Mid Sussex District Council Level 2 Strategic Flood Risk Assessment

August 2024

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1 Introduction

Mid Sussex District covers an area of approximately 334km^2 comprising of 24 parish and town council areas. It has an estimate population of 152,000. The district contains three towns – Burgess Hill, East Grinstead and Haywards Heath which account for around two third of the population. It also contains a number of large villages, small villages and hamlets.

Mid Sussex forms the upper catchment of four main river catchments: the Mole, Medway, Adur and Ouse. Due to the district's location within these catchments very few Main Rivers are located within the District.

1.1 Purpose of the Strategic Flood Risk Assessment

Paragraph 160 of the National Planning Policy Framework (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 impact 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."

This SFRA report provides a Level 2 assessment of sites identified for proposed allocation within the Mid Sussex District Plan and was prepared in accordance with the 2023 National Planning policy Framework (NPPF) and the August 2022 Planning Practice Guidance (PPG).

The report should be read alongside the Level 1 SFRA published for Mid Sussex District Council in 2024.

1.2 Level of SFRA, Planning Policy Guidance

The Planning Practice Guidance advocates a staged approach to risk assessment and identifies the following two levels of SFRA:

- Level One: where flooding is not a major issue in relation to potential development sites and where development pressures are low. The assessment should be sufficiently detailed to allow application of the Sequential Test.
- Level Two: where land outside of flood risk areas cannot appropriately accommodate all the necessary development creating the need to apply the NPPF's Exception Test. In these circumstances the assessment should consider the detailed nature of the flood characteristics within a flood risk area and should include all sources of flooding.

1.3 SFRA objectives

The objectives of this Level 2 SFRA are to:

- Assess the flood risk to proposed sites using the latest available flood risk data and climate change uplifts where available
- Provide information and mapping to show flood risk from all sources for each site option.
- Provide recommendations for making the site safe from flooding throughout its lifetime where the Exception Test is required
- Take into account, as far as practically possible the most recent policy and legislation in the NPPF, PPG and LLFA SuDS guidance.

1.4 National Planning Policy and Guidance

The Revised National Planning Policy Framework (NPPF) was updated in December 2023. The NPPF sets out Government's planning policies for England and how these are expected to be applied. The Framework is based on core principles of sustainability and forms the national policy framework in England, also accompanied by a number of Planning Practice Guidance (PPG) notes. It must be taken into account in the preparation of local plans and is a material consideration in planning decisions.

1.5 Flood Risk and Coastal Change (PPG)

An updated version of the PPG guidance was published in August 2022. This advises on 'how to take account of and address the risks associated with flooding and coastal change in the planning process'. The guidance outlines the steps required when preparing strategic policies. Further details regarding the PPG can be found in the Level 1 SFRA.

1.6 The Sequential Test

The Sequential Test aims to ensure that areas of little or no flood risk are prioritised for development over areas at a higher risk of flooding. This means areas at a medium or high risk of flooding from any source, now or in the future should be avoided for development where possible.

1.7 The Exception Test

It may not always be possible for all new development to be allocated 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.

The Exception Test should only be applied following the application of the Sequential Test. It applies in the following instances, where it is not possible for development to be located in areas with a lower risk of flooding:

- More vulnerable in Flood Zone 3a
- Essential infrastructure in Flood Zone 3a or 3b
- Highly vulnerable in Flood Zone 2 (this is NOT permitted in Flood Zone 3a or 3b)
- Locations where surface, groundwater, sewer or reservoir flood risk materially affect the safety of proposed development or where development proposals potentially affect existing land or property.

1.8 Use of SFRA data

This SFRA has been developed using the best available information, supplied at the time of preparation. This relates both to the current risk of flooding from rivers, the sea, surface water and groundwater and, where available, the potential effects of future climate change.

Datasets used to inform this SFRA may be updated following the publication of this SFRA and new information on flood risk may be produced by Risk Management Authorities. This new information (such as updated mapping and modelling) may supersede the information included in this SFRA. Guidance should be sought from West Sussex County Council, the Environment Agency and Chichester District Council as appropriate to check the most up to date source of information is used for future flood risk assessment.

2 Data sources

The main aim of the Level 2 SFRA is to provide an overview of the actual flood risk affecting development included in the District Plan 2021-2039. In this context, actual flood risk is

defined as the predicted flooding expected including with the effect of flood defences and other flood risk management measures in place. The following section outlines sources of data used and categorisation criteria for different sources of flood risk. Mapping of all flood risks is included in Appendix 1 of this report.

For areas that are partially affected by flood risk it is possible that development can be implemented in line with guidance by using a sequential approach. This involves incorporating the less vulnerable aspects of the development (according to the Environment Agency's flood risk vulnerability classification) in the areas at risk of flooding.

2.1 Flood Zones

Flood Zones 2, 3a and 3b (functional floodplain) have been taken from the Flood Zones derived in the Level 1 SFRA, which incorporated the Environment Agency's Flood Map for Planning. At the time of writing this is considered up-to-date, however over time the online Flood Map for Planning is likely to be updated more often than the SFRA.

It is important to note that the Flood Map for Planning does not identify the functional floodplain (Flood Zone 3b) and the SFRA flood zones will remain the best available data for identifying this. In locations where there is no detailed modelling available, we have adopted a precautionary approach by considering the maximum extent of Flood Zone 3a as an 'indicative' Flood Zone 3b. In these locations, detailed modelling will be required to identify the extent of the functional floodplain.

2.2 Flood defences

For sites where existing flood defences provide a reduction in the flood risk to the site, it is important to understand the standard of protection these structures and measures provide. It is also necessary to understand how this level of protection changes over time, considering the implications of climate change.

If flood defences are required to protect a development site, evidence will be required to show that the new development does not adversely impact and increase flood risk to other areas, for example that there is no net loss in floodplain storage in circumstances where this is a material consideration. It will need to be established that these defences can be appropriately managed and maintained during the lifetime of the development. In some cases it will be a requirement to demonstrate that there is an appropriate level of commitment to the maintenance of the standard of protection afforded by existing defences, where reliance is placed on the standard they provide.

Current flood defences have been taken from the Environment Agency's Asset Information Management System (AIMS) Spatial Defences data set. Their current condition and standard of protection are based on those recorded in the tabulated shapefile data. The Council's asset register was also obtained in the Level 1 SFRA.

2.3 Flooding from rivers

Fluvial flood risk is notable throughout the district, particularly along the principal watercourses. Several other smaller watercourses and field drains are also located in the district and have the potential to pose significant flood risk to development. Commentary of water features in or near to the sites are based on visual inspection of Open Street Maps Standard mapping and the Environment Agency catchment data explorer.

2.3.1 Impact of climate change on flood risk

Climate change is expected to increase the peak flows of rivers, meaning that flows which were previously thought to be extreme will now be considered far more possible. Areas

benefiting from flood defences will find the standard of protection changes over time with overtopping of defences more likely unless they are upgraded.

Peak river flow climate change allowances developed by the Environment Agency are divided into a series of Management Catchments (Figure 1), four of which fall within Mid Sussex district. Climate change allowances for the four Management Catchments are displayed in Table 1.

Figure 1 Management catchment boundaries

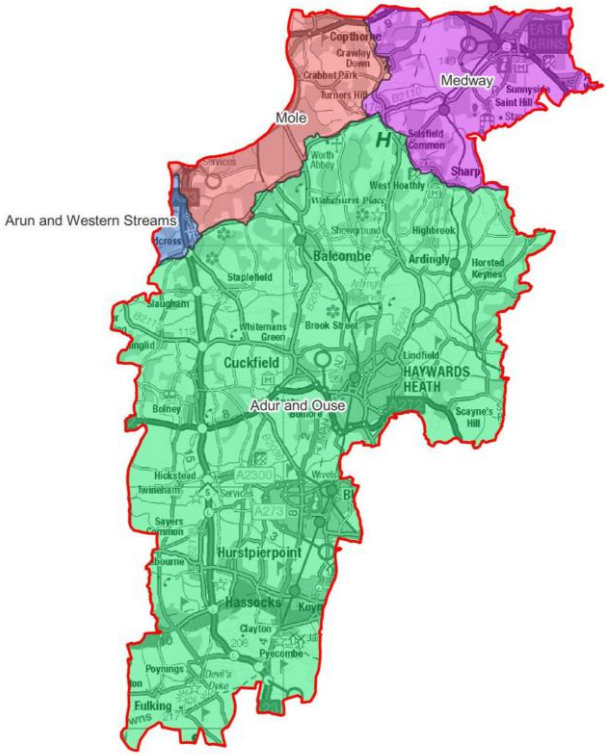

Table 1 Management Catchment peak river flow climate change allowances

Adur and Ouse Management Catchment peak river flow allowances			
Epoch	Central	Higher Central	Upper
2020s	16%	23%	40%
2050s	18%	28%	57%
2080s	37%	55%	107%
Arun and Western Streams Management Catchment peak river flow allowances			
Epoch	Central	Higher Central	Upper
2020s	11%	16%	27%
2050s	13%	19%	36%
2080s	25%	36%	64%
Medway Management Catchment peak river flow allowances			
Epoch	Central	Higher Central	Upper
2020s	14%	19%	29%
2050s	15%	21%	37%

2080s	27%	37%	62%
Mole Management Catchment peak river flow allowances			
Epoch	Central	Higher Central	Upper
2020s	11%	16%	27%
2050s	6%	12%	26%
2080s	12%	20%	40%

2.4 Surface water flooding

The EA Risk of Flooding from Surface Water (RoFSW) mapping dataset shows potential extent, depth and velocity for the 30-year, 100-year and 1000-year events. The mapping uses generalised assumptions on the performance of local drainage systems and no particular flood defences for surface water flooding have been identified or included in the consideration of the protection to any of the sites assessed in this Level 2 SFRA.

2.4.1 Impact of climate change on surface water flooding

Climate change is predicted to result in wetter winters and increased summer storm intensity in the future. This increased rainfall intensity will affect land and urban drainage systems, resulting in surface water flooding, due to the increased volume of water entering the systems. The potential impacts of surface water plus climate change may need to be considered at site-specific assessment stage.

Peak rainfall climate change allowances developed by the Environment Agency are divided into the same Management Catchments as peak river flows. Climate change allowances for the four Management Catchments are displayed in

Table 2 Management Catchment peak rainfall climate change allowances

Catchment	**Allowance Category**	3.3% AEP '2050s' (up to 2060)	3.3% AEP '2070s' (up to 2125)	1% AEP '2050s' (up to 2060)	1% AEP '2070s' (up to 2125)
Adur and Ouse Management Catchment	Central	20%	35%	20%	25%
	Upper End	20%	40%	45%	45%
Catchment	**Allowance Category**	3.3% AEP '2050s' (up to 2060)	3.3% AEP '2070s' (up to 2125)	1% AEP '2050s' (up to 2060)	1% AEP '2070s' (up to 2125)
Arun and Western Streams Management Catchment	Central	20%	25%	20%	25%
	Upper End	35%	40%	45%	45%
Catchment	**Allowance Category**	3.3% AEP '2050s' (up to 2060)	3.3% AEP '2070s' (up to 2125)	1% AEP '2050s' (up to 2060)	1% AEP '2070s' (up to 2125)
Medway Management Catchment	Central	20%	20%	20%	20%
	Upper End	35%	35%	45%	40%

Catchment	Allowance Category	3.3% AEP '2050s' (up to 2060)	3.3% AEP '2070s' (up to 2125)	1% AEP '2050s' (up to 2060)	1% AEP '2070s' (up to 2125)
Mole Management Catchment	Central	20%	20%	20%	25%
	Upper End	35%	35%	40%	40%

2.5 Groundwater flooding

The majority of the Mid Sussex area is considered to have low potential for groundwater flooding as a result of underlying geology. Groundwater concerns are most prevalent in the south of the district where permeable chalk geology can be found, and consequently a high risk of groundwater flooding is identified in mostly rural areas and Hassocks parish. However those areas are located within those areas of the district within the South Downs National Park and therefore do not fall within the scope of the Strategic Flood Risk Assessment work carried out by the Council.

Description of the superficial and bedrock geology for each site is based on the British Geological Society 50k GeoIndex Web Mapping Service.

2.5.1 Impact of climate change on ground water flooding

There is currently no guidance regarding the impacts of climate change on groundwater flooding.

The effect of climate change on groundwater flooding, and those watercourses where groundwater has a large influence on winter flood flows is more uncertain. Milder wetter winters may increase the frequency of groundwater flooding incidents in areas that are already susceptible, but warmer drier summers may counteract this effect by drawing down groundwater levels to a greater extent during the summer months.

As this occurs when the water table rises after significant long duration rainfall events, typically occurring over several weeks or months and receding very slowly, the increased regularity of wet winters could result in increased risk of groundwater flooding, particularly in the winter and spring months. Mean groundwater levels are not expected to change significantly as the predicted wetter winters would be offset by drier summers. However, increased rainfall *intensity* due to climate change is considered unlikely to increase the risk of groundwater flooding.

2.6 Reservoirs

The risk of inundation as a result of reservoir breach or failure of a number of reservoirs within the area has been identified from the Environment Agency's Reservoir Flood Extents dataset.

The Environment Agency Reservoir Flood Extents data consists of flood extents for two scenarios; a "dry-day" and "wet-day". The dry day scenario shows flood extents in the event that reservoirs were to fail and release the water they hold when local rivers are at normal levels. The wet day scenario shows flood extents in the event that reservoirs were to fail and release the water they hold when local rivers are in flood.

2.7 Flood warning

Flood Warning Areas and Flood Alert Areas are represented by the Environment Agency's Flood Alert Area dataset.

2.8 Historic flooding

The Environment Agency's 'Historic Flood Map' and 'Recorded Flood Outlines' datasets have been used to understand whether historic flooding has been recorded at the sites. Both datasets take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding.

Mid Sussex District Council's Flood Incident Database has also been reviewed. As specified in the Level 1 SFRAs, there is a history of documented flood events within the district, with the main sources recorded as being fluvial, surface water and sewer flooding.

It is important to note that the absence of historic flood records does not mean that an area has never flooded, only that records are not held. For previously undeveloped sites, it is likely that historic flooding incidents may have gone unreported due to a lack of site use or interest. In addition, it is also possible that flooding mechanisms have changed since the date of a recorded flooding incident, making it more or less likely for flooding to occur on site.

2.9 Sewer flooding

Southern Water and Thames Water provided extracts from their Sewer Flooding Register for the purposes of the SFRA Level 1 (discussed in Section **Error! Reference source not found.**). It should be noted that these are flooding incidents that have been reported to Thames Water or Southern Water by the homeowners. This will not account for any incidents that have not been reported and therefore do not show on the register. Therefore, these records are not extensive. An absence of records does not indicate that an area has not been flooded historically. This information should be used to identify an issue that would need resolving before further development could proceed in that location, rather than identifying a location where further development would not be allowed.

2.10 Residual risk

The residual flood risk to sites is identified as where potential blockages or overtopping/ breach of defences could result in the inundation of a site, with the sudden release of water with little warning.

Residual risk from breaches to flood defences, whilst rare, needs to be considered in Flood Risk Assessments. 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.

2.11 Depth, velocity and hazard to people

The Level 2 assessment seeks to map the probable depth and velocity of flooding as well as the hazard to people during the defended pluvial 100-year (1% AEP) plus climate change flood event. This assessment is made to help inform the Exception Test.

During a flood event, the water depth and velocity can vary considerable across flooded areas. It is therefore important to identify which areas are more likely to be hazardous to people and to try to locate high vulnerability developments in areas with a lower hazard. This is important for emergency planning to identify dry route access and egress during a flood event. On of the output from this is the flood hazard mapping which categorises the danger to people for different combination of flood water depth and velocity. The derivation of these categories is based on the methodology set out by Defra in Flood Risk Assessment Guidance for New Development. Developers should also test the impact of climate change depths, velocities, and hazard on the site, as part of the site-specific Flood Risk Assessment.

Table 3 Flood risk to people classifications

Flood Hazard		Description
Low	HR < 0.75	Caution – Flood zone with shallow flowing water or deep standing water
Moderate	0.75 ≥ HR ≤ 1.25	Dangerous for some (i.e. children) – Danger: flood zone with deep or fast flowing water
Significant	1.25 > HR ≤ 2.0	Dangerous for most people – Danger: flood zone with deep fast flowing water
Extreme	HR > 2.0	Dangerous for all – Extreme danger: flood zone with deep fast flowing water

As part of a site-specific FRA, developers may need to undertake more detailed hydrological and hydraulic assessments of the watercourses to verify flood depth, velocity and hazard based on the relevant 100-year plus climate change event, using the relevant climate change allowance based on the type of development and its associated vulnerability classification. Not all this information is known at the strategic scale.

3 Level 2 site assessment

Site summary tables are included for 18 of proposed allocation sites with a risk of flooding in Appendix 1 including recommendations for further evaluation and management of flood risk at each of the sites. An overview of the flood risk and recommendations for management of flooding when development is brought forward is included as follows.

Notwithstanding the recommendations of this Level 2 SFRA, site-specific assessments will need to be undertaken in accordance with the latest policy, guidance and flood risk, defence information and information in the SFRA. Developers should, where required, undertake more detailed hydrological and hydraulic assessments of the watercourses to verify flood extent (including latest climate change allowances), to inform the sequential approach within the site and demonstrate, as required that the Exception Test is satisfied.

4 Guidance for proposed development including windfall sites

4.1 Main river and Ordinary watercourse

Where the site either includes or borders a Main River (including a culverted reach of Main River), an easement of 8m is required from either bank for access and maintenance. Any future development will require a flood risk permit from any activity within 8m of a Main River.

If an ordinary watercourse is within or immediately adjacent to the site area, consultation with the Lead Local Flood Authority should be undertaken. If alterations or discharges are proposed to the watercourse, a land drainage consent will be required.

4.2 Hydraulic modelling

For sites not represented in the Environment Agency's Flood Zones, or where Flood Zones do exist, but no detailed hydraulic modelling is present, it is recommended that developers construct detailed hydraulic models at these sites as part of a site-specific FRA using channel, structure and topographic survey, to confirm flood risk. This representation may be absent as Flood Zones do not extend into a watercourse any further than the point where the upstream catchment is less than 3km^2.

4.3 Access and egress

The provision of safe access and egress should be considered at all development sites for all sources of flooding, both onsite and in the vicinity of the site. For example, a development site may have low surface water flood risk, but areas of high risk offsite may lead to access and egress to and from the site being restricted for vehicles and/or people.

The ability for emergency vehicles to access and exit the site must be maintained.

4.4 Surface water risk

Surface water risk should be considered in terms of the proportion of the site at risk in the 30-year, 100-year or 1,000-year events, whether the risk is due to isolated minor ponding or deeper pooling of water, or whether the risk is due to a wider overland flow route.

Surface water risk and mitigation should be considered as part of a detailed site-specific Flood Risk Assessment and Surface Water Drainage Strategy.

Surface water drainage routes must be preserved in perpetuity, including both flow routes shown in surface water modelling and existing drainage ditches and smaller watercourses. Where flow routes are altered due to changes in ground levels on the site, it is important that the site-specific FCA includes an assessment of the impact on and offsite, with suitable mitigation provided.

4.5 Residual risk

Residual risk should be considered for all development sites that are located within areas benefitting from flood defences, within modelled reservoir breach extents or where other flood risk mitigation measures are in place or proposed as part of development.

4.6 Contamination

If a site is located within 250m of a current or historic landfill site, there could be amenity, dirt and contamination issues. Sites could be sensitive from the perspective of controlled waters and therefore any redevelopment must ensure there is no pollution risk to the water environment.

4.7 High groundwater

The potential effects on the capacity of watercourses and drainage systems potentially affected by future increases in groundwater levels should be assessed and appropriately addressed.

4.8 Long-term water level management

In locations where reliance is placed on water levels in watercourses and water bodies, consideration must be given to the arrangements required for long term water level management, particularly with respect to the potential effects of sea level rise. These arrangements require a strategic understanding of the risk and the commitment to long term management by the appropriate authorities.

5 Use of SFRA data and future updates

It is important to recognise that the SFRA has been developed using the best available information at the time of preparation. This relates both to the current risk of flooding from all sources and the potential impacts of future climate change.

The SFRA should be a ‘living document’, and as a result should be updated when new information on flood risk, flood warning or new planning guidance or legislation becomes

available. Additional guidance should be sought from WSCC, EA and Mid Sussex Flooding and Drainage teams to ensure the most up to date information is considered within any new assessments. Such information may be in the form of:

- New hydraulic modelling results
- Flood event information following a future flood event
- Policy/ legislation updates
- Environment Agency flood map updates
- New flood defence schemes, or alleviation schemes.

The Environment Agency regularly reviews their flood risk mapping, and it is important that they are approached to determine whether updated information is available prior to commencing a detailed Flood Risk Assessment.

It is recommended that the SFRA is reviewed in line with the Environment Agency's Flood Zone map updates to ensure latest data is still represented in the SFRA, allowing a cycle of review and a review of any updated data by checking with the above bodies for any new information.

6 Neighbourhood Plans

Flood risk should be fully addressed in development plan preparation and in bringing forward policies for the allocation of land and therefore the SFRA findings should be used in the production of Neighbourhood Plans.

Neighbourhood planners can use the information in the Interim Level 1 and Level 2 SFRA on the sources of flood risk across the Mid Sussex area and the flood risk mapping, to assess the risk of flooding to sites within their community. The SFRA will also be helpful for developing community level flood risk policies in high flood risk areas.

Appendix 1 – Site Assessment Summary Tables