

# Appendix F - Cumulative Impact Assessment

## 1 Background

### 1.1 Introduction

The cumulative impact of development should be considered at both the Local Plan making stage and the planning application and development design stages. Paragraph 166 of the National Planning Policy Framework (NPPF, 2023) states:

*'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.'*

When allocating land for development, consideration should be given to the potential cumulative impact of the loss of floodplain storage volume. Whilst the loss of storage for individual developments may only have minimal impact on flood risk, the cumulative effect of multiple developments may be more severe. There are also risks of development causing modified flow regimes from sites creating an alignment in peak flows in downstream watercourses and resulting in greater flood risk as a result of the development.

Conditions imposed by Melton Borough Council should allow for mitigation measures so any increase in runoff as a result of development is properly managed and should not exacerbate flood risk issues, either within, or outside of the Councils' administrative area.

The cumulative impact of development should be considered at both the Local Plan making and the planning application and development design stages. Appropriate mitigation measures should be undertaken to ensure flood risk is not exacerbated, and where possible the development should be used to reduce existing flood risk issues.

To understand the impact of future development on flood risk in Melton borough, catchments were identified where development may have the greatest potential effect on flood risk, and where further assessment would be required within a Level 2 Strategic Flood Risk Assessment (SFRA) or site-specific Flood Risk Assessment (FRA). To identify the catchments at greatest risk, various factors were considered, including the potential change in developed area within each catchment and communities sensitive to increased risk of surface water and fluvial flooding, alongside evidence of historic flooding incidents. Where catchments have been identified as sensitive to the cumulative impact of development, the assessment sets out planning policy recommendations to help manage the risk.

## 1.2 Assessment of Cross-Boundary Issues

Figure 1-1 shows the neighbouring authorities and the main cross boundary rivers.

The central and southern areas of the Borough are drained by the River Wreake and its tributaries, including Gaddesby Brook. These watercourses originate in the higher elevations in the northwest of the Borough and within Harborough District and flow through the Borough in a westerly direction into Charnwood District.

The northern area of the Borough lies at a lower elevation and is drained by the River Devon which originates within the Borough, flowing in a northerly direction into Newark and Sherwood District.

Future development, both within and outside of the study area, as well as climate change, have the potential to affect flood risk to existing development and the surrounding areas through increased runoff, depending on the effectiveness of SuDS and drainage implementation. The key consideration for Melton borough is the potential for development within the Borough to impact downstream flood risk.

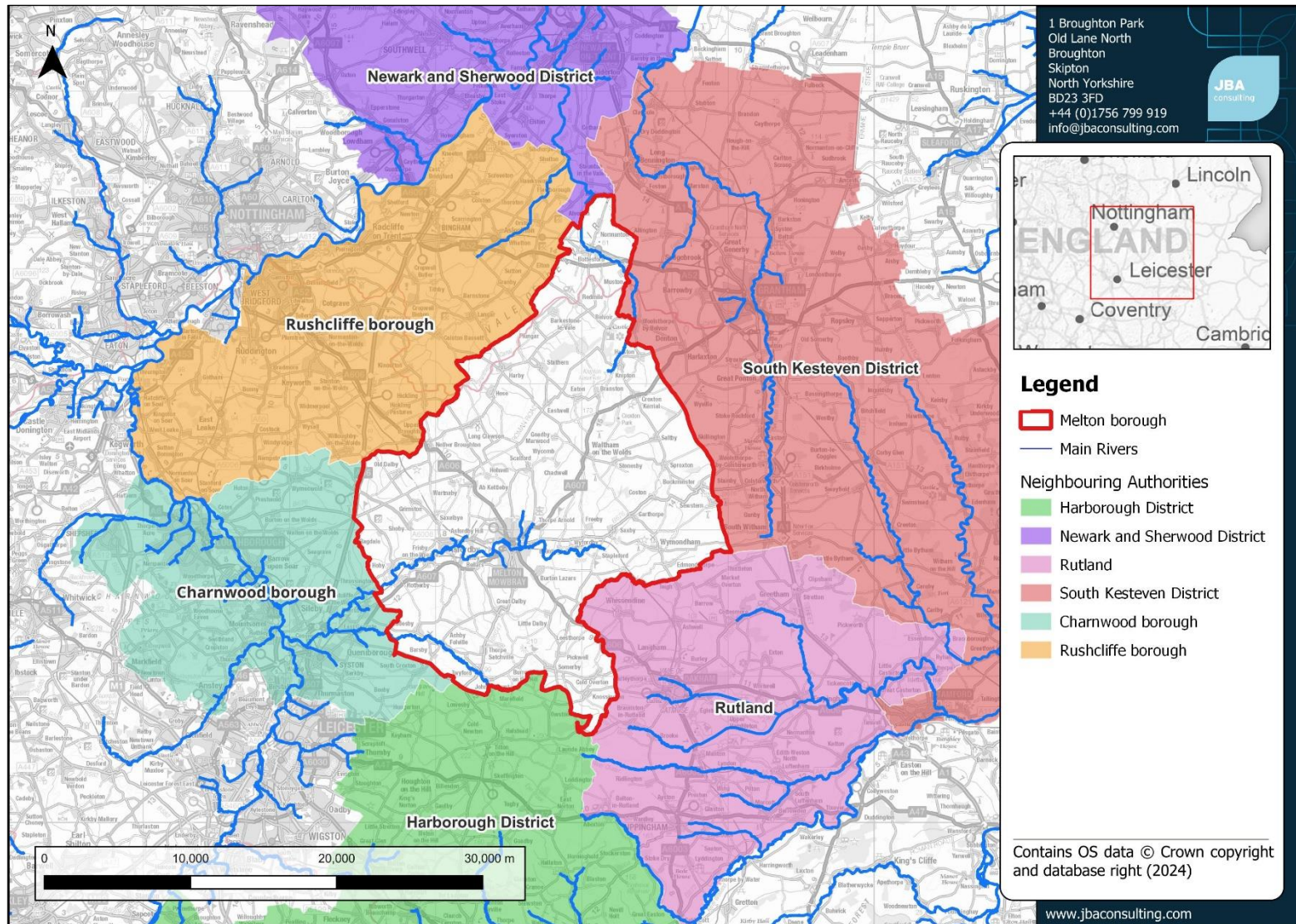


Figure 1-1: Neighbouring authorities to Melton borough.

## 2 Cumulative Impact Assessment

### 2.1 Methodology

For the Cumulative Impact Assessment (CIA), Melton borough was assessed at a catchment level using the Water Framework Directive (WFD) catchments, with these catchments shown in Figure 2-1. There are a total of 32 WFD catchments which fall within the Borough to some extent, however, five of these have less than 5% of their area within the Borough, are not areas with proposed development allocations within the Borough, and drain out of the Borough, so these were therefore removed from the assessment:

- Soar from Rothley Brook to Long Whatton Brook
- Chater-Upper
- Foston Beck
- Fairham Brook Catchment (trib of Trent)
- Whipling from Rundle Beck to Smite

There are four stages to the Level 1 CIA:

1. Assess sensitivity to fluvial and surface water flood risk.
  - This will be assessed by calculating the change in the building area shown to flood from the 1% AEP to the 0.1% AEP events for fluvial and surface water flooding respectively, given as a percentage of the total building area in the catchment.
2. Identify historic flooding incidents.
  - Identify the total number of historic flooding incidents within each catchment.
3. Assess the catchments with the highest degree of proposed new development.
  - This will be assessed by calculating the percentage area of each catchment covered by proposed development.
4. Identify the catchments at greatest risk.
  - Rank catchments in each category.
  - Discussion of catchments which are at high risk in all categories/individual categories.
  - Policy recommendations for developments in higher risk catchments.
  - Identify catchments needing further consideration within a Level 2 SFRA (if required).



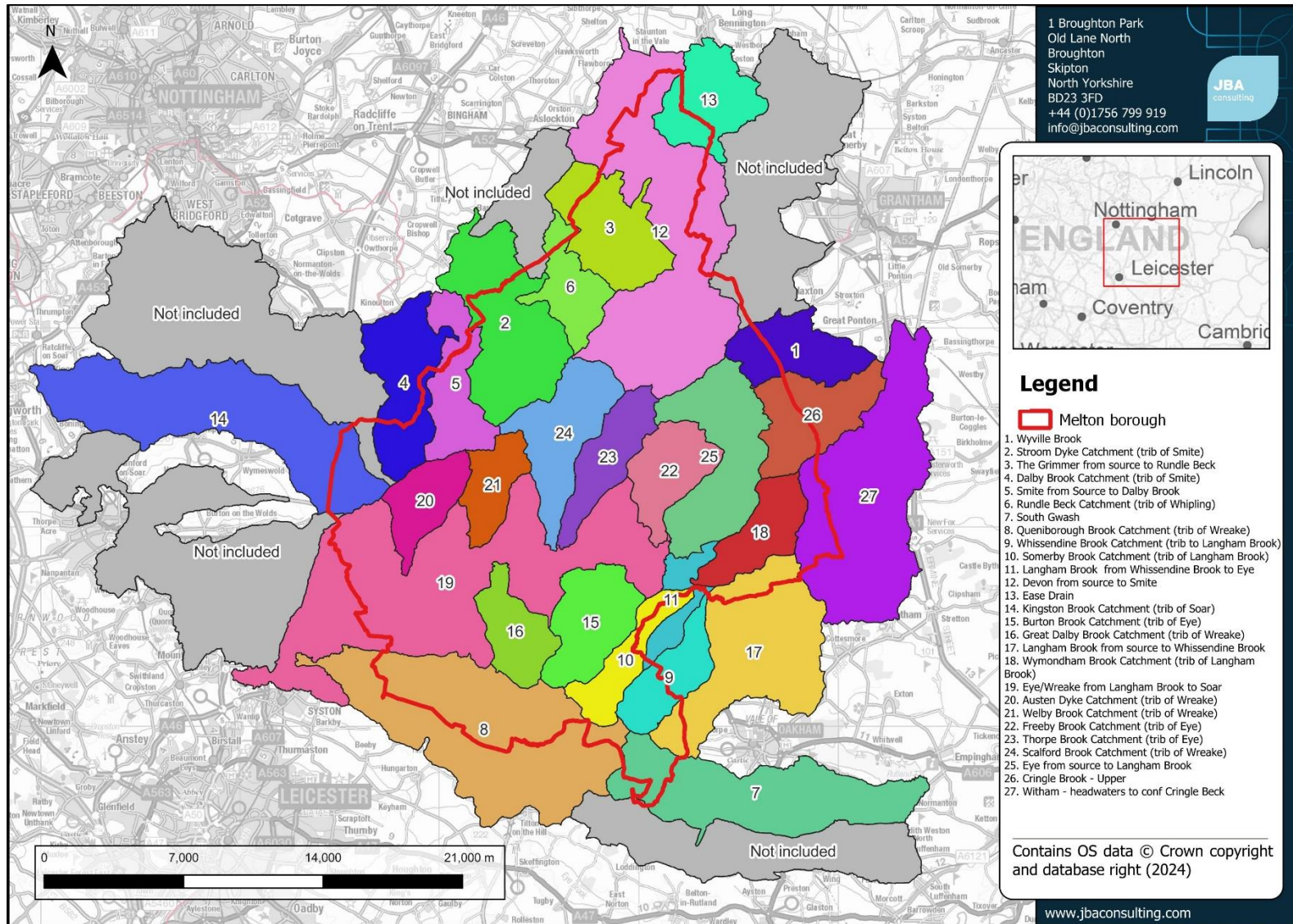


Figure 2-1: WFD Catchments across Melton borough.

Table 2-1 summarises the datasets used within the Melton CIA.

Catchments within the study area were ranked on four metrics: sensitivity to increased fluvial flood risk, sensitivity to increased risk of surface water flooding, prevalence of recorded historic flood incidents (limited by the data available), and area of new development proposed within the catchment.

The final results of this assessment gave a rating of low, medium, or high risk for each metric, for each catchment within the study area, the boundaries of which were derived from the WFD. The rating of each catchment in each of these assessments was combined to give an overall ranking.

Table 2-1: Summary of datasets used within the Broadscale CIA.

Dataset	Coverage	Sources of Data	Use of Data
Catchment boundaries	Melton borough and neighbouring authorities	Water Framework Directive Catchments	Assessment of susceptibility to cumulative impacts of development by catchment
OS Open Zoomstack Local Buildings	Melton borough and neighbouring authorities	Ordnance Survey (Open Source)	Built area for the assessment of flood risk
Risk of Flooding from Surface Water	Melton borough and neighbouring authorities	EA	Assessing the built area at risk of surface water flooding within each catchment
Fluvial Flood Zones 2 and 3a	Melton borough and neighbouring authorities	EA Flood Map for Planning	Assessing the built area at risk of fluvial flooding within each catchment
Future development areas (recently built out sites/sites under construction/sites with planning permission/previously allocated sites/currently allocated sites)	Melton borough and neighbouring authorities	Melton borough and neighbouring authorities	Assessing the impact of proposed future development on risk of flooding

Dataset	Coverage	Sources of Data	Use of Data
Historic flooding incidents	Melton borough	Melton Borough Council Leicestershire County Council	Assessing incidences of historic flooding within the study area

### 2.1.1 Sensitivity to increases in fluvial flooding

This is the measure of the increase in the built area at risk of fluvial flooding from the 1% AEP event to the 0.1% AEP event. It is an indicator of where local topography makes an area more sensitive to increases in flood risk that may be due to any number of reasons, including climate change, new development etc. It is not an absolute figure or prediction of the impact that new development will have on flood risk.

The OS Open Zoomstack Local Buildings layer was used to identify the built area within the catchments as this is an open data source which provides full coverage of the Borough and cross boundary catchments.

The buildings layer was intersected with the 1% and 0.1% AEP fluvial flood extents separately to determine the built area flooded in each catchment, in each flood extent. The difference between the two values was then taken as a percentage of the total built area within the catchment to allow comparison between catchments of different sizes.

### 2.1.2 Sensitivity to increases in surface water flooding

This is the measure of the increase in the built area at risk of surface water flooding in a 1% AEP event to a 0.1% AEP event and follows the same process as for fluvial flood risk, see Section 2.1.1 for further details.

### 2.1.3 Growth in the area

Site allocations were provided by Melton Borough Council and the neighbouring authorities. The only authority area where sites were not available is Newark and Sherwood District. However, the border between Melton and Newark and Sherwood is limited and the cross-boundary catchments drain north out of the Borough in this area so this will have limited impacts upon the cumulative impacts within Melton borough.

Melton Borough Council provided sites from their Strategic Employment Land Availability Assessment (SELAA) and also their Southern Sustainable Neighbourhood (SNN) allocation masterplan area which have been incorporated into this assessment.

At this stage the whole area of each development was considered, with no land use assumptions for the development areas.

#### 2.1.4 Historic flood risk

Melton Borough Council provided records of flooding incidences across the Borough. These include records of flooding and properties which had been awarded flood grants based on reported flooding. Leicestershire County Council also provided a GIS dataset showing flooding incidences across the Borough. No historic flooding data was made available for the other neighbouring authorities. Therefore, historic events in catchments that cross these local authorities' boundaries are unknown.

Details of historic flood events can be found in Section 4.1 of the main SFRA report. The historic data was represented as point data, where each point represents a location where it is known there has been at least one flood event (however, the nature and scale of these flood events varies significantly).

A count of each historical flood incident was conducted for each catchment to determine the historic flood risk within the catchments. Where over 50% of the catchment lies outside Melton borough, where historic flooding data was not available, the historic assessment result was not included in calculating the overall ranking for the catchment. The historic assessment was therefore excluded from the following catchments:

- Wyville Brook
- Dalby Brook Catchment (trib of Smite)
- South Gwash
- Queniborough Brook Catchment (trib of Wreake)
- Whissendine Brook Catchment (trib of Langham Brook)
- Ease Drain
- Kingston Brook Catchment (Trib of Soar)
- Langham Brook from Source to Whissendine Brook
- Cringle Brook - Upper
- Witham - headwaters to conf Cringle Bk

#### 2.1.5 Ranking the results

The results for each assessment were ranked into high, medium, and low risk as shown in Table 2-2. Ranking delineations were given at natural breaks in the results.

The ranking results were combined from all four assessments (except for the historic assessment for some catchments as discussed in Section 2.1.4) to give an overall high, medium, and low ranking for all catchments within Melton borough. Each catchment was assigned a score for each assessment based on its ranking (high = 3, medium = 2, low = 1) and these were then averaged to produce a final score and ranking. Any catchment producing an overall score of 2 or greater was considered high risk.

There is currently no national guidance available for assessing the cumulative impacts of development. These rankings provide a relative assessment of the catchments within Melton borough and are not comparable across other boroughs/districts. The thresholds used have been based on natural breaks in the data and professional judgement.



Table 2-2: Ranking assessment criteria

Flood risk ranking	Percentage of increased building area at risk of fluvial flooding	Percentage of increased building area at risk of surface water flooding	Total number of historic flooding incidents	Percentage area of catchment covered by new development
Low risk	<1	<3	<5	<1
Medium risk	<=5, >=1	<=4.5, >=3	<=9, >=5	<=4, >=1
High risk	>5	>4.5	>90	>4

## 2.2 Overall rankings

A Red-Amber-Green (RAG) rating was applied to the catchments, with red being high risk, amber being medium risk, and green being low risk. The RAG ratings are shown in Table 2-2. The catchments with an average score of greater than or equal to 2 were deemed high risk.

The following catchments are identified as high risk:

- 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)

The results of the RAG assessments are shown in Figure 2-2.

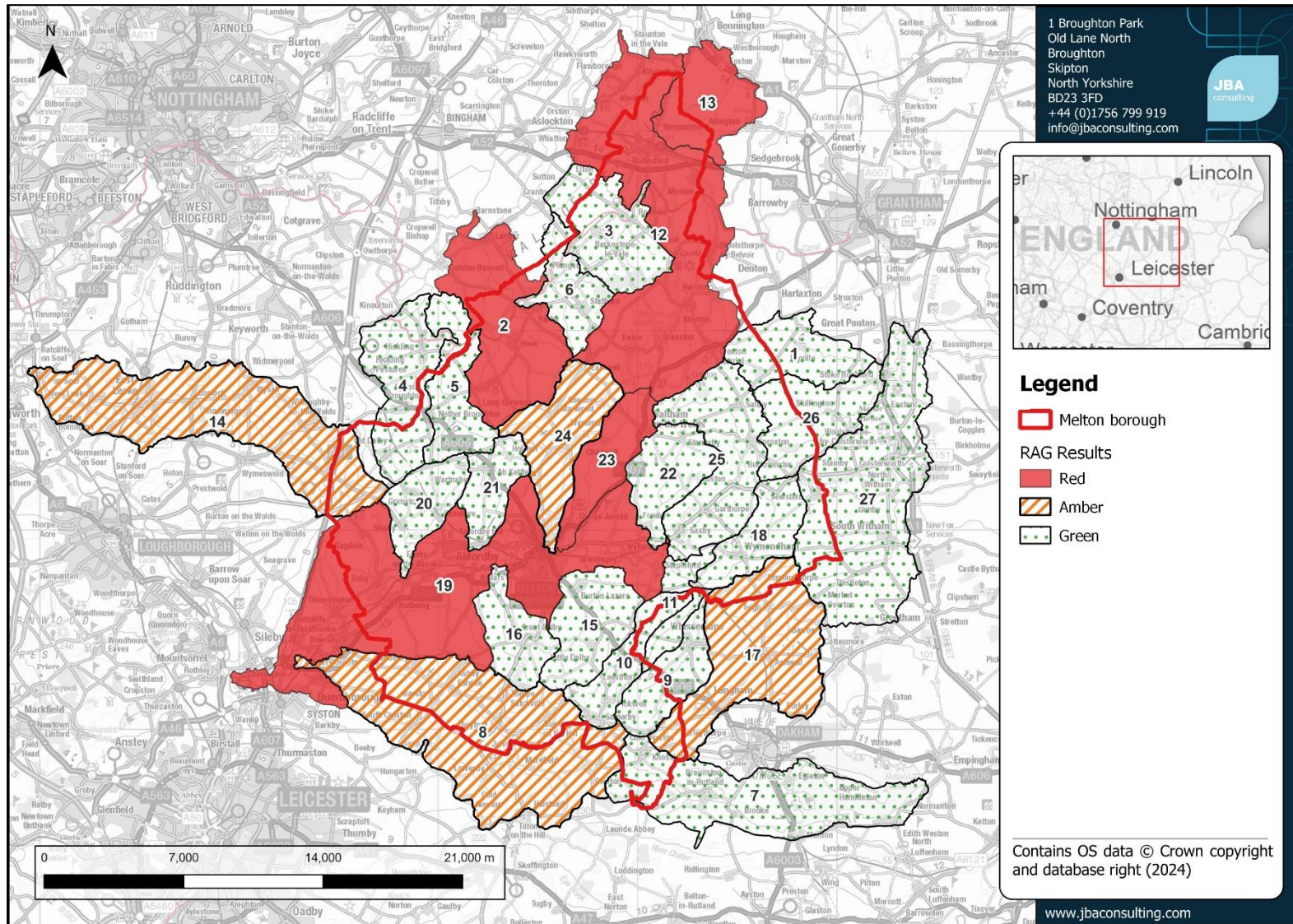


Figure 2-2: Results of the RAG assessment for Melton borough.

### 3 Level 1 SFRA Policy recommendations

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.

The high-level CIA for Melton borough has highlighted areas where there is the potential for development to have a cumulative impact on flood risk. Catchments have been identified as high, medium, or low risk, relative to the other catchments within the Borough.

Flood risk can be affected by several different factors, which have been assessed as part of the CIA. As a result, incremental action, and betterment in flood risk terms across all of the Borough should be supported where possible.

Broadscale policy recommendations are set out in Section 7.2 of the main SFRA report.

Specific policy recommendations for high and medium risk catchments are set out in Section 7.3 of the main SFRA report.