level 2 SFRA may be required, to assess in more detail the nature and implications of the flood characteristics.

Appendices

A MBC's Mapping Portal Guide

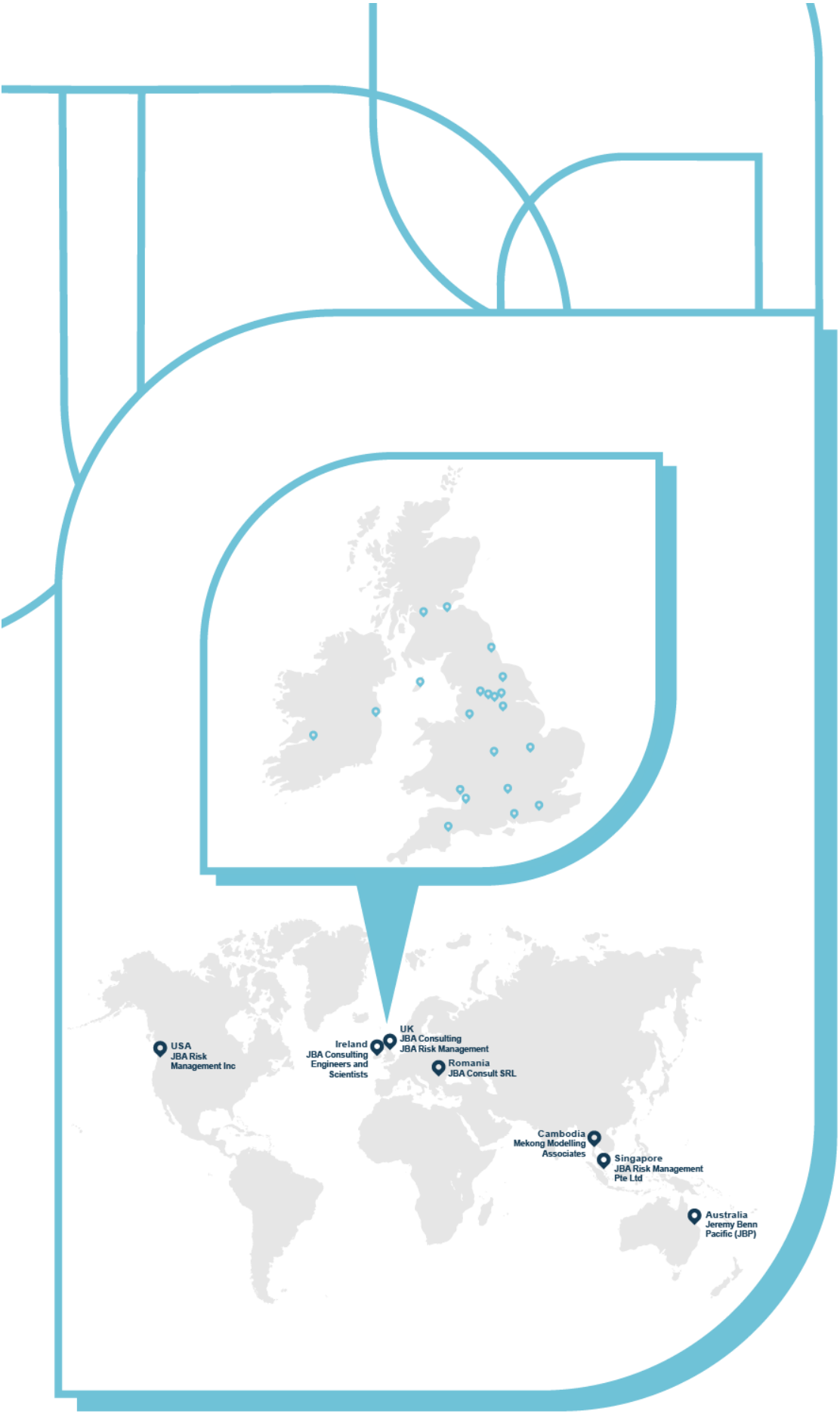
B Data Sources used in this SFRA

C SFRA User Guide

D Flood Alerts and Flood Warnings

E Summary of Flood Risk across Melton borough

F Cumulative Impact Assessment (CIA)



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