herrington

Part of eps

In partnership with:

Medway Council

Strategic Flood Risk Assessment

Medway Council

Medway Council
Gun Wharf
Dock Road
Chatham
Kent
ME4 4TR

Medway Council

Serving You

CANTERBURY | LONDON | CAMBRIDGE | BRISTOL | LEEDS

Tel 01227 833855
www.herringtonconsulting.co.uk

Strategic Flood Risk Assessment
Medway Council

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Written by	Checked by
1	0	Draft report	July 2018	KT, SB, AW, SR, SMB, SH, NW	KT and SMB
2	1	Revisions to text. Draft report. Issued for internal consultation.	January 2019	KT, SB, AW	KT and SH
3	2	Revisions to text. Final draft report issued for consultation.	May 2019	KT, SB	SMB
4	3	Revisions to text. Final report issued for external consultation.	January 2020	KT, TV, AW	KT and SMB
5	4	Revisions to text. Final report issued for external consultation.	April 2020	KT, AW	KT
6	5	Report updated in line with changes to policy and NPPF. Issued for internal consultation.	January 2025	AB	TV and AW
7	6	Report updated in line with changes to policy and NPPF. Issued for internal consultation.	May 2025	AB	AW

This page is left intentionally blank

Executive Summary

The National Planning Policy Framework (NPPF) and accompanying National Planning Practice Guidance (NPPG) both emphasise the responsibility of Local Planning Authorities (LPA's) to ensure that flood risk is understood, managed effectively and sustainably throughout all stages of the planning process. This Strategic Flood Risk Assessment (SFRA) identifies that Medway is at risk from a number of sources of flooding, with over 40km of coastline, low-lying marshland and the River Medway flowing through the area. It is therefore evident that flooding must be a key consideration for any future development within Medway.

The focus of this SFRA update is to address the changes since the previous SFRA was prepared in 2020, to bring the planning context and flood risk information up to date, and to reflect changes in policy and legislation. The SFRA is also intended to aid development policies to support the emerging Local Plan. The main objectives are as follows:

- To identifying the risk from each source of flooding at key locations within Medway.
- Outline the requirements of the Sequential Test and Exception Test.
- To state the requirements of a Flood Risk Assessment (FRA) and to provide guidance for developers on how to prepare a compliant FRA.
- To state the requirements in relation to surface water drainage and provide guidance for developers on how to complete the Sustainable Drainage (SuDS) proforma.
- Recommend Local Plan policies in relation to the management of flood risk.

This report is supplemented by a series of mapping, which provides information required to appraise the risk of flooding and includes the location of the key watercourses and defences, as well as historic records of flooding.

The Medway Towns are earmarked for future development, and the low-lying marshes to the north provide internationally important habitats. Both are at increasing risk of flooding due to climate change and future protection will therefore be dependent on flood and coastal risk management. Priority should be given to improving the standard of protection provided by defences over the lifetime of any development.

It should be recognised that at the time of publication, Medway Council is developing the emerging Local Plan. As such, the information contained within this report will help to support this process and the guidance in relation to the points stated above should be considered when developing any local planning policies relating to flood risk management.

Looking forward, the information contained within this report will assist the LPA to draft policies for use within the emerging Local Plan and provide developers with the guidance required to accurately

appraise the risk of flooding as part of a planning application. Notwithstanding this, it should also be acknowledged that the SFRA is a living document and as such, should be regularly updated to ensure that the most contemporary information in relation to flood risk is considered.

Contents Page

1. Scope of Appraisal

1.1. Drivers for the SFRA

The National Planning Policy Framework (NPPF) requires the Local Planning Authority (LPA) to apply a risk-based approach to the preparation of development plans with respect to potential flooding. This district-wide appraisal of flood risk is to be delivered through the Strategic Flood Risk Assessment (SFRA). Herrington Consulting has been commissioned by Medway Council to update the last revision of the SFRA which was prepared in 2020 and pre-dated the latest iteration of the NPPF in 2024. The latest version of the SFRA report has therefore been prepared in accordance with the requirements of the NPPF and as outlined within Paragraphs 9 and 10 of the *Planning Practice Guidance: Flood Risk and Coastal Change* (NPPG).

This study provides an up-to-date analysis of the main sources of flood risk across the administrative area, together with a detailed means of appraising development allocation sites and existing planning policies, against the risks posed by flooding over this coming century.

The predominant risk of flooding is from tidal sources (the River Medway and the coast). The defence infrastructure currently provides a varying level of protection to the areas of ecological importance across the low-lying land in the north of Medway, and the strategically important towns situated along the tidal River Medway. The centre of the district is in parts low lying, and the varied topography throughout the district can present a risk of surface water flooding to both rural and urban communities alike. Consequently, the focus of the SFRA is to provide a strategic overview of the risk of flooding from each of the main sources of flooding to enable informed spatial planning decisions to be made. In addition, this SFRA is aimed at providing developers with clear guidance on how to submit information relating to flood risk in support of planning applications.

Where this Level 1 SFRA identifies that strategic land allocation cannot be located outside flood risk areas, a Level 2 assessment is being prepared as a separate document to provide further information on these sites in relation to flood risk.

It is acknowledged that the way in which the risk of flooding is managed is constantly changing, with improved predictions relating to climate change and new planning policy reflecting the changes in relation to requirements for development. As such, it is imperative that the SFRA is adopted as a 'living' document and is reviewed regularly in light of emerging policy directives and an improving understanding of flood risk within Medway.

1.2. Key Updates Since 2020

There has been a number of key updates in national policy since the SFRA was prepared in 2020. An overview of the policies which are currently applicable is provided in Section 3.1 of this report. One of the key changes is the update to the National Planning Policy Framework (NPPF) released in December 2024. In addition, updates have been released to the Environment Agency's 'Flood map for planning' and surface water mapping in March 2025, as well as the requirements for a site-

specific Flood Risk Assessment in April 2025. The NPPF is accompanied by the National Planning Policy Guidance Suite (NPPG) which was released in August 2022 and now provides more detailed guidance on flood risk and coastal change.

Further to this, Paragraph 182 of the latest NPPF promotes the use of SuDS in areas at risk of flooding. In light of this, local guidance is also included within this SFRA to encourage all new development to manage surface water runoff sustainably.

Finally, datasets managed by the EA are now freely available, including data from flood modelling studies and aerial height data (LiDAR). The latest flood data released by the EA in this area include a numerical flood model of the River Medway (2019) and North Kent Coast (2018), which consider the impact of climate change on fluvial and tidal flood risk. The results from these modelling studies have been considered within this report.

1.3. Objectives of the 2025 SFRA

The key objectives of this SFRA are;

- to update the SFRA report to reflect changes in planning policy, guidance and data availability since the previous SFRA was prepared in 2020;
- provide an overarching appraisal of the risk of flooding across the district from all sources;
- inform the sustainability appraisal so that flood risk is taken into account when considering strategic land use policies;
- provide sufficient data and information to enable the Council to apply the Sequential Test to land use allocations and to identify whether the application of the Exception Test is likely to be necessary;
- to support the Council's policies for the management of flood risk within the Local Plan and to assist with the testing of site proposals;
- provide prescriptive guidance to developers on the requirements for managing the risk of flooding to a development, ensuring that development is sustainable into the future (i.e. in response to a changing climate) and, addressing the potential increased risk of flooding elsewhere as a result of development;
- consider the acceptability of flood risk in relation to emergency planning capability, and;
- consider opportunities to reduce flood risk to existing communities and developments through better management of surface water, provision for conveyance and of storage for flood water.

2. Background

2.1. Study Area

Located in the county of Kent, Medway comprises a Unitary Authority covering an area of approximately 268 square kilometres with a population of greater than 279,000. A map of Medway is provided in Figure 2.1 below, delineating the 5 main towns of Rainham, Gillingham, Chatham, Rochester and Strood. The more rural areas on the Hoo Peninsula and Isle of Grain are located in the north of Medway.

Figure 2.1 – Location map of Medway (Contains Ordnance Survey data © Crown copyright and database right 2025).

There are a number of areas which are of international importance, due to the habitats they provide for a variety of species of flora and fauna. To the southwest lies the North Downs Woodland Special Area of Conservation (SAC). There are also a number of other areas which are designated as Sites of Special Scientific Interest (SSSI). The Estuary and Marshes of the River Thames and Medway are designated as Special Protection Areas (SPA), Ramsar sites, and as a SSSI. The marshes comprise a unique tidal system which supports saltmarshes and grazing marshes and supports

various coastal habitats, particularly for wild birds. Further information on land designations can be found at;

https://magic.defra.gov.uk/MagicMap.aspx

2.1.1. Topography

Land levels across Medway range from 0m Above Ordnance Datum Newlyn (AODN) across the low-lying areas to the north, to approximately 200m AODN in the chalk uplands located to the south. The north of the area is relatively flat and comprises drainage marshland, with the exception of a small series of hills across the Hoo Peninsula. The River Medway cuts a valley through the chalk downs, with low-lying land levels adjacent to the River Medway and its associated tributaries.

2.1.2. Geology

Figure 2.2 shows the bedrock geology, which can be seen to follow the general topography of the area. Chalk dominates the southern half of Medway, whilst clay-like geology is typically found in the low-lying marsh area to the north.

Superficial soil deposits can be found across many of the hills and valleys throughout Medway, including the Chalk Downs, Luton Valley and elevated areas of the Hoo Peninsula. The lower lying areas of Medway, including areas adjacent to the River Medway mostly comprise superficial deposits of Alluvium or tidal flat deposits.

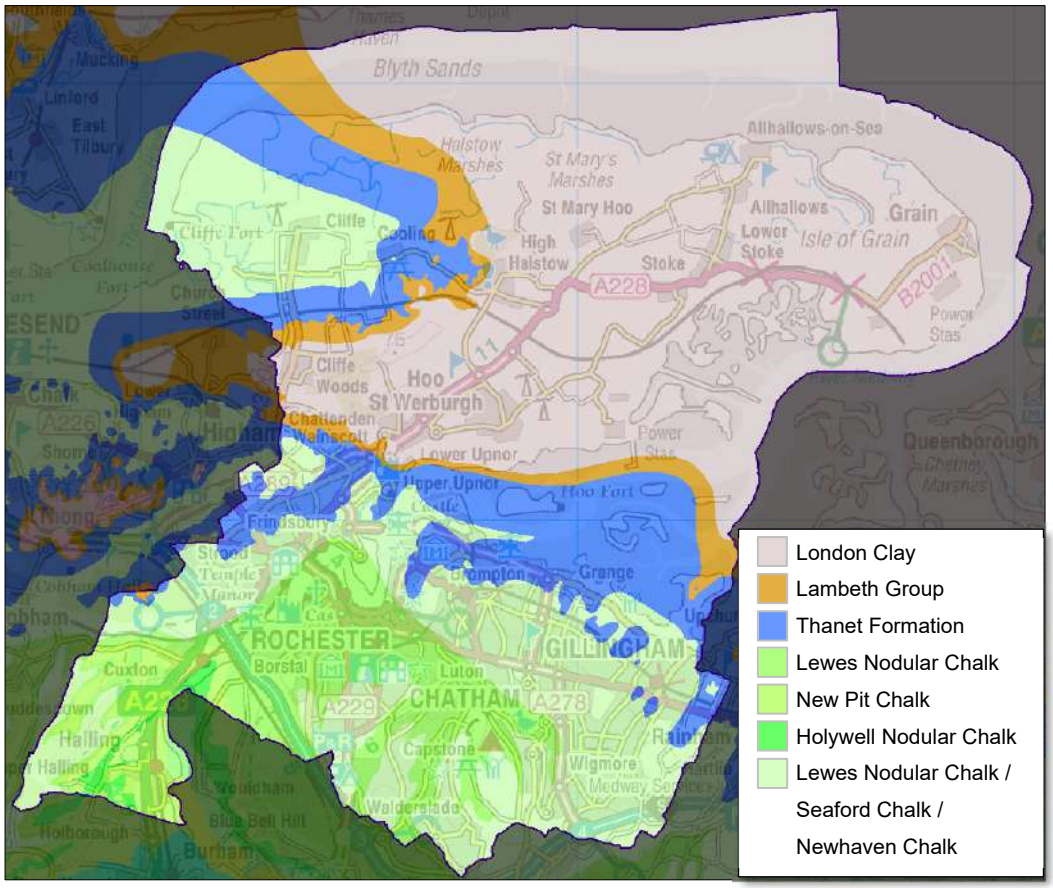


Figure 2.2 – Bedrock geology map of Medway (Contains British Geological Survey material © UKRI 2025), Mapping contains Ordnance Survey Data © Crown copyright and database right 2025.

2.2. Sources of Flooding

2.2.1. Flooding from Rivers and Watercourses

There are a number of rivers and watercourses throughout Medway and the location of these are shown on the map in Appendix A.2.

The River Medway is classified as a 'main river' and passes from Halling in the south, through the towns of Rochester, Strood and Upnor in the north whereby it forms the Medway Estuary. The tidal limit is located at Allington Lock (approximately 8km south of Medway). Through the urban centre of the Medway Towns, the River Medway is relatively confined within the river valley and from St Mary's Island onwards, the river widens into an estuary which encompasses the Hoo Salt Marsh, Nor Marshes and Stoke Saltings.

The northern side of the Hoo Peninsula is bordered by the River Thames, which is also tidally influenced. The tidal limit of the River Thames is located at Teddington Lock over 70km further upstream of the river mouth. The tidal influence of the River Medway and River Thames means that water levels will be governed by extreme sea levels within the estuary.

The north of Medway is dominated by marshland, which is drained by a network of man-made ditches, the primary function of which is to maintain lower water levels across the marshlands. The drainage ditches across the Cliffe Marshes, Cooling and Halstow Marshes, Allhallows Grain and Stoke Marshes all drain into the River Thames. Tide locking at the outlet of these watercourse may result in increased water levels within the network of ditches, which in turn could result in localised flooding of the lower-lying areas. The North Kent Marshes Internal Drainage Board (NKMIDB) are responsible for the management of these ditches.

2.2.2. Flooding from the Sea

There are two main ways that the sea can cause flooding; An extreme increase in the sea level, or through wave overtopping; These two mechanisms are discussed below.

- An extreme increase in water levels, known as a surge event, can occur when an already high tide coincides with a low-pressure weather event, resulting in the surface of the sea becoming elevated. Unlike the day-to-day tide, the height of a surge event is difficult to predict. Elevated sea levels due to a surge could result in flooding in coastal locations.

- A wave overtopping event usually occurs when large powerful waves collide with the shoreline, or sea defences, forcing seawater landwards. In this event the effects can be exacerbated by strong onshore winds, which contribute to increased runup and spray from the waves, allowing water to pass over the crest of the sea defences.

Development located directly behind the defences could be susceptible to flooding from wave overtopping or breach. This type of flooding is likely to occur when waves repeatedly strike the defence during a storm event resulting in overtopping or failure, and/or if the drainage system cannot cope with the sudden deluge of water. The results provided by the EA as part of their numerical flood modelling reveals that the Isle of Grain and parts of the Cliffe Marshes and Hoo Peninsula could be subject to flooding when waves overtop the defences. However, this is likely to be confined to the marshes and is unlikely to affect any larger settlements.

2.2.3. Flooding from Surface Water

The risk of flooding from surface water within the area is almost entirely governed by natural land levels. A series of small valleys has been identified within the town centres which direct surface water flows towards low points, where flood water has the potential to accumulate. This combined with large areas of impermeable surfacing, can contribute to increases in runoff rates and localised flooding as a result of this mechanism is known to have occurred in the past.

On the Hoo Peninsula, the majority of surface water is collected by the network of drainage ditches which dominate the landscape. Whilst the drainage ditches across the Peninsula act to drain the surrounding land, there are instances of historic flooding in this location, during which the capacity of these drainage ditches has been exceeded following an extreme rainfall event. Furthermore, the majority of the drainage network discharges into the River Thames and the River Medway, and therefore flooding has the potential to occur when high water levels in these rivers prevent the water discharging freely from the drainage network.

2.2.4. Flooding from Groundwater

Groundwater flooding typically occurs in areas with permeable underlying geology. The emergence of groundwater can occur in topographic low points, or where a groundwater spring has formed.

The Chalk Downs form a large principle aquifer and hold a large volume of groundwater. The migration of water through the chalk primarily occurs through fissures and fractures within the rock. Water held within the chalk is extracted via a number of mechanisms; human activity, wells and pumping stations, or is naturally drained to surface waters by springs. There is potential for groundwater flooding across the chalk downs, especially at the base of dry valleys, where large seasonal fluctuations in groundwater levels can reactivate springs or watercourses that are normally dry. The sometimes seasonal, or more often infrequent activation of springs, can in some cases make it particularly difficult to predict where groundwater emergence is likely to occur.

The influence of human activity (i.e. abstracting groundwater) may also need to be considered, especially as in recent years the reduction in groundwater extraction for industry has contributed to groundwater rebound. This is where water levels within aquifers return to a level which is higher than the natural levels.

Groundwater flooding is also possible in other areas of Medway, including the low lying flat land adjacent to the watercourses, such as the River Medway, or the Estuary. Groundwater emergence can also occur where barriers are introduced to natural groundwater flow or where subterranean structurers such as basements or tunnels are constructed below the water table. In these cases, care should be taken with respect to the design of underground structurers, to ensure the influence on groundwater does not result in an increased risk of flooding at the site or within the surrounding area. An assessment of groundwater flood risk is included within the Medway Local Flood Risk Management Strategy.

2.2.5. Flooding from Sewerage Infrastructure

Flooding from sewers can occur when the sewer is overwhelmed by heavy rainfall, becomes blocked, or is of inadequate capacity. Sewer networks are typically designed to accommodate the water generated under a storm with a 1 in 30 year return period and as such, higher return period rainfall events can cause sewers to surcharge. As a result, water may back up through pipework, flooding properties, or exit the sewer system via gullies and manholes.

Although typically confined to urban areas, sewer flooding is still possible within more rural locations where the sewer network is not so extensive and therefore, may have less capacity available. Common locations where sewer flooding can occur are where the gradient of sewer pipes become shallow. For example; upon reaching the base of valleys, near junctions between several sewers, and where large volumes of surface water runoff can easily enter the combined or foul sewer network. When a significant volume of water enters a combined or foul sewer, there is a risk that floodwater could become contaminated by foul effluent. The hazards attributed to untreated foul effluent can increase the risk associated with sewer flooding, although generally the effects are relatively localised.

Although sewers may be designated for draining surface water, foul water, or combined waste, it is recognised that misconnections can occur. This can result in a reduction in available capacity, increasing the likelihood of sewer flooding. The removal of unauthorised misconnections should therefore be a priority for minimising the risk of sewer flooding.

2.2.6. Flooding from Reservoirs

There are no potable water reservoirs within Medway, nor are there any artificial waterways such as canals. However, The EA's 'Risk of Flooding from Reservoirs' website does identify three reservoirs; the Bough Beech reservoir, Weird Wood reservoir and Bewl Water reservoir, all of which have the potential to flow into the River Medway during flood conditions. Although the risk of these privately owned and well maintained structures failing is low, these is still a minor risk of flooding from this source.

2.3. Historic Flooding

A review of the historic flood records for Medway has identified that there has been a number of minor flood events since the original SFRA addendum was published in 2011. These mainly comprise localised surface water and sewer flooding incidents within the more urban parts of Medway (i.e. the Medway Towns). More recent flooding from extreme rainfall occurred across urban areas in Medway in 2016 and 2018. Also, in September 2023, flash flooding occurred through surface water that affected areas in Chatham and Rainham. Nevertheless, Medway Council are working on schemes to reduce the impact in the future.

With regard to historic flooding from rivers or the sea, the last major flood event from the coast was recorded in 1953, during the storm surge which affected most of the North Kent coast. Since this date, tidal surges which resulted in minor flooding have been recorded in December 2005 and in 2013.

The historic records have been updated and are presented on the map in Appendix A.1. A list of the stakeholders which have contributed historical records of flooding as part of this SFRA are presented in Appendix A.8.

2.4. Design Flood Event

The magnitude of a flood event is expressed as its probability of occurrence. This can be defined as the average number of years expected before another event of the same magnitude will occur (termed the 'recurrence interval'). This is more commonly referred to as the return period and is expressed as the '1 in X year return period' event. Alternatively, events are defined as the probability that an event with a greater magnitude will occur in any one year, this is referred to as the Annual Exceedance Probability and is expressed as a percentage (i.e. X% AEP).

The NPPF requires that the risk of flooding is appraised for the 'design flood' event. For most sources of flooding this is defined as the 1 in 100 year return period or 1% AEP event. The exception is tidal flooding, where the design flood is based on the 1 in 200 year return period or 0.5% AEP event. In all circumstances, an allowance for climate change over the expected lifetime of the proposed development is also required to be considered.

The design event is used to appraise the suitability of a development and should inform the design of any mitigation measures.

2.5. Climate Change

The global climate is constantly changing, but it is widely recognised that we are now entering a period of accelerating change. Over the last few decades there have been numerous studies into the impact of potential changes in the future and there is now an increasing body of scientific evidence which supports the fact that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant global climate change during this century.

The nature of climate change at a regional level will vary: for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall of the type responsible for the recent UK flooding could be expected.

These effects will tend to increase the size of flood zones associated with rivers, and the amount of flooding experienced from other inland sources. The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels. It will also increase the extent of the area at risk should sea defences fail, although this increase will be comparatively small in the area due to the valley topography of the coastal floodplains. Changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events are also predicted.

To ensure that any recommended mitigation measures are sustainable and effective throughout the lifetime of the development, it is necessary to base the appraisal on the extreme flood level that is commensurate with the planning horizon for the proposed development. The NPPG states that residential development should be considered for a minimum of 100 years, but that the lifetime of a non-residential development depends on the characteristics of the development. For commercial development, a minimum 75 year design life is typically assumed, although the LPA and Environment Agency should be consulted to determine the most appropriate design life for each development.

2.5.1. Extreme Sea Level

Global sea levels will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west.

Since the previous SFRA, the Environment Agency has published new guidance on sea level rise allowances for climate change. Reference to guidance published by the EA specifies allowances for different regions across England. The predicted rates of relative sea level rise for the 'South East' region, relevant to Medway, are shown in Table 2.1. These values correspond with the Higher Central and Upper End percentiles (the 70th and 90th percentile respectively). The latest guidance provided by the Environment Agency recommends that the impact of both categories is appraised as part of a Flood Risk Assessment (Section 4.1).

Administrative Region	Allowance Category	Net Sea Level Rise (mm/yr) (Relative to 2000)			
		2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125
South east	Higher Central	5.7	8.7	11.6	13.1
	Upper end	6.9	11.3	15.8	18.2

Table 2.1 – Recommended contingency allowances for net sea level rise. Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

When these values are applied to the current day predicted extreme sea levels, it can be seen that the increase in sea level is significant and is not linear. The extreme water levels under a 1 in 200 year event have therefore been calculated for time steps between the current day and the year 2125 for both the 'Higher Central' and 'Upper End' scenarios. These values are summarised in Table 2.2 below for node point 4316, which is located north of Grain and provides an indicative profile of the predicted extreme sea level in this area.

Year	'Higher Central' scenario	'Upper End' scenario
Current day (year 2017)	4.65	4.65
2035	4.75	4.77
2065	5.01	5.11
2075	5.13	5.27
2095	5.36	5.59
2115	5.62	5.95
2125	5.75	6.13

Table 2.2 – Climate change impacts on extreme flood levels

2.5.2. Offshore Wind Speed and Extreme Wave Height

As a result of increased water depths resulting from changes in the climate, wave heights may change. The following allowances in Table 2.3 for offshore wind speed and wave height are applicable around the entire English coast and are relative to a 1990 baseline. These figures also include a sensitivity allowance, to show that the potential impact of climate change.

Parameter	2000 to 2055	2056 to 2125
Offshore wind speed allowance	+5%	+10%
Offshore wind speed sensitivity test	+10%	+10%
Extreme wave height allowance	+5%	+10%
Extreme wave height sensitivity test	+10%	+10%

Table 2.3 – Recommended climate change allowance and sensitivity ranges for offshore wind speed and extreme wave height (relative to 1990 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

2.5.3. Peak River Flow

Since the previous SFRA, the Environment Agency has published new guidance on the peak river flow allowances for climate change. The new figures show the anticipated changes to peak river flow by river basin district. Medway is covered by the Thames River Basin Districts, as defined by the Environment Agency River Basin maps. A copy of these maps can be found at;

https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

For each district a range of climate change allowances are provided for different time epochs over the next century, which correlate with the planning horizons for the varying classifications of development.

For each epoch there are three climate change allowances defined. These represent different levels of statistical confidence in the possible emissions scenarios on which they are calculated. The three levels of allowance are as follows:

- Central: based on the 50th percentile
- Higher Central: based on the 70th percentile
- Upper End: based on the 90th percentile

With reference to this methodology, it is recognised that although the higher percentile allowances are possible, these events are less likely to occur.

As well as encouraging sustainable development to meet the demands of a growing population, the NPPF also promotes a precautionary approach. For more vulnerable development in areas of higher risk of flooding, a higher percentile allowance is recommended in order to manage the risk of flooding over the lifetime of the proposed development. The Environment Agency has therefore provided guidance regarding the application of the climate change allowances and how they should be applied in the planning process, which can be seen in Table 2.4 below.

Flood Risk Vulnerability Classification	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Essential Infrastructure	↗	↗	↗
High Vulnerability	→	X	X
More Vulnerable	→	→	X
Less Vulnerable	→	→	X
Water Compatible Development	→	→	→

Key :

↑ Upper End

↗ Higher Central

→ Central

X Development should not be permitted

Table 2.4 – Recommended Climate Change allowance percentile based on flood risk vulnerability and flood zone compatibility. Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

The allowances for Medway cover the Thames River Basin District and are shown in Table 2.5 below.

Management Catchment (River Basin District)	Allowance Category	2015 to 2039	2040 to 2069	2070 to 2115
Medway (Thames)	Upper End	29%	37%	62%
	Higher Central	19%	21%	37%
	Central	14%	15%	27%

Table 2.5 – Recommended peak river flow allowances for each epoch for the Thames river basin district (1981 to 2000 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

2.5.4. Peak Rainfall Intensity

The recommended allowances for increase in peak rainfall intensity have also been updated (May 2022) since the completion of the previous SFRA. The allowances correspond to the Management Catchments as outlined in the section above and provide a range of values for both central and upper end percentiles (the 50th and 90th percentile respectively) over two-time epochs. In addition, allowances have been provided for a 3.3% annual exceedance rainfall event and a 1% annual exceedance rainfall event. The recommended allowances are shown in Table 2.6 below.

Management Catchment (River Basin District)	Allowance Category	3.3% annual exceedance rainfall event		1% annual exceedance rainfall event	
		2050s	2070s	2050s	2070s
Medway (Thames)	Upper End	35%	35%	45%	40%
	Central	20%	20%	20%	20%

Table 2.6 – Recommended peak rainfall intensity allowance for small and urban catchments (1981 to 2000 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

The allowances referenced above are applicable for site-scale applications (e.g. drainage design), surface water flood mapping in small catchments (<5km²) and urbanised drainage catchments. For large (>5km^2) rural catchments, the allowances for peak river flow (Table 2.5) should be used when assessing fluvial flood risk, as direct rainfall modelling is not considered appropriate for these catchments.

The EA guidance goes on to state that allowances should be assessed for both the 3.3% annual exceedance rainfall event and a 1% annual exceedance rainfall event. There is a requirement for development to be designed for the 1% annual exceedance rainfall event to ensure that:

- It will not result in an increase in flood risk elsewhere, and that
- It will be safe from surface water flooding.

Depending on the expected lifetime of the development, the EA requires different allowances to be considered, which are summarised in Table 2.7 below.

Development Lifetime – anticipated year		
Up to 2060	**2061 - 2100**	**Beyond 2100**
Use the Central allowance for the 2050s epoch	Use the Central allowance for the 2070s epoch	Use the Upper End allowance for the 2070s epoch

Table 2.7 – Recommended peak rainfall intensity allowance category based on development lifetime. Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

The EA recognised that there are some locations where the climate change allowance for the 2050s epoch is higher than for the 2070s epoch. If this is the case and the development lifetime exceeds the future year 2061, the higher of the two allowances should be used.

When designing Surface Water Drainage Systems, the EA advises that there should be no increase in the rate of runoff discharged from the site for the 'Upper End Allowance'.

All of the above recommended allowances for climate change should be used as a guideline and can be superseded if local evidence supports the use of other data or allowances. Additionally, in the instance where flood mitigation measures are not considered necessary at present but will be required in the future (as a result of changes in climate), a "managed adaptive approach" may be adopted where development is designed to allow the incorporation of appropriate mitigation measures in the future.

2.5.5. Impacts of Climate Change on Medway

Climate change will inevitably result in an increased risk of flooding from all sources. Consequently, the potential impacts of climatic change will require careful consideration before sites for development are allocated.

The Environment Agency's 'Flood Map for Planning' is based on current day sea levels and climate conditions. Nevertheless, the latest update released in March 2025 also provides the extent of flooding for rivers and sea taking into consideration the impact of climate change. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from Met Office, using the Representative Concentration Pathway (RCP) 8.5. The specific climate change scenarios shown are as follows:

- The 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers
- The 'Upper End' allowance for risk of flooding from the sea, accounting for cumulative sea level rise to 2125

Whilst these maps do consider the risk of flooding from rivers and the sea with defences and without defences, the maps only consider the current standard of protection and do no account for any potential improvements. The standard of protection is considered to reduce with time as extreme sea levels, and peak flows into the River Medway, increase into the future. To address the impact of climate change, it will be necessary to increase the crest level of the defences in line with these increases in water level in the future.

The consequences of such structures failing (i.e. a breach), or becoming overtopped, will therefore also increase in the future. When the dynamics of a breach are considered, the increase in sea level over the next 100 year period will result in a significant increase in the volume of water which is able to flow through the breach during the peak of an extreme event. Higher water levels can promote larger wave heights along the coastline, as waves are sustained closer inshore through a combination of increased water levels and increases in offshore wind speed.

In addition to the risk of tidal flooding, consideration should also be paid to the impact of climate change associated with pluvial flooding. Due to the topography and urbanised character, the town centres are prone to flashy responses during intense rainfall which has historically caused

problems. Consequently, an increase in peak rainfall intensity is also likely to significantly increase the risk of flooding from rivers.

By managing surface water in a sustainable manner, through the use of SuDS for example, it is possible to ensure that new development does not exacerbate flood risk on site, or elsewhere within the catchment. Taking climate change into account at the planning stage will ensure that its impacts are mitigated, thus the risk of flooding can be managed throughout the lifetime of the development.

2.6. Flood Defences

The location and extent of the existing defence infrastructure network within the area is shown in Appendix A.2. The mapping shows that that entire coastline benefits from defences, with the exception of Allhallows-on-Sea. The defences continue inland along the tidal watercourses, including the River Medway.

The Standard of Protection (SoP) varies significantly across Medway from a 1 in 20 year SoP to 1 in 1000 year SoP. The Medway Flood Defence Strategy undertaken in 2011 reveals that the majority of the existing defence infrastructure in the urban areas of Medway is below "the required standard based on present day flood levels". Defence condition also varies considerably throughout the area. When the impact of climate change is taken into account, the standard of protection will further reduce, and many areas which are currently protected have the potential to flood. This flooding is shown in the 2115 results of the EA numerical flood model for the North Kent Coast. As such, investment in flood defence infrastructure will become more important in the future.

Works have been undertaken to improve the standard of protection at a number of strategic sites within Medway, including Strood and Rochester; which include localised flood walls and significant land raising. Within Medway, the ownership or maintenance responsibilities for the flood defences vary; the majority of the defences are privately owned and maintained, with the remainder maintained by either Medway or the EA. Furthermore, the Medway Estuary and Swale Flood and Coastal Risk Management Strategy is currently being prepared, which will outline suitable schemes which are designed to protect people, property, agricultural land and designated habitat over the next 100 years.

2.7. Actual Risk and Residual Risk

The NPPF requires the **'actual risk'** of flooding to a development to be appraised. The actual risk considers the likelihood of flooding under extreme conditions (e.g. the design flood event), whilst considering the influence of any defence infrastructure, or drainage systems, which may provide a level of protection to the site.

The presence of such defences, or drainage system, does not necessarily imply a low risk of flooding, as locations where the design standard is low can still result in flooding under the design flood event.

Examples of actual risk are as follows;

- A combination of a storm surge and extreme waves resulting in waves overtopping the sea wall;
- The in-channel river level exceeding the crest height of the flood embankment which has a low standard of protection (e.g. 1 in 20 years);
- Surface water ponding in a topographic depression following a heavy rainfall event;
- Flooding from the emergence of groundwater due to a rising water table following prolonged rainfall;
- The capacity of the public sewer being exceeded, due to its low design standard (typically 1 in 30 years);
- Flooding within the highway due the highway gullies becoming overwhelmed, as these gullies are typically designed to manage the 1 in 2 year return period event.

The NPPF requires development to be appraised against the actual risk of flooding under design flood event conditions. However, from the above examples it is evident that many sites within Medway are reliant on the protection of flood defences, or are dependent on the influence of on-site drainage systems to ensure that the actual risk of flooding under the design event is reduced.

However, properties could be at risk of inundation by floodwater under the following conditions:

- If the defences were to fail (e.g. due to a breach).
- If the drainage system was to become overwhelmed, or blocked.
- The occurrence of an event greater than the design flood event (termed an exceedance event), causing water to overtop the defences.

The above risk is termed the **'residual risk'** of flooding.

Residual risk is a particular issue within the low-lying areas situated landward of the defences, along the River Medway and River Thames. When impacts of climate change are taken into consideration, the potential impact of residual risk is further exacerbated. Much of the marsh area located to the north of Medway is situated below the predicted extreme sea level in the future and unless the defences are upgraded in line with increasing water levels, the likelihood of the defences failing and the water level exceeding the crest height of the wall will increase into the future.

Given the rapid rate of inundation and extensive flooding which is likely to result from a residual risk flood event, the use of hydrodynamic numerical flood modelling is required to appraise the depth, extent and velocity of flooding under such scenarios. Such modelling has been undertaken by the EA for the Isle of Grain as part of the North Kent Coast Modelling Study.

The EA has also completed similar modelling for the reservoirs across England, to provide information on the expected depth and velocity of flooding in the event or a reservoir failure. The 'Flood Risk from Reservoirs' mapping identifies that there are no major reservoirs located within Medway, although floodwater from a failure of the Bough Beech Reservoir, Weird Wood Reservoir and Bewl Water Reservoir (located outside of Medway) would flow into the River Medway. The EA's 'Flood Risk for Reservoirs' mapping can be accessed at; https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

It is also necessary to consider the residual risk of flooding if the drainage system was to become surcharged. Flooding typically occurs during a pluvial event which exceeds the design criteria of sewer, or alternative as the result of a failure of the drainage system (i.e. due to a blockage). Consequently, these two scenarios should be considered when designing any new drainage systems. To minimise the risk of flooding to properties, it is recognised that the potential overland flow routes should also be considered to establish the area where floodwater is likely to pond following an exceedance event. This analysis will need to demonstrate that the proposed drainage system does not increase the risk of above ground flooding to the development, or to the surrounding area.

3. Policy Requirements

3.1. Applicable Policies and Studies

The purpose of this section is to highlight the important and applicable policies which inform the FRM process. This includes reference to both Local (e.g. Local Plan) and National planning policy (e.g. NPPF) relating to flood risk.

Flood and Water Management Act (FWMA) (2010)

In response to the Pitt Review which followed the summer 2007 floods, and the requirements of the EU Flood Directive, the Flood and Water Management Act was implemented in England and Wales in April 2010. The act outlines the responsibilities for managing flood risk and drought, with an increased focus on the risk of flooding from local sources. An important outcome of the act is that County or Unitary Authorities are now classified as *'Lead Local Flood Authorities'* and have the responsibility for managing flood risk at a local scale. Additionally, it aims to encourage the use of SuDS, and promotes resolution of sewer misconnections.

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) was published on 27th March 2012 and updated on 24th July 2018, 19th February 2019, 20th July 2021, 20th December 2023, and most recently 12th December 2024. This Framework is a key part of the Government's reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. The NPPF sets out the Government's planning policies for England and is used in the preparation of local plans, as well as in decision making with respect to planning. The framework is executed by means of the accompanying Planning Policy Guidance Suite (March 2014, August 2021, and August 2022) which supersedes PPS25: Development and Flood Risk Practice Guide (2009).

Paragraphs 7 to 223 contain policy that represents the Government's view of sustainable development. In order to achieve sustainable development within different districts, local circumstances need to be taken into account. Each Local Planning Authority is required to complete a SFRA to assess the risk of flooding from all sources, following criteria set out in the NPPF. The overarching use of SFRAs is to implement the Sequential Test, and where necessary the Exception Test, when determining land use allocation.

Non-Statutory Technical Standards for Sustainable Drainage Systems (NTSS)

As part of the Government's continuing commitment to protect people and property from flood risk, the Department for Environment, Food and Rural Affairs (Defra) consulted on a proposal to make better use of the planning system to secure sustainable drainage systems (2014).

National Standards for design, construction, maintenance and operation of SuDS came into effect from 6th April 2015 and relate to Schedule 3, Paragraph 5 of the Flood and Water Management Act 2010.

These Non-Statutory Technical Standards for SuDS provide additional detail and requirements not initially covered by the NPPF through specifying criteria to ensure sustainable drainage is included within applications classified as major development.

Kent County Council (KCC) Drainage and Planning Policy Statement (2019)

The Drainage and Planning Policy Statement outlines how KCC will review drainage submissions for all applications classified as 'major' development in accordance with the objectives of the Local Flood Risk Management Strategy, see paragraph below. The statement outlines the policy requirements for SuDS and other consideration which could impact the drainage design for a scheme.

Medway Council Local Flood Risk Management Strategy

Medway Council is the Lead Local Flood Authority (LLFA) and has the duty to manage local flooding, which covers the risk of flooding from surface water, groundwater and ordinary watercourses. In line with the Flood and Water Management Act, Medway Council produced a Local Flood Risk Management Strategy (LFRMS), which was published in 2014 and later updated in 2023. The strategy sets out to outline the approach to managing local flood risk within the area and how these could be implemented.

Medway Surface Water Management Plans (SWMP's):

Surface Water Management Plans have been undertaken in 2016 and 2020. The reports provide an assessment of the risk of surface water flooding in Medway by utilising hydraulic modelling, which has been undertaken as part of the reports. The results of the modelling have been used to recommend suitable surface water management strategies which could reduce the risk of flooding. The SWMPs include the urban areas within Medway in addition to the areas considered as part of the Local Plan consultation.

Medway Council Preliminary Flood Risk Assessment (PFRA)

In accordance with the Flood Risk Regulations 2009, Medway Council produced a PFRA in 2011 which was updated by the EA in 2017 The report identifies the risk of flooding across Medway from local sources (i.e. surface water, groundwater and ordinary watercourses), both historically and into the future. The study includes modelling of the risk of flooding from surface water.

Medway Flood Defence Strategy – High level appraisal of potential solutions to manage flood risk in urban Medway

A report produced in 2011 to determine the SoP and condition of existing flood defence structures, including an economic analysis to estimate the likely damage costs attributed to flood events on a flood cell basis.

North Kent Rivers Catchment Flood Management Plan (CFMP)

The North Kent Rivers CFMP, relevant to Medway, was completed and published by the Environment Agency in December 2009. A CFMP is a high-level strategic planning tool through which the EA seeks to work with other decision-makers within a river catchment to identify and agree policies for sustainable flood risk management. The primary objectives of the CFMP are to:

- Develop complementary policies for long-term (50-100 years) management of flood risk within the catchment that take into account the likely impacts of changes in climate, land use and land management.

- To undertake a strategic assessment of current and future flood risk from all sources within the catchment and quantify the risk in economic, social and environmental terms.

- Identify opportunities and constraints within the catchment for reducing flood risk through strategic changes and identify how these benefits could be delivered.

- Identify opportunities to maintain, restore or enhance the total stock of natural and historic assets from flooding.

- Identify the relative priorities for the catchment and assign responsibility to the Environment Agency and other operating authorities, local authorities, water companies and other key stakeholders for further investigations or actions to be taken to manage and reduce flood risk within the catchment.

Shoreline Management Plans

The Shoreline Management Plan is a large-scale assessment of the risk associated with coastal erosion and flooding, which seeks to set out high-level management options over three time epochs; 0 to 20 years, 20 to 50 years, and 50 to 100 years. The SMP is a non-statutory document used to inform the coastal planning and each management policy was derived taking into account social, environmental, technical and economic drivers over the next 100 years.

Whilst the SMP is not formally embedded within the planning system, it is used to inform the coastal change management area process outlined within Paragraph 183 to 186 of the NPPF.

Medway is covered by two SMPs which were adopted in 2008. The section of coastline from All Hallows on Sea to Grain falls within 'SMP10 Isle of Grain to South Foreland'. Inside the Medway Estuary, from the Isle of Grain, the coastline, and riverside, are covered by the 'SMP9 Medway Estuary and Swale'. These policies are still current and adopted. However, all SMPs within the UK are due to be subject to a light touch review referred to as the 'SMP Refresh Process'.

Information on Shoreline Management Plans and a copy of the Plans relevant to Medway can be accessed at; http://www.se-coastalgroup.org.uk/category/shoreline-management-plans/

Thames Estuary 2100 (TE2100)

The Thames Estuary 2100 Strategy sets out how to manage tidal flood risk up to 2100, and outlines short, medium and long-term actions required to address the increasing risk of flooding to communities along the Thames Estuary, as a result of climate change. Excluding the Medway Estuary, the Medway coastline is covered by the TE2100 Plan, and includes the embankments, revetments and seawalls designed to defend the Hoo Peninsula.

Medway Estuary and Swale Flood and Coastal Risk Management Strategy

The Medway Estuary and Swale Flood and Coastal Erosion Strategy (MEASS) was updated on 21st November 2024. This strategy determines the best approach to manage flood and coastal erosion risk, with the key focus on; economic, environmental and technical factors. The strategy looks to identify suitable schemes to deliver the policies set out within the Medway Estuary and Swale, and the Isle of Grain to South Foreland SMPs, with the ultimate objective of protecting people, property, agricultural land and designated habitat over the next 100 years. Updates on the Strategy can be found at;

https://www.gov.uk/government/publications/medway-estuary-and-swale-flood-and-coastal-risk-management-strategy/medway-estuary-and-swale-flood-and-coastal-risk-management-strategy

Local Plan

The current Local Plan was adopted in 2003 and is currently in the process of being updated. The updated plan is due to be adopted by the end of 2026 and will cover the period up until 2041. The Local Plan sets out policies for Medway in line with the Council's objectives for development. The SFRA forms part of the evidence base for the updated Plan, which will be used to update Local Planning Polices in relation to flood risk and surface water management, as well as informing the development allocation process.

The current Local Plan (2003) has two policies relevant to flood risk Policy BNE45 relates to development along the undeveloped section of the coastline with respect to the existing standard of protection provided by the defences. Policy CF13 outlines requirements for development in tidal flood risk areas.

3.2. Definition of Development Types

There are a number of development classifications which are referenced throughout this SFRA. Applications submitted to Medway Council will be classified as either householder, minor or major development depending on the scale of development. However, such development may also fall under a second definition relevant to the management of flood risk and surface water. The definitions of these development types are provided below for reference;

3.2.1. Householder Development

Householder development is applicable for planning applications for internal changes and extensions to existing dwellings.

3.2.2. Minor Development

The NPPG outlines a definition of minor development in relation to flood risk. This definition is used by the Environment Agency to define development which is subject to different guidance on the management of flood risk (refer to Flood Risk Standing Advice), and is used within the NPPF to identify developments which are not subject to the Sequential Test and Exception Test. The NPPG definition of minor development in relation to flood risk is not to be confused with the Council's definition of minor development. Minor development in relation to **flood risk** is defined as;

- *Minor non-residential extensions: industrial/commercial/leisure etc. extensions with a footprint less than 250 square metres.*
- *Alterations: development that does not increase the size of buildings e.g. alterations to external appearance.*
- *Householder development: For example; sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.*

3.2.3. *Non-major Development*

Non-major development is applicable for planning applications which are not classified as householder development, but are not large enough to be considered as major development.

3.2.4. *Major Development*

Major development is defined within the Town and Country Planning (Development Management Procedure) (England) Order 2010 as development involving one or more of the following;

> *a) the winning and working of minerals or the use of land for mineral-working deposits;*
>
> *b) waste development;*
>
> *c) the provision of dwelling houses where:*
>
> *(i) the number of dwelling houses to be provided is 10 or more; or*
>
> *(ii) the development is to be carried out on a site having an area of 0.5 hectares or*
>
> *(iii) more and it is not known whether the development falls within sub-paragraph (c)(i);*
>
> *d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or*
>
> *e) development carried out on a site having an area of 1 hectare or more.*

3.2.5. *Permitted Development*

The Town and Country Planning (General Permitted Development) Order 1995 was amended in May 2013 to allow householders to undertake a wide scope of enlargements, improvements, and other alterations to their properties. This allowed for greater flexibility under permitted development for the change of use of commercial premises, without the need for a full planning permission. In April 2016, the Order was revised to incorporate the change of use of other use classifications to residential use; including (but not limited to) laundrettes and light industrial use buildings. Further amendments to the categories of use change which are permitted have been made on an annual basis. An up-to-date summary of the class use changes which are allowed under *permitted development rights* can be found at:

https://www.planningportal.co.uk/info/200130/common_projects/9/change_of_use/2

3.2.6. ***'Small-scale' Development'***

This SFRA outlines the requirements for managing surface water runoff from new development which applies to all development with the exception of 'small development'. This classification is not directly related to the type of planning application submitted but instead determines whether the Surface Water Management Proforma is required to be submitted alongside the planning application. Small-scale development comprises the following:

- Minor non-residential extensions: industrial/commercial/leisure, extensions etc. with a footprint less than 25m².
- Householder development: e.g. sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself, that have a footprint less than 30m².
- Change of use/alterations to an existing development: development that does not increase the size of buildings (e.g. alterations to external appearance). This includes any development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

3.3. Requirements for a Flood Risk Assessment

The NPPF (2024) requires a site-specific FRA to be submitted for **all development located within Flood Zones 2 and 3**. In addition, development situated within **Flood Zone 1** will also require an FRA if the application meets one or more of the following criteria;

- The development site (red line boundary) is **greater than 1 hectare.**
- The 'Flood Map for Planning' shows it is at increased risk of flooding from rivers or sea during its lifetime
- The 'Flood Map for Planning' shows it is at risk of flooding from surface water
- The development site is located within an area known to have **critical drainage problems***.
- The development site is located within an area identified by the SFRA as being at increased flood risk in the future.
- The development site introduces more vulnerable uses in an area shown to be at risk of flooding from other sources.

(*) It is recognised that there are no areas designated by the EA as Critical Drainage Areas within Medway. Nevertheless, the LLFA may request that an FRA is submitted in support of an application,

for example, for sites where localised issues relating to flooding are identified (for example sites within Sensitive Drainage Areas, identified in Section 5.3.2).

For some minor development and change of use, the NPPF states that the above criteria for preparing a site-specific flood risk assessment still apply. However, such applications are not subject to the Sequential Test or Exception Test.

A site-specific FRA is also required to be submitted in support of applications for **a change of use** where the proposals are subject to **permitted development rights.** Such applications are subject to a notification procedure with the LPA, referred to as a prior approval application (PAA). The applicant is required to submit details of the proposals, site details and any other information deemed necessary for the LPA to assess the potential impact with regard to: transport and highway; contamination; flood risk; and noise impact. The FRA should demonstrate how the risk of flooding will be managed to ensure that the development remains safe through its lifetime.

To determine which Flood Zone the development site is located, the EA's 'Flood Maps for Planning' should be referenced:

https://flood-map-for-planning.service.gov.uk/

4. Flood Risk Management

4.1. What should an FRA include?

This section provides guidance on managing flood risk for developments which are required to submit a Flood Risk Assessment (see *"Requirements for a Flood Risk Assessment')*

A site-specific FRA should be prepared in accordance with the requirements set out in Paragraphs 20 - 22 and 54 of the *Planning Practice Guidance: Flood Risk and Coastal Change*. A checklist of the elements to be included within a site-specific FRA can be found at the following web address:

https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section

The FRA must be appropriate to the scale, nature and location of the development and consider all possible sources of flood risk including the effects of flood risk management infrastructure and the vulnerability of those that could occupy and use the proposed development.

The following sections of this report provide guidance on the various sections required within an FRA: application of the Sequential and Exception Test, designing to manage flood risk, and the management of surface water runoff from a development. To assist in navigation through the report, the relevant sections which are applicable for each classification of development are presented in Table 4.1 below.

	Permitted Development (Change of Use)	Householder	Minor	**Non-major**	**Major**
Sequential Test required?	*Not Required*		*Yes for sites in Flood Zone 2 and/or 3 only, or for sites at risk of flooding from other sources, now or in the future.*		
Exception Test	*Not Required*		*Yes , dependant on vulnerability and Flood Zone classification.*		
Analysis and management of Flood Risk	*Yes - for all sites which require an FRA to be submitted*				
Management of Surface Water Runoff	*Refer to Section 5.1 'Requirements for Surface Water Runoff'*				

Table 4.1 – Quick reference for the appropriate section for each classification of development.

4.2. Sequential Test

LPAs are encouraged to take a risk-based approach to proposals for development in areas at risk of flooding through the application of the Sequential Test. The objectives of this test are to steer new development away from high risk areas, towards those at lower risk of flooding. The Sequential Test therefore requires the applicant to demonstrate that the development cannot be located in an area at lower risk of flooding by searching for alternative opportunities. In some areas, where developable land is in short supply, it may be demonstrated that there are no alternative sites at lower risk of flooding, and that there is overriding need to build in areas that are at risk of flooding.

The following developments are **exempt** from the Sequential Test;

- Development classified as 'minor development' in relation to flood risk.
- A change of use application where by the lawful planning use is changed. For example, Part 3, Class M: changing a Class A1 (shops) to Class C3 (dwelling houses). The exception is for applications for a change of use to a caravan, camping or chalet site, or to a mobile home or park site.

In addition, Paragraph 175 of the NPPF (2024) also states;

"The sequential test should be used in areas known to be at risk now or int the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potential vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk)."

Consequently, a site is exempt from the Sequential Test if a site-specific flood risk assessment is in alignment with the above.

Based on the above criteria, development sites which are determined to be subject to the Sequential Test will be required to submit supporting information to the LPA to accompany the planning application.

The NPPF specifies that '*a Sequential risk-based approach should also be taken to individual applications in areas known to be at risk now or in the future from any form of flooding'*. Although the NPPG states that the Sequential Test is applicable for sites located within Flood Zones 2 and 3, paragraph 023 of the NPPG states that '*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'.* In consideration of this, Flood Zones have been used in conjunction with the EA's 'Flood Risk from Surface Water' and 'Flood Risk from Reservoirs' mapping to produce a combined 'Potential Risk of Flooding' map provided in Appendix A.4.

The potential risk of flooding map does not indicate areas which are at risk of flooding from other sources such as sewers, groundwater or ordinary watercourses, although the Local Flood Risk Management Strategy does provide some indicative groundwater flood risk mapping, and Surface Water Management Plans appraise the risk of surface water flooding including detailed surface water sewer flooding. However, the 'Potential Risk of Flooding' map can be used in the first instance to identify sites which are potentially at risk of sources of flooding and therefore, are required to apply the Sequential Test.

Guidance on the application of the Sequential Test has been produced by Medway Council and is available on the Council's website. This guidance has been applied as part of the site allocation process in support of the emerging Local Plan.

4.3. Exception Test

If following the application of the Sequential Test it is not possible, or consistent with wider sustainability objectives, for the development to be located in an area at lower risk of flooding, the Exception Test can be applied.

As part of this process, it is necessary to consider the type and nature of the development. Table 2 of the *Planning Practice Guidance: Flood Risk and Coastal Change* (Paragraph 079) defines the type and nature of different development classifications in the context of their flood risk vulnerability. This has been summarised in Table 4.2 below, which highlights the combinations of vulnerability and flood zone compatibility that require the Exception Test to be applied.

Flood Risk Vulnerability Classification	Zone 1	Zone 2	Zone 3a	Zone 3b
Essential infrastructure – Essential transport infrastructure, strategic utility infrastructure, including electricity generating power stations	✓	✓	e	e
High vulnerability – Emergency services, basement dwellings, caravans and mobile homes intended for permanent residential use	✓	e	×	×
More vulnerable – Hospitals, residential care homes, buildings used for dwelling houses, halls of residence, pubs, hotels, non-residential uses for health services, nurseries and education	✓	✓	e	×
Less vulnerable – Shops, offices, restaurants, general industry, agriculture, sewerage treatment plants	✓	✓	✓	×
Water compatible development – Flood control infrastructure, sewerage infrastructure, docks, marinas, ship building, water-based recreation etc.	✓	✓	✓	✓

Key:

✓ Development is appropriate
× Development should not be permitted
e Exception Test required

Table 4.2 - Flood risk vulnerability and flood zone compatibility

As with the Sequential Test, applications for 'change of use' or 'minor development' (in relation to flood risk) are exempt from the Exception Test.

Flood Zone 3 as shown by the EA's Flood Maps for Planning is further sub-divided into Zone 3a and 3b (referred to as the *functional floodplain*). Clarification between Flood Zone 3a and 3b is an important distinction that needs to be made when determining when the Exception Test is applicable. Table 4.2 identifies that no development, other than essential transport and utilities infrastructure, will be permitted within the functional floodplain.

To determine whether a development is located within the functional floodplain, it will be necessary to consult the EA to obtain additional information on the likelihood of flooding at the application site. Based on this information (where available) the following Test should be applied;

- *Do predicted flood levels show that the site will be affected by an event with a return period of 1 in 30 years or less?*

- *Is the site defended by flood defence infrastructure that prevents flooding under events with a return period of 1 in 30 years or greater?*
- *Does the site provide a flood storage or floodwater conveyance function?*
- *Does the site contain areas that are 'intended' to provide transmission and storage of water from other sources?*

The NPPG states that '*the identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters'*. The functional floodplain has been defined using the area of land which naturally flood during a 1 in 30 year return period event or greater in any year (3.3% AEP) taken from the EA's North Kent Coast modelling study and the EA's River Medway modelling study.

Sites which are identified within Table 4.2 to be subject to the Exception Test cannot be permitted or allocated until the Exception Test is passed. There are two criteria which make up the Exception Test, both of which must be satisfied;

Part A: It should be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk

The sustainability benefits of the development can be appraised against the objectives outlined within the Medway Council's sustainability appraisal, which will be undertaken as part of the evidence base for the emerging Local Plan.

Part B: 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.

The following section outlines guidance on the preparation of a flood risk assessment, including how to consider appropriate mitigation measures which will help to meet the second criterion of the Exception Test.

Development sites which have been allocated as part of the emerging Local Plan will still be required to meet the objectives of the Exception Test before permission can be granted.

4.4. Designing for Flood Risk

In accordance with the requirement of the NPPF outlined above, all development located in an area identified to be at risk of flooding is required to consider options for mitigating the risk of flooding. This is to ensure that occupants/users of the development will be safe throughout its anticipated lifetime. Mitigation measures should be designed up to an including the design flood event and should remain effective even when an allowance for climate change is considered. For development that is subject to the Exception Test, the use of appropriate mitigation measures will be necessary to ensure that the second criterion is met.

The NPPG outlines an updated hierarchy for flood risk management, which is shown in the flow chart below in order of preference.

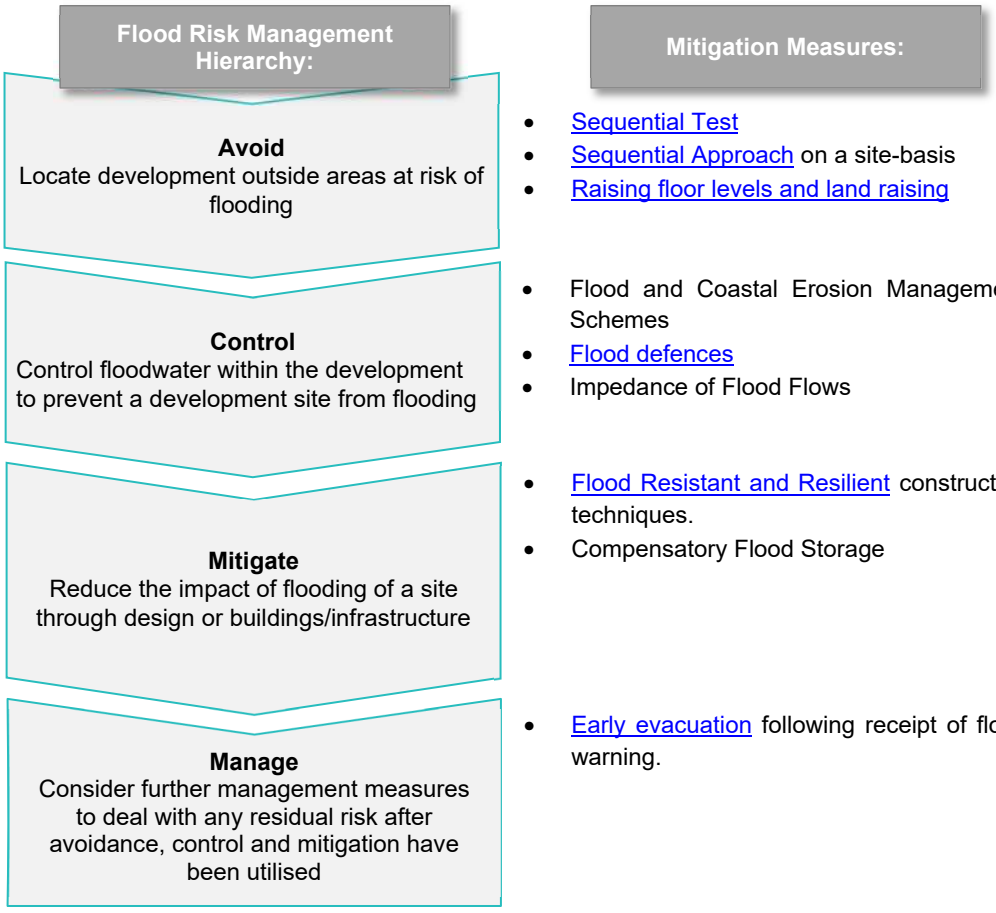


Figure 4.1 – Flood Risk Management hierarchy with associated methods of flood mitigation.

Following the hierarchy outlined in Figure 4.1, the following sections provides an overview of each mitigation measures and identifies any key points for consideration when designing a scheme.

4.4.1. Flood Risk Standing Advice

The EA's Flood Risk Standing Advice applies to the following development types;

- *a minor extension (household extensions or non-domestic extensions less than 250 square metres) located within flood zone 2 or 3.*
- *'more vulnerable' development located within flood zone 2 (except for landfill or waste facility sites, caravan or camping sites).*
- *'less vulnerable' development locate within flood zone 2 (except for waste treatment sites, mineral processing sites, water and sewage treatment plants).*
- *'water compatible' development located within flood zone 2.*

Details of the requirements outlined under the EA's Flood Risk Standing Advice can be found at; https://www.gov.uk/guidance/flood-risk-assessment-standing-advice

For all other types of development, the mitigation measures described in the following sections should be followed.

4.4.2. Sequential Approach

Following application of the Sequential Test, the ***sequential approach*** should be applied to locating and designing development on a site-based scale. For example, more vulnerable elements of the scheme should be located where the risk of flooding is lowest (e.g. on the higher parts of the site). The higher risk areas of the site (e.g. lower-lying parts of the site) should only be allocated for less vulnerable elements (e.g. parking, recreational land or even commercial buildings).

The Sequential Approach should also be applied within the design of the internal layout of the building. This would mean that more vulnerable elements such as sleeping accommodation should preferably be located above the less vulnerable elements (e.g. parking, offices, living accommodation on lower floors).

4.4.3. Flood Defences

Flood defences can be used to prevent floodwater from reaching a development site. Defences can be constructed on a strategic scale, as part of a flood defence scheme facilitated by the EA. Alternatively, defences can be used at a site-scale, such as the construction of an earth bund designed to manage overland flows through a development. Temporary defences may also be used to provide protection to a development in anticipation of an extreme flood event.

However, it should be recognised that flood defences will only provide protection up to the design standard of the protection, and as such, the development could still be subject to the *residual risk* of flooding (e.g. if the defences were to fail). The ongoing maintenance of any formal structures which are constructed will also need to be considered as part of the design of a flood defence, to ensure that the structure continues to function as designed.

Furthermore, the loss of flood storage from the area which is being protected may need to be offset to ensure that the risk is not increased elsewhere by directing floodwater into the surrounding flood compartment.

4.4.4. Land Raising and Raising Finished Floor Levels

If it is not possible to avoid floodwater reaching the development site, the finished floor levels should be raised to reduce the risk to the occupants/users of the site.

For sites at risk of tidal or river flooding, the EA typically requires the finished floor levels for all new development to be raised 300mm above the design flood level for living accommodation and 600mm above the design flood level for sleeping accommodation. In order to achieve the required levels, it may be possible to use a combination of the following techniques;

- Raising the internal ground floor level to the required level. Where floor levels are raised substantially above the existing ground level, consideration should be made for access to/from the building, particularly where disabled access is required.

- The use of townhouse-style development, comprising parking or other non-habitable uses on the ground floor. When proposing a sacrificial ground floor, the requirements for access/egress to/from the development should be considered. Furthermore, the addition of a sacrificial floor can have an impact on other planning requirements (i.e. ridge height limitations).

- Raising land levels to create a development platform above the design flood level. When land raising, consideration needs to be given to the potential for the displacement of floodwater.

It is recognised that there may be circumstances where the requirements outlined above are not achievable within the constraints of the development. For example, where ridge height limitations, or the existing fabric of the building limit the height to which the internal floor level can be raised. In such circumstances, clarification with regard to the requirements for finished floor levels should be sought on a site-by-site basis. It is recommended that the EA/LLFA are consulted through their pre-application advice service at the earliest opportunity.

4.4.5. Resistance and Resilience

For development located within a flood risk area, buildings should be designed appropriately to limit the potential impact of a flood event, and to minimise the cost and time of recovery following a flood event. The document '*Improving the Flood Performance of new buildings*' provides guidance on common building material and construction methods which could be considered to reduce the impact of flooding to a building. This document can be found at;

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7730/flood_performance.pdf

For flood depths up to 0.3m, the preferred approach is to minimise floodwater ingress whilst maintaining structural integrity. This is achieved through the use of flood resistance measures. Typical examples include the use of low permeability building materials (e.g. engineering bricks, solid-concrete floors), or temporary measures such as covers for doors and airbricks. The use of permanent (termed *passive)* flood resistance measures is preferable over temporary (termed *active)* measures, as they do not require action by owners/users of the site during times of flooding.

Most flood resistance products are only effective to a flood depth up to 0.6m. Therefore, for flood depths equal to, or less than 0.6m, flood resistance measures should be used in an effort to limit the potential for the ingress of floodwater into the building. Notwithstanding this, in circumstances where the ingress of floodwater into a building is possible, the building should be designed to limit the impact that a flood event could have. This is focussed on the time and cost of recovering from such an event. Flood resilience measures can include, but are not limited to: raising appliances;

boilers and other electrical fittings above the flood level; using materials such as tiles and waterproof plasterboard.

As flood depths exceed 0.6m, the design standard of most resistance measures is likely to be exceeded, resulting in internal flooding of the building. In such circumstance, flood resistance is still recommended in order to delay the ingress of water (i.e. as water levels rise outside the building). However, the emphasis is placed on using flood **resilient** design.

For minor development (in relation to flood risk) and change of use applications, the EA's Flood Risk Standing Advice recommends floor levels are set at least 600mm above the estimated flood level, with the use of flood resistant materials up to at least 600mm above the estimated flood level. It is possible to reduce this to 300mm if there is a high level of certainty about the estimated flood level. If there is a particularly high level of uncertainty it may need to be increased. If the development cannot raise the floor levels in this way, then extra flood resistance and resilience measures will need to be included. These measures should protect the property to at least 600mm above the estimated flood level.

Where internal changes to an existing building are proposed (i.e. change of use), it is unlikely that flood resistant and resilient construction techniques can be implemented successfully. However, there are an increasing number of products available which can be retrofitted into existing buildings. These are referred to as Property Level Protection (PLP) measures and the following British Standards:

- British Standard 851188-1:2019+A1:2021
- British Standard 85500:2015
- British Standard 8102:2022

To install PLP measures requires a survey of the flood performance of the existing building to identify potential locations where floodwater could ingress. Information on PLP measures, and details of appropriately qualified PLP surveyors can be found at the Blue Pages, hosted on the National Flood Forum website:

http://bluepages.org.uk/

4.4.6. *Compensatory Flood Storage*

In circumstances where a building displaces floodwater, the volume of water displaced may need to be compensated for by providing a compensatory flood storage scheme. This is to ensure that the risk of flooding is not increased elsewhere.

For extensive tidal flooding along the coastline compensatory flood storage is *not* typical required as Paragraph 049 of the NPPG states *"The loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is solely tidal",* However, the NPPG also states *"Where it is not possible to fully mitigate the impacts of development on flood risk elsewhere, now and in the future, the site-specific flood risk assessment will need to fully detail the extent and nature of the increase in risk and to assess its significance".* Therefore, where the floodplain is considered to be confined, irrespective of the source (i.e., fluvial or tidal), the impact of displacing floodwater is likely to have a greater impact on the flood levels in the surrounding floodplain. Numerical flood modelling can be used to determine the likely impact and extent which compensatory floodplain storage will be necessary.

Where it is identified that compensatory floodplain storage is required to ensure that the development does not increase the risk of flooding offsite, the EA requires the 'Upper End' allowance for peak river flow (refer to 'climate change') to be used to calculate compensatory flood storage in the following circumstances;

- When the catchment is particularly sensitive to small changes in volume, causing significant increases in flood depth or hazard.
- The affected area contains essential infrastructure or vulnerable uses such as primary schools, caravans, bungalows or basement dwellings.

The 'Central' allowance for peak river flow may be used to calculate compensatory flood storage if evidence is submitted to the EA to demonstrate that the affected area contains only low vulnerability uses such as water compatible development, taking into consideration future land uses based on allocated sites in the local plan and submitted planning applications.

The measures below have been listed in order of preference and should be followed when displacement from a fluvial source is evident:

- All the buildings should be located outside the predicted flood extent on site, in accordance with the Sequential Approach.
- If the buildings cannot be located outside the flood extent, compensatory floodplain storage should be provided onsite and on a level-for-level, volume-for-volume basis. An equal volume of water displaced by the development is to be provided and should be located outside of the flood extent. Floodplain storage can be provided as either a 'block' which matches the development, (i.e. covering a similar area), or alternatively floodplain storage may be distributed across the site at convenient locations (within the same flood

compartment),as long as any compensation area is hydraulically linked to the floodplain. However, an equal volume must apply at all levels between the lowest point on site and the design flood level to ensure that there is no adverse impact offsite.

It is recognised that there are circumstances where it may not be possible to provide compensatory flood storage. In these cases, it may be acceptable to provide flood storage offsite, provided the area proposed for flood storage is hydraulically and hydrologically linked to the wider flood compartment.

Paragraph 049 of the NPPG discourages the use of stilts and voids for compensation due to not allowing *"water to freely flow through them, trash screens get blocked, voids get silted up, they have limited capacity, and it is difficult to stop them being used for storing belongings or other materials"*. However, for sites which have demonstrated that there are no other reasonable locations for the development to be located (i.e. through the application of the Sequential Test), and it has been demonstrated that it is not possible to provide compensatory storage using the methods outlined above, then the EA/LLFA should be consulted to discuss the use of undercroft void space (otherwise referred to as 'stilts'). Through the use of undercroft voids, the ground floor level can be raised above the predicted flood level to allow the storage of floodwater beneath the building.

If voids are specified, they will typically be required to be 1m in width and there should be a minimum of one void for each 5m length of wall. The underside of the floor (top of the void) should be situated a minimum of 300mm above the design flood level. The voids should be designed to allow water to flow unimpeded beneath the building and the use of anti-vandalism, or anti-vermin mesh can be considered, providing there is a maintenance schedule in place to ensure that any mesh is cleared of obstructions on a regular basis.

It may be possible to incorporate a sacrificial ground floor within the scheme design (i.e. the use of undercroft parking) which is designed to enable floodwater to be stored beneath the building during an extreme flood event.

If it is not possible to mitigate the impacts of development in full through the provision of flood storage, it will be necessary to demonstrate the increase in risk of flooding to the site and surrounding area and assess its significance.

4.4.7. Impedance of Flood Flows

All development should be designed to ensure any identified flow paths are not obstructed as part of the development proposals. The preferred mitigation would be to locate all development outside of the overland flow path. Green-blue infrastructure corridors should be incorporated into the scheme design to accommodate any overland flow routes through the development site and be incorporated into the open space provision where feasible. For large sites, it may be necessary to quantify the extent, depth and velocity of flood flows including an allowance for climate change into the future to enable suitable design of any green features (e.g. swales etc.). The CIRIA SuDS Manual provides advice on designing to accommodate overland flows.

4.4.8. Proximity to Watercourses

There are several bodies responsible for rivers and ordinary watercourses according to the Water Resources Act 1991 and Land Drainage Act 1991.

- The LLFA are responsible for the regulation of ordinary watercourses.
- The Internal Drainage Board (IDB) is responsible for the regulation of watercourses located within defined 'internal drainage districts'. Within Medway there are two IDBs; the Lower Medway IDB, and the North Kent Marshes IDB. A map showing the areas covered by each IDB is included in Appendix A.3.
- The EA is responsible for watercourses which are designated as 'main rivers'. To determine whether the development site is in proximity to a main river, refer to the following website;

  https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

4.4.9. Maintenance and Biodiversity Easements

For main rivers, the EA require that an 8m buffer zone is retained between the river bank and any permanent construction such as buildings, or car parking etc. This buffer zone increases to 16m for tidal waterbodies and sea defence infrastructure. This buffer is required to allow access for maintenance and to promote biodiversity along the river corridor.

For development sites located in proximity to an ordinary or IDB maintained watercourse, it is recommended that the responsible body is contacted to confirm the access and maintenance requirements.

4.4.10. Permitting and Consent

In addition to the above, it may be necessary to obtain an Environmental Permits or Flood Risk Activity Permit (FRAP) from the EA for works undertaken;

- on or near a main river
- on or near a flood defence structure
- in a floodplain
- on or near a sea defence

Information on which activities are subject to a Flood Risk Activity Permit can be found at; https://www.gov.uk/guidance/flood-risk-activities-environmental-permits.

For works on ordinary, or IDB maintained watercourses, a Flood Risk Activity Permit is not required. However, the Land Drainage Act requires that formal written consent is sought from the relevant

body for **any works adjacent to, or within a watercourse, that could affect in-channel flows** and is located within the buffer zone as defined by each responsible body. This includes any proposals for culverting a watercourse.

4.4.11. ***Safe Access Routes***

The NPPG requires that new development is designed to ensure safe access/egress to/from the development is available under design event conditions. In addition, evacuation will need to be achievable for sites under the 1 in 1000 year flood event, including an appropriate allowance for climate change. This should include provision for the emergency services vehicles to safely reach the development.

To determine whether access/egress to/from a development is considered to be *safe*, the flood hazard should be quantified. The methodology for calculating flood hazard is outlined in the report 'Flood Risks to People' (R&D output FD2320/TR2) and is based on the expected depth and velocity of flooding along the anticipated access route. The flood hazard is classified into categories which show the degree of hazard;

Hazard Rating (HR)	Degree of flood hazard	Description
< 0.75	Low	Caution – shallow flowing water or deep standing water
0.75 to 1.25	Moderate	Dangerous for some, i.e. children – deep or fast flowing water
1.25 to 2.5	Significant	Dangerous for most people – deep fast flowing water
> 2.5	Extreme	Dangerous for all – extreme danger with deep and fast flowing water

Table 4.3 - Classification of Hazard Rating Thresholds.

For sites located within an area at risk of flooding, a Flood Warning and Evacuation Plan (FEP) may be requested by the EA. Paragraph 043 of the NPPG also requires that a Flood Warning and Evacuation Plan (FEP) is prepared for *'sites at risk of flooding used for holiday or short-let caravans and camping and for any site with transient occupancy (e.g. hostels and hotels)'*.

A FEP should provide information to owners/residents of a development on procedures to be followed on receipt of a flood alert, flood warning, or severe flood warning. This should include emergency contact numbers and a flood action plan explaining measures that residents/users of the development can take to lessen the impact of such an event (e.g. moving belongings upstairs, installing PLP measures). Other site-specific information, such as emergency access routes through the site to an area that is located above the predicted flood level (which can be used as a safe haven until floodwater recede), should be detailed within the FEP.

To inform early warning and evacuation, the EA operates a flood warning service in areas at risk of flooding from rivers or the sea. This service is based on different measurements of rainfall, river

levels and tide levels and utilises in-house predictive models, rainfall radar data and information from the Met Office. This service operates 24 hours a day, 365 days a year.

Occupants/owners of developments which are located in an area identified to be at risk of flooding should sign up to the EA's Flood Warning Service;

https://www.gov.uk/sign-up-for-flood-warnings

Further advice can be sought from the Council's document 'Guidance for Emergency Planning' which can be accessed at;

https://www.medway.gov.uk/floodrisk

5. Management of Surface Water Runoff

The following section of this report outlines the level of assessment required to be submitted as part of a planning application and provides guidance on how the risk from surface water should be appraised and managed.

New development has the potential to increase the rate of runoff from the site due to an increase in the impermeable area of the site. This acts to increase both the rate and volume of runoff from a site. In turn, this can increase the risk of flooding to the surrounding area, reduces the replenishment of groundwaters via infiltration, and encourages erosion and pollution of watercourses through increased flow rates and sediment entrainment. It is therefore necessary to manage the runoff from development in a sustainable manner though the use of SuDS.

SuDS can contribute towards many planning objectives and improve places and spaces within local communities. The use of SuDS provides a natural approach to the management of surface water taking into consideration water quantity (flooding), water quality (pollution), biodiversity (wildlife and plants) and amenity. Recognising the requirements of NPPF, the use of SuDS within developments should provide multi-functional benefits by working holistically within the context of landscape, urban design, and open space requirement via a SuDS Management Train as appropriate.

5.1. Requirements for a Surface Water Management Strategy

The requirement for either a Surface Water Management Strategy and/or SuDS Proforma, and the level of detail which is required to be submitted is dependent on the scale of the development, as outlined at Table 5.1.

A Surface Water Management Strategy can be a standalone document, or form part of a Flood Risk Assessment where one is required. A Surface Water Management Strategy sets out how local flood risk (flooding from sewers, drains, groundwater, ordinary watercourses, heavy rainfall) can be managed for the lifetime of the development, using the guidance included within this SFRA at Sections 4 and 5.

Within the Medway area, it is recognised that there are areas which are not perceived to be at direct risk of flooding from surface water, but may be hydraulically linked to areas which are at high risk of flooding from surface water. Consequently, to limit the increased risk of flooding posed by new development within these high risk areas, parts of the district may be subject to additional restrictions.

Using data from the Medway Preliminary Flood Risk Assessment (PFRA), Surface Water Management Plan (SWMP) catchment areas, historic flood incident mapping for Medway, as well as geological and topographical maps, a number of 'Sensitive Drainage Areas' have been identified. A map of the 'Sensitive Drainage Areas' (SDAs) is included within Appendix A.7.

If a development site is shown to be located within a SDA, this should be recorded on the SuDS proforma in the relevant section (where applicable).

The Sustainable Drainage (SuDS) Proforma can be found within Appendix A.6 of this report, and guidance on how to complete the proforma is provided in the following sections.

Not Application Type	Requirement
Permitted development	The NPPF encourages the use of SuDS for all development, however, there are no local policy requirements to provide additional supporting documentation in relation to SuDS at this time. Notwithstanding this, all development will be subject to The Building Regulations requirements for drainage and waste disposal (Part H).
Householder application within definition of 'small development'	
Householder (except 'small development')	In accordance with national planning policy, all development should use SuDS where possible to ensure that the risk of flooding off-site is not increased as a result of surface water runoff. For development identified to be located within a 'Sensitive Drainage Area', Medway Council ***may recommend*** that a SWMS or Sustainable Drainage (SuDS) Proforma is submitted. Please contact suds@medway.gov.uk for more information.
Minor	
Major	Major development is required to demonstrate compliance with the Non-Statutory Technical Standards for SuDS, as well as all local planning policies related to drainage. Medway Council therefore ***require*** all developers to submit a detailed Surface Water Management Strategy (SWMS). In addition, the SuDS Proforma should be completed alongside the planning application. The Proforma should make reference to the relevant sections of the SWMS. Evidence should be included to show how SuDS are to be incorporated within the proposed development.
Minor development positioned within **5m** of an existing watercourse	Medway Council require the Sustainable Drainage System (SuDS) Proforma to be submitted in support of the application.

Table 5.1 – Requirements for submission in respect to managing surface water runoff from new development.

5.2. Proposed Method of Discharge

Part 4 of Surface Water Drainage Proforma

The method of discharge for all developments must follow the drainage hierarchy as identified within the **Non-statutory Technical Standards for Sustainable Drainage Systems (NTSS)** and Part H3 of the Building Regulations**.** The drainage hierarchy options are summarised below; followed by prescriptive guidance for each of the methods of discharge;

***Infiltration (into the ground)* –** The preferred method for discharging surface water runoff from development sites is via infiltration, directly into the ground. This method of discharge manages the water at source and allows replenishment of the groundwater.

↓

***Surface Waterbody/Watercourse* –** Where infiltration cannot be achieved, the next favoured option is to discharge to a watercourse, or a surface waterbody. This option follows the natural hydrological cycle and can help to promote biodiversity. The waterbody, or watercourse which the development site is proposed to be connected to should be hydraulically linked to a river, or to the sea, to ensure that the risk of flooding offsite is not increased. Appropriate pollution control measures will be required if connecting to a receiving waterbody or watercourse.

↓

***Sewer* –** If neither alternative option for discharging surface water runoff is available (i.e. discharge via infiltration, or to a watercourse), the discharge of runoff to a public sewer may be permitted. Ideally surface water should be discharged to a dedicated surface water sewer (where available), or as a secondary option, to a combined sewer (i.e. foul and surface water). Discharge of surface water to a dedicated foul sewer is strongly discouraged and will only be considered in exceptional circumstances.

5.2.1. Discharging via Infiltration

For all development where it is proposed to use SuDS which rely on infiltration as the *only* option for discharging surface water runoff (i.e. soakaway, infiltration drainage basin, permeable surfacing etc.), infiltration testing is expected to be undertaken following the procedures outlined in BRE Digest 365 (BRE365), appropriate to the nature and size of the site. The results of this testing should be submitted with the planning application and referenced in the SuDS proforma.

If the proposed development cannot be discharged via infiltration, it will be necessary to provide evidence to justify why. This information should take into consideration any specific site constraints, or restrictions which could include, but are not limited to the following:

- Poor ground conditions / limited infiltration rate;
- High groundwater levels (within 1m of the base of the infiltration system);
- Contaminated ground (a contamination report should ideally be provided to support any assumptions made);

- Environment Agency's Source Protection Zones (specify which SPZ the site is located in).

Ground Conditions and Groundwater Levels - Infiltration SuDS will be prohibited if the ground water is shown to be located within 1m from the base of the infiltration system. In some cases where groundwater is expected to prevent the SuDS system from working effectively, the LPA may request further test results are provided to confirm the level of the groundwater at the location of the proposed SuDS, to ensure that the proposed system is suitable.

The scale of ground investigations should be proportionate to the size of the development and as such, for small developments with low groundwater, a single set of testing in accordance with BRE365 would normally be sufficient. For larger sites, it may be necessary to provide evidence to demonstrate that appropriate testing has been undertaken at a number of locations across the site. If the applicant is unsure, the LPA should be contacted to confirm whether this information is required to be provided.

Some sites may be associated with geotechnical hazards whereby solution features within chalk can cause chalk to dissolve. The risks caused by solution features may need to be addressed in any site Investigation report where a risk is identified by British Geological Survey mapping.

Contaminated Ground - Where there is a risk of ground contamination on the existing site, or on sites which are known to have vulnerable ground conditions, additional soil analysis and geotechnical assessments may be required. The requirement to submit this additional information will need to be determined on a site-by-site basis. If the applicant is unsure, the LPA should be contacted to confirm whether this information is required to be provided.

Source Protection Zones - The EA's Groundwater Source Protection Zone maps are required to be referenced if infiltration is proposed, as in some cases this type of discharge may not be considered suitable or indeed acceptable. In such circumstance, approval may be required from the EA before planning permission is granted. The Groundwater Source Protection Zone maps can be accessed at: http://magic.defra.gov.uk/

5.2.2. Discharging to a Tidal Waterbody

When discharging to an existing **tidal waterbody**, unattenuated discharge may be considered acceptable where the proposed outlet is located higher than the maximum water level. It is recognised that the likelihood of the design pluvial event coinciding with an extreme tidal event is extremely low, and as such, joint probability analysis can be undertaken to determine the most appropriate maximum water level. Using this method, it is possible to calculate the approximate time that the tidal outfall will remain blocked, which will influence the volume of storage required to be provided on site.

The storage calculations should ensure that the design rainfall event can be accommodated on site when the outfall is 100% blocked (i.e. due to tide locking). An alternative approach to undertaking joint probability analysis is to assume that the outfall will be 100% blocked for a minimum of six

hours. However, it is acknowledged that the volume of storage required may increase if this methodology is adopted.

In all cases, the first 5mm of rainfall discharged from the site (termed the 'first flush') should be considered and ideally stored on site, to minimise the risk of pollutants being passed on to the waterbody.

Where an outfall passes through a flood defence structure, a flap valve should be provided. The number of outfall pipes passing through a flood defence structure should be kept to a minimum to ensure the integrity of the defence. Where possible, drainage works should be rationalised to reduce the number of small individual outfalls. It will be necessary for the integrity of the flood defence to be protected during construction and to ensure that the works do not work weaken the flood defence.

The visual impact of the finished structure is an important consideration and construction materials should have regard for the local environment. Outfall and headwall design should be agreed with the Environment Agency, as their consent may be required for the construction and for the quantity and quality of discharge. In all cases, the body responsible for both the waterbody and the defence infrastructure should be consulted before any construction works commence.

5.2.3. Discharging to a Watercourse or Surface Waterbody

When it is proposed to discharge to a main river, consent must be obtained from the EA prior to construction commencing on site. Unattenuated discharge to a watercourse, which is the responsibility of either the EA or the Internal Drainage Board (IDB), would require further consultation with the approving body. Typically, unattenuated discharge to a watercourse/waterbody is only permitted if the watercourse/waterbody is shown to be tidally influenced at the point of discharge and if provision has been provided to manage the first 5mm of rainfall – the 'first flush' principle described in Section 5.2.2.

When discharging to an ordinary watercourse, the appropriate authority (e.g. IDB, LLFA) should be consulted prior to the submission of the planning application and any relevant consents must be obtained prior to construction commencing on site.

In all cases, if a connection to a watercourse requires crossing 3rd party land, evidence of a connection agreement from the 3rd party land owner must be provided by the applicant.

The LPA may request evidence to demonstrate that the proposed drainage system can discharge unimpeded (e.g. to show that high water levels will not prevent the site from draining). Non-return valves may also be required to specified in order to prevent the drainage system from back-filling. Evidence can be requested from the LLFA to demonstrate that sufficient storage onsite has been provided in the event that the water levels in the watercourse/waterbody prevent the outfall from discharging at the specified rate.

5.2.4. Discharging to a Sewer

The discharge of surface water runoff from a development to a public sewer will only be permitted if the options listed above (i.e. infiltration and watercourse/waterbody) are shown not to be a viable alternative. Evidence will be required to be submitted to clearly demonstrate that all of the alternative options have been exhausted first and that discharging to a public sewer is the only viable solution.

In the first instance, discharge to a dedicated surface water sewer will need to be considered. If this is deemed not to be feasible (e.g. no surface water sewer in close proximity to the site), the next favoured option would be to discharge runoff from the development into a combined sewer (i.e. a sewer which receives both surface water and foul water). Discharge to a dedicated foul sewer is strongly discouraged.

Consent from the sewage undertaker must be obtained prior to construction commencing on site for all applications which propose to create a new connection to the public sewer system, and/or propose to increase the rate of discharge to the public sewer.

In locations which are known to have historic sewer flooding or sewer capacity concerns, the LPA may request additional information is presented as part of the planning application to demonstrate that discharging runoff from a development is suitable (e.g. sewer capacity checks). This may result in upgrade requirements being imposed *before* the development can progress to the construction phase.

5.3. Development Runoff Rates and Volumes

Part 5 of the Surface Water Drainage Proforma

In order to make an assessment of the peak discharge rates and volumes, it is necessary to calculate the potential runoff rates and volumes, taking into consideration the local geology and rainfall estimates. Typically, runoff rates and volumes are calculated for a range of return period events, including the following;

Design Event: Typically, the SuDS system is designed for the 'design event', including an increase in peak rainfall intensity to account for the impacts of climate change.

Greenfield Runoff Rates: The estimated peak runoff rate from a development site in its greenfield condition is referred to as the 'greenfield runoff rate', and the return period of the rainfall event will dictate the greenfield runoff rate for that specific return period (E.g. 1 in 100 year greenfield runoff rate).

5.3.1. Methods for Calculating Surface Water Runoff Rates

The most contemporary method for calculating the rate and volume of surface water runoff from the site catchment should be applied. In the first instance, industry standard methods (e.g. Flood Estimation Handbook methodology) should be used for calculating runoff rates and volumes. Where this data is not available, or is not considered to be appropriate (e.g. relative to the size of

the development), then the chosen method for calculating the runoff criteria should be clearly stated and supporting evidence provided. It is recognised that methodology for estimating the runoff will be dictated by the local characteristics of individual sites and therefore, where considered necessary, developers should justify the chosen methodology recognising the limitations as described within the section 24 of the CIRIA SuDS Manual.

Surface water runoff rates from brownfield sites can be calculated using the total impermeable area and the most appropriate runoff estimation methodology stated within section 24 of the CIRIA SuDS Manual. The method used to calculate these rates should also be stated within the SuDS proforma.

5.3.2. Limiting Surface Water Discharge Rates

For all developments, it will be necessary to limit the rate at which surface water runoff is discharged from the development in accordance with Standards S2 and S3 of the NTSS. The proposed discharge rates from the developed site should replicate greenfield runoff rates, if practicable.

Where the greenfield runoff rates are less than 2l/s, a maximum discharge rate of 2l/s may be considered acceptable; *but only when all of the other options have been exhausted*. In such circumstances, evidence must be provided to demonstrate to the LPA why greenfield runoff rates cannot be achieved (e.g. risk of blockage).

Development sites located within an SDA can have additional restrictions imposed by the LLFA. These restrictions could include the requirement for additional mitigation measures, designed to reduce the risk of flooding to both the proposed development and to the surrounding area (e.g. flow restrictions). If the applicant is unsure, the LLFA should be consulted to confirm whether this information is required to be provided.

5.3.3. Limiting Surface Water Discharge Volumes

For all developments, it will be necessary to limit the volume of surface water runoff discharged from the site in accordance with Standards S4 to S6 of the NTSS. These Standards outline the preferred methods for volume control. The proposed runoff volume should never exceed the greenfield volume for the 1 in 100 year return period rainfall event with a 6 hour duration.

5.4. Water Quality

Part 6 and 8 of the Surface Water Drainage Proforma

As a guide, SuDS measures should follow the water quality management train set out within the CIRA SuDS Manual C753.

All development must consider incorporating safeguarding measures to protect water quality, such as the ability for the proposed drainage system to remove pollutants before discharging via one of the mechanisms discussed in Section 5.2. The design of any drainage system must ensure that the water quality does not adversely impact the receiving waterbody/aquifer, during both the construction phase and once operational.

Where possible 'at source' SuDS should be prioritised, and development sites should allow for interception storage for the 5mm event – termed 'the first flush event'. Generally, this 'first flush' will contain the majority of pollutants and thus should be held back and treated on-site.

Sites situated within, or adjacent to the following; Natura 2000 sites, Sites of Special Scientific Interest (SSSI), or Wetlands of International Importance under Ramsar Convention (Ramsar site) must provide supporting evidence to demonstrate that the current WFD Environmental Quality Standards (EQS) are met for the specific watercourse the site is being drained into. Where deemed appropriate, further consultation with Natural England may be required before the planning application is submitted.

5.5. Urban Creep

Part 5 of the Surface Water Drainage Proforma. Applicable to major development:

All major developments should consider how the drainage design will function in the future and as such, should include an allowance for potential increases in impermeable surfacing over the lifetime of the development (e.g. resulting from new patios, driveways, extensions etc.). An additional 10% should be applied to all impermeable areas to account for 'urban creep' within the proposed SuDS design. It must be clearly demonstrated that the impact of urban creep has been considered within the calculations submitted.

5.6. Maintenance

It should be made clear to the LLFA/LPA *who* will be responsible for the maintenance of the proposed drainage systems on completion of the development. Typically, this can be the property owner, or alternatively a service maintenance company. Measures should be in place to ensure that the owner/occupier is aware of their maintenance responsibilities and a maintenance regime is required for any critical features that form part of the system.

Medway will consider the adoption of SuDS elements under a S38 Highways Adoption Agreement where the element accepts greater than 50% runoff from the highway.

5.7. Surface Water Management in Construction

It is recognised that during the construction phase of a project there is an increased risk of surface water flooding from the development. The LLFA/LPA may require additional surface water management details to be supplied for the construction phase of the development to ensure the risk of flooding to the proposed development and to the surrounding area is not increased. If the applicant is unsure, the LLFA/LPA should be contacted to confirm whether this information is required to be provided.

5.8. Sensitivity Testing

Part 7 of the Surface Water Drainage Proforma

5.8.1. Exceedance Event

As highlighted above, typically the SuDS system is designed using a 'design event', which is typically classified as a rainfall event with a 1 in 100 year return period, including an increase in peak rainfall intensity to account for the impacts of climate change. However, in accordance with the precautionary principle promoted by the NPPF, it is also necessary to consider the impact of an event which exceeds the design event; termed an *'exceedance event'.*

Evaluating the response of the proposed drainage system under an event greater than the 1 in 100 year event (which includes an allowance for climate change) will help to assess the sensitivity of the system to changes in peak rainfall intensity, and represents any uncertainty in calculating the rainfall hydrograph, or climate change allowance.

It is therefore a requirement for the developer to consider both the impact on-site and off-site, as a result of an exceedance event. Guidance on assessing and designing to accommodate an exceedance scenario can be found in the CIRIA document 'Designing for exceedance in urban drainage – good practice' (C635). Where applicable, a flow route diagram should be provided to show areas where flood water could pond during an exceedance event.

5.8.2. Blockage Event

It is also necessary to consider the implications of a failure of the proposed drainage system. Consequently, the LPA require that the impact is quantified for a scenario where the drainage system becomes 100% blocked. This is of particular importance for development sites where the proposed method of discharge is to a watercourse which could exhibit high water levels. High water levels could prevent the site from discharging surface water, as the outfall could become submerged.

5.8.3. Evaluating the Impacts of a Sensitivity Scenario

Sensitivity testing does not require the developer to design the drainage system to accommodate a 100% blockage scenario, instead the Part 7 of the SuDS proforma is simply designed to *appraise* the sensitivity of the proposed drainage system to such events. This ensures that there is no undue risk to life resulting from a 'residual risk' scenario.

The following points are a guide to enable the developer to consider the impacts on the drainage system, based on the sensitivity tests described above:

On-site impacts: If the proposed drainage system is shown to surcharge under either a 100% blockage, or an exceedance event the following should be considered: *What is the expected depth and velocity of flooding across the site? Can you describe the overland flow route of water leaving the drainage system, based on the topography of the site? What is the risk of internal flooding?*

Off-site impacts: If water is expected to flow off-site during either a 100% blockage, or an exceedance event the following should be considered: *Can you describe the overland flow route of water leaving the site, based on the topography of the site? What is the risk of flooding off-site? e.g. to nearby properties, pedestrian/vehicular access routes etc.*

6. Local Plan Policy Recommendations

The current Local Plan 2003 includes two policies concerning flood risk. Owing to legislative and policy changes, availability of updated flood risk information, and a more holistic approach to flood risk management via the planning system, a number of high level policies have been proposed by Medway Council, which can be supported by specific Development Management Policies at a later date in the Local Plan process.

Policy - Flood and Water Management

Flood Risk Management

- *Ensuring that development has a positive or nil impact on flood risk management interests.*
- *Development that would harm the effectiveness of existing flood defences or prejudice their maintenance or management will not be permitted.*
- *Where development benefits from existing or proposed flood infrastructure, the development should contribute towards the capital costs and/or maintenance of the defences over the lifetime of the development.*

Sustainable Drainage:

- *Development proposals subject to LLFA statutory consultation shall be accompanied with a Surface Water Management Strategy/SuDS Proforma that is appropriate to the scale and nature of the development at risk.*
- *Development should enable or replicate natural ground and surface water flows and volumes via the use of Sustainable Drainage systems (SuDS). Where SuDS are provided, arrangements must be put in place for their management and maintenance over the full lifetime of the development.*

It is further recommended that any high level flood and water management policy includes a cross reference to other related policies concerning landscaping, water quality, water supply, climate change adaptation and open space to facilitate a holistic approach to flood and water management.

7. Conclusions

The National Planning Policy Framework (NPPF 2024) published by the Department for Communities and Local Government, requires Local Planning Authorities (LPA) to apply a risk-based approach to the preparation of their development plans in respect of potential flooding. In simple terms, the NPPF requires LPAs to review the variation in flood risk across their district, and to steer vulnerable development (e.g. housing) towards areas of lowest risk.

Where development is to be permitted in areas that may be subject to some degree of flood risk, the NPPF requires the LPA to demonstrate that there are sustainable options for mitigation available, which will ensure that the risk to property and life is minimised should flooding occur.

In accordance with the NPPF's requirements, this SFRA report provides an evidence base and builds upon the original SFRA which was prepared in 2006 and the latest Herrington Consulting update of April 2020. This latest iteration addresses changes to planning policy and introduces new mapping, which is designed to assist with the appraisal of flood risk and to support better spatial planning.

The main purpose of the new 'Potential Risk of Flooding maps', is to consider the risk of flooding from multiple flood sources now and in the future to assist with the application of the Sequential Test. With an increased awareness of surface water flooding over recent years, it is recommended that planning policy encourages good design for sites which are identified to be at risk of flooding from surface water. Therefore, using these new maps to apply the Sequential Test will allow the risk of flooding to appraised across a wider range of sources, whilst also providing the opportunity to use these maps to apply the Exception Test. This process will help to ensure that development will remain safe from localised flooding into the future.

The update to this SFRA also includes additional information to assist developers to submit planning applications for sustainable developments, taking into consideration flood risk and drainage. This SFRA report clearly identifies that the requirements of a Flood Risk Assessment (FRA) and provides guidance for developers on how to prepare a compliant FRA. In addition, the requirements in relation to surface water drainage are also outlined and further guidance is provided to enable developers to complete the Sustainable Drainage (SuDS) proforma.

In summary this updated SFRA update provides a clear evidence base which will enable Local Plan policies to be developed in the future, relating to the management of flood risk and drainage.

A. Appendices

Appendix A.1 – Historic Flooding

Appendix A.2 – Watercourses and Defence Infrastructure

Appendix A.3 – Administrative Boundaries

Appendix A.4 – Potential Risk of Flooding Map

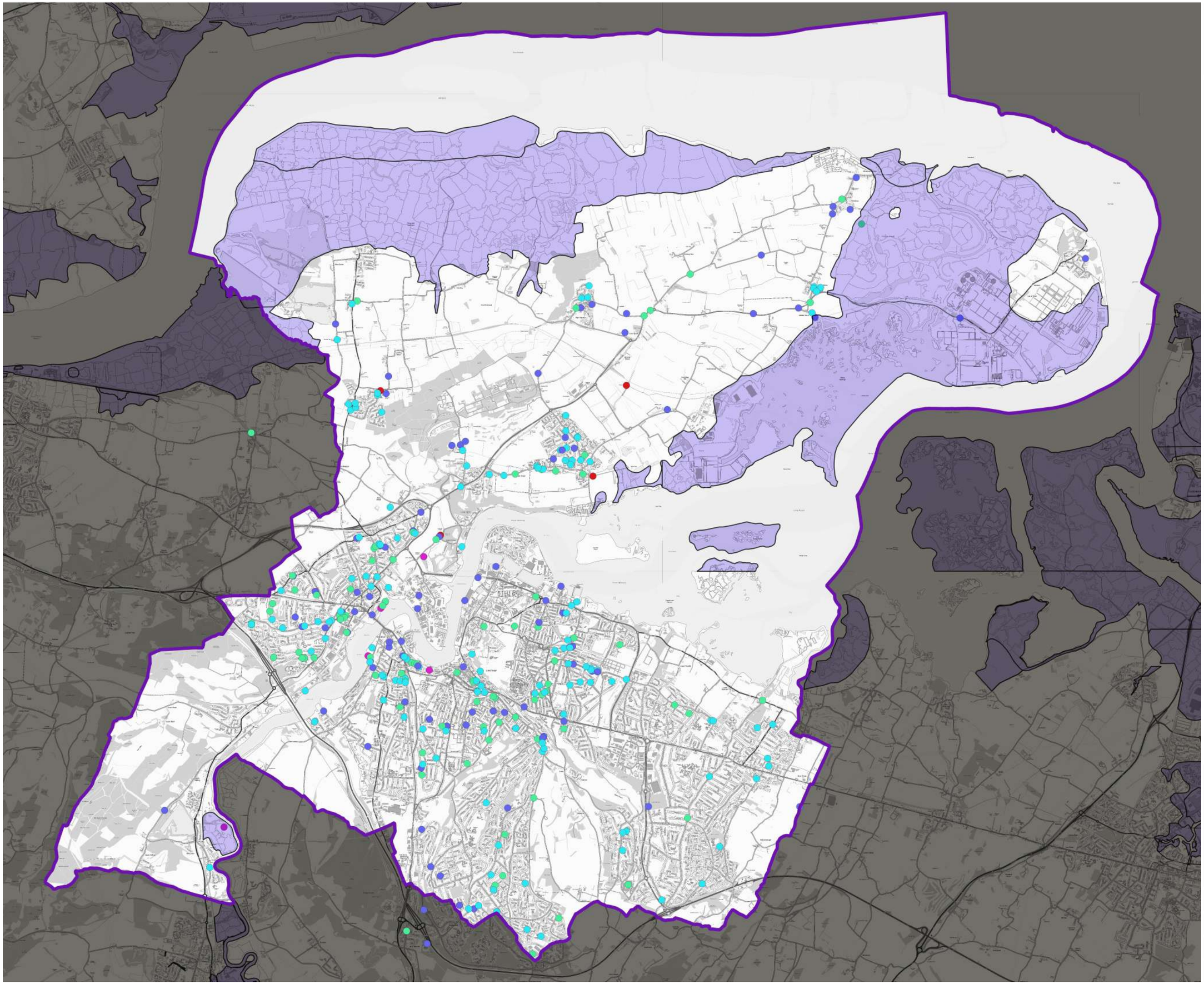
Appendix A.5 – Functional Floodplain

Appendix A.6 – Sustainable Drainage (SuDS) Proforma

Appendix A.7 – Sensitive Drainage Areas (SDAs)

Appendix A.8 – Data Sources

Appendix A.1 – Historic Flooding



TITLE

RECORDS OF HISTORIC FLOODING

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- EA Historic Flood Extents
- River
- Sea
- Sewer
- Surface Water
- Unknown

DETAILS

These historic flood records are a combination of data from remote sensing, ground surveys and staff observations provided by Medway Council and the Environment Agency in 2020. Validated third party data and anecdotal evidence are also included. The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not intended to be viewed at a site-specific scale. These records are the best available at the time of collation, but should not be considered comprehensive. An area without a flood outline does not necessarily imply that there is no risk of flooding. Queries with regard to the recorded flood extents should be directed to the Environment Agency.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	Final issue	13-05-2025

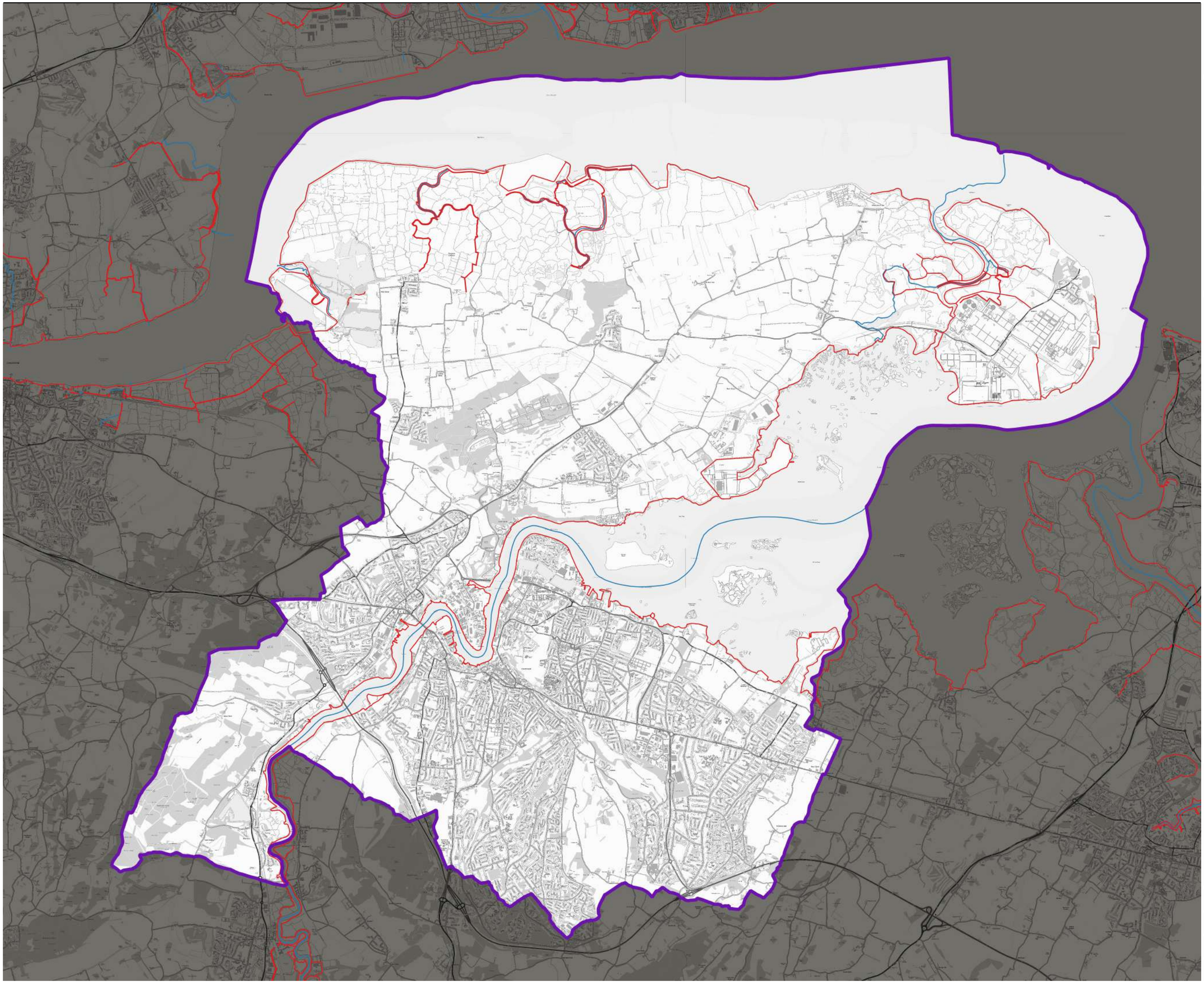
CLIENT Medway Council

PROJECT Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:5110 @ A3	1866	AB	AW

DRAWING No. **Appendix A.1**

Appendix A.2 – Watercourses and Defence Infrastructure



TITLE

WATERCOURSES & DEFENCE INFRASTRUCTURE

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- Flood Defences
- Main River

DETAILS

A number of datasets have been used in the derivation of the mapped extents. The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not intended to be viewed at a site-specific scale. However, due to the methods used in deriving these extents, a more accurate assessment of the distance from a watercourse/defences may be required by the Environment Agency.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington
Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	Final issue	13-05-2025

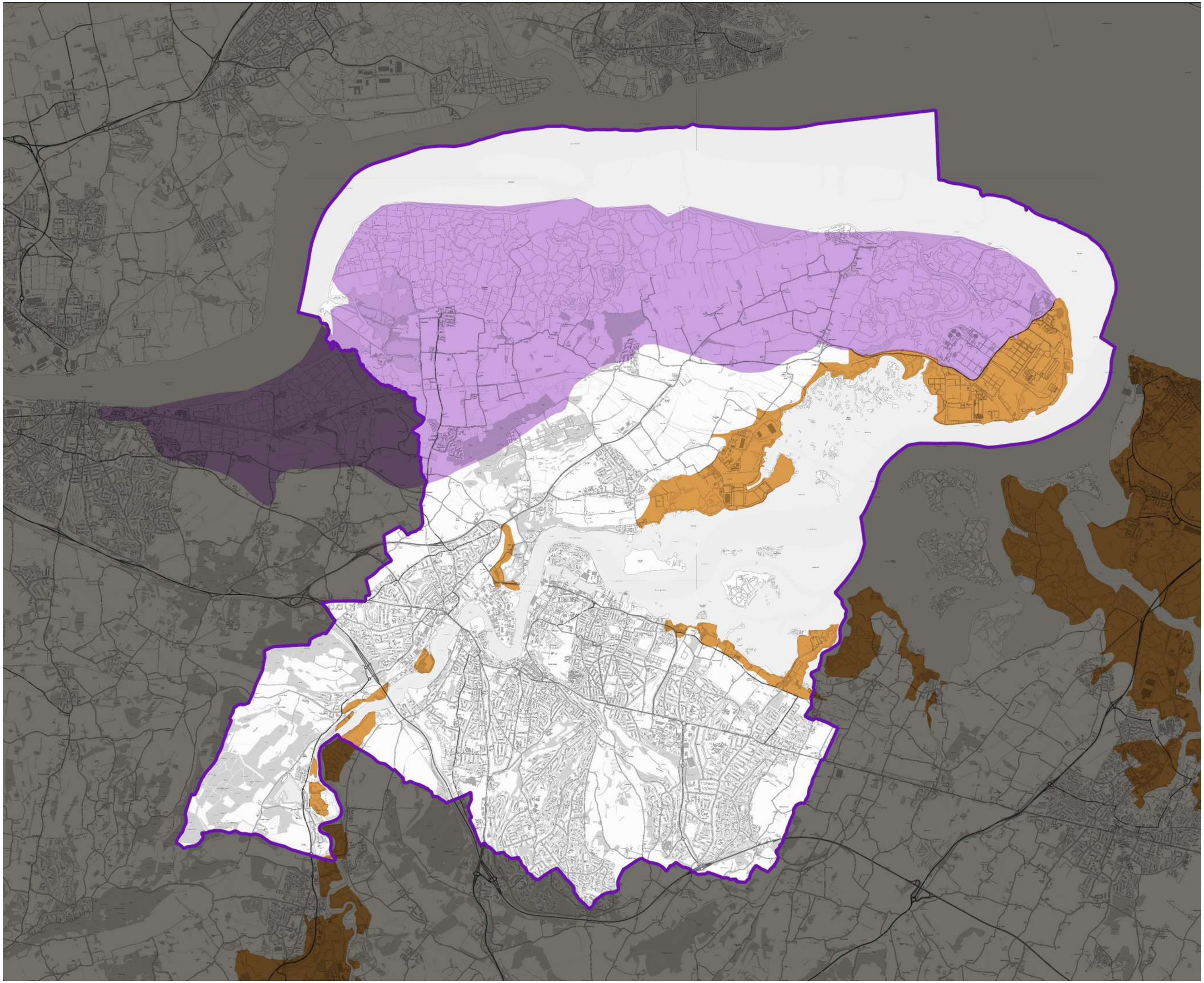
CLIENT
Medway Council

PROJECT
Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:76930 @ A3	1866	AB	AW

DRAWING No.
Appendix A.2

Appendix A.3 – Administrative Boundaries



TITLE

ADMINISTRATIVE BOUNDARIES

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary (LLFA)
- North Kent Marshes IDB
- Lower Medway IDB

DETAILS

The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not intended to be viewed at a site-specific scale. The information presented is the best available at the time of collation, but should not be considered comprehensive.
Queries with regard to the administrative boundaries should be directed to the LPA.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington
Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	Final issue	13-05-2025

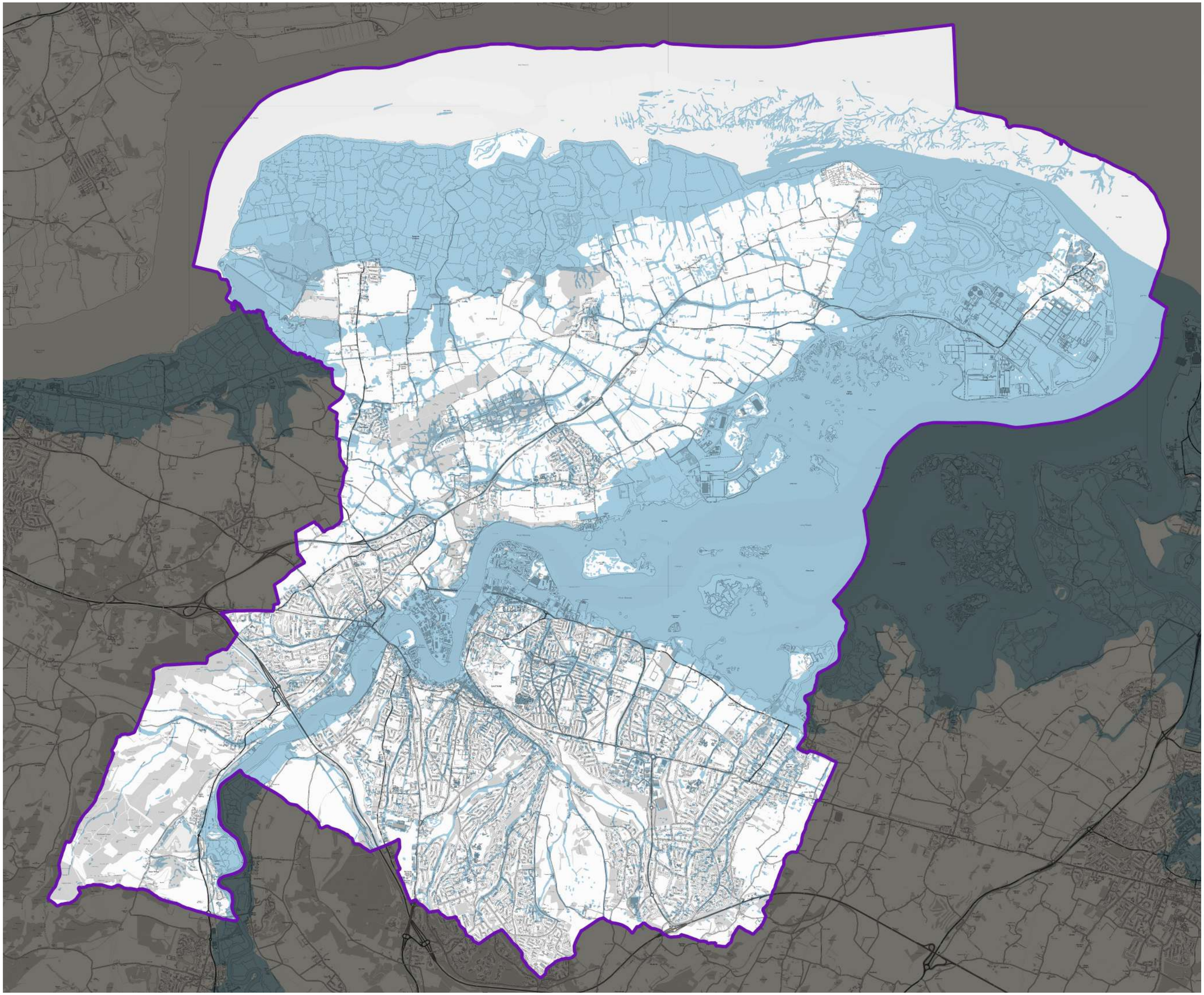
CLIENT Medway Council

PROJECT Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:84816 @ A3	1866	AB	AW

DRAWING No. **Appendix A.3**

Appendix A.4 – Potential Risk of Flooding Map



TITLE

POTENTIAL RISK OF FLOODING (CURRENT DAY - UNDEFENDED)

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- Potential Risk of Flooding

DETAILS

This map is intended for the purposes of applying the Sequential Test. A number of datasets have been used in the derivation of the mapped extents. The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not designed to be viewed at a site-specific scale. Nevertheless, the extents provide an indication of areas potentially at risk of flooding from a number of sources at a strategic level. However, due to the methods used in deriving these extents, a more detailed assessment of the risk of flooding may still be required.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

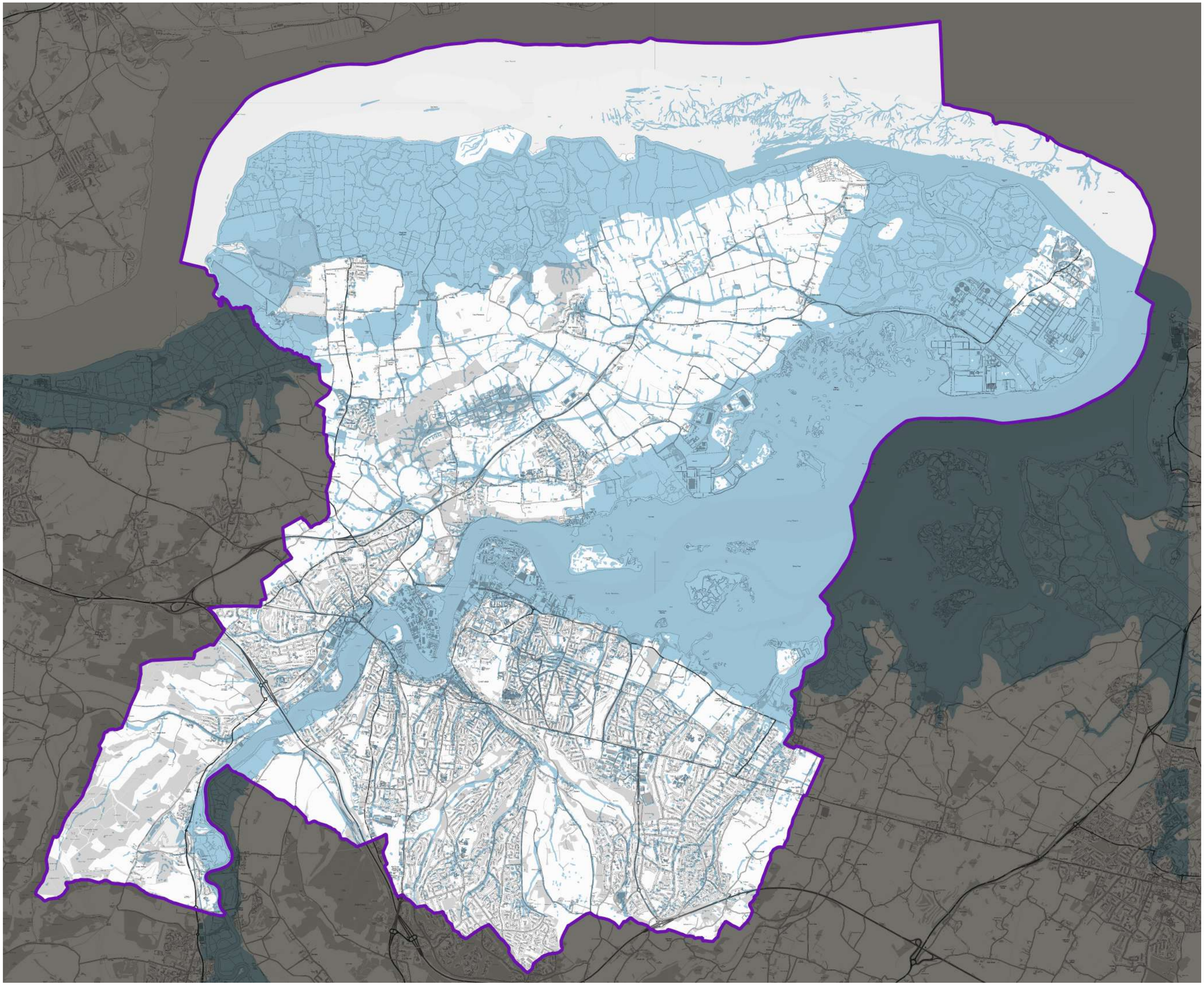
REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	2nd issue	05-06-2025

CLIENT Medway Council

PROJECT Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:71153 @ A3	1866	AB	AW

DRAWING No. **Appendix A.4**



TITLE

POTENTIAL RISK OF FLOODING (CLIMATE CHANGE - UNDEFENDED)

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- Potential Risk of Flooding

DETAILS

The model data references within this mapping does not include the latest allowance for climate change as required by the EA. Nevertheless, the data is the most contemporary available data for the district and therefore has been used to provide an indication of the impacts of climate change. However, it will be necessary to undertake a site-specific Flood Risk Assessment to appraise the risk of flooding under design event conditions.
The extent for the tidal risk of flooding is based on the 1 in 200 year return period for the future year 2115.
The extent for the surface water risk of flooding is based on the 1 in 1000 year return period as a precautionary approach in the absence of any other data.
In some cases, available model data overlaps. Where this is the case, the most recent model data should be referenced. It may be necessary to undertake a Flood Risk Assesment to determine the most appropriate approach.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington
Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	05-06-2025

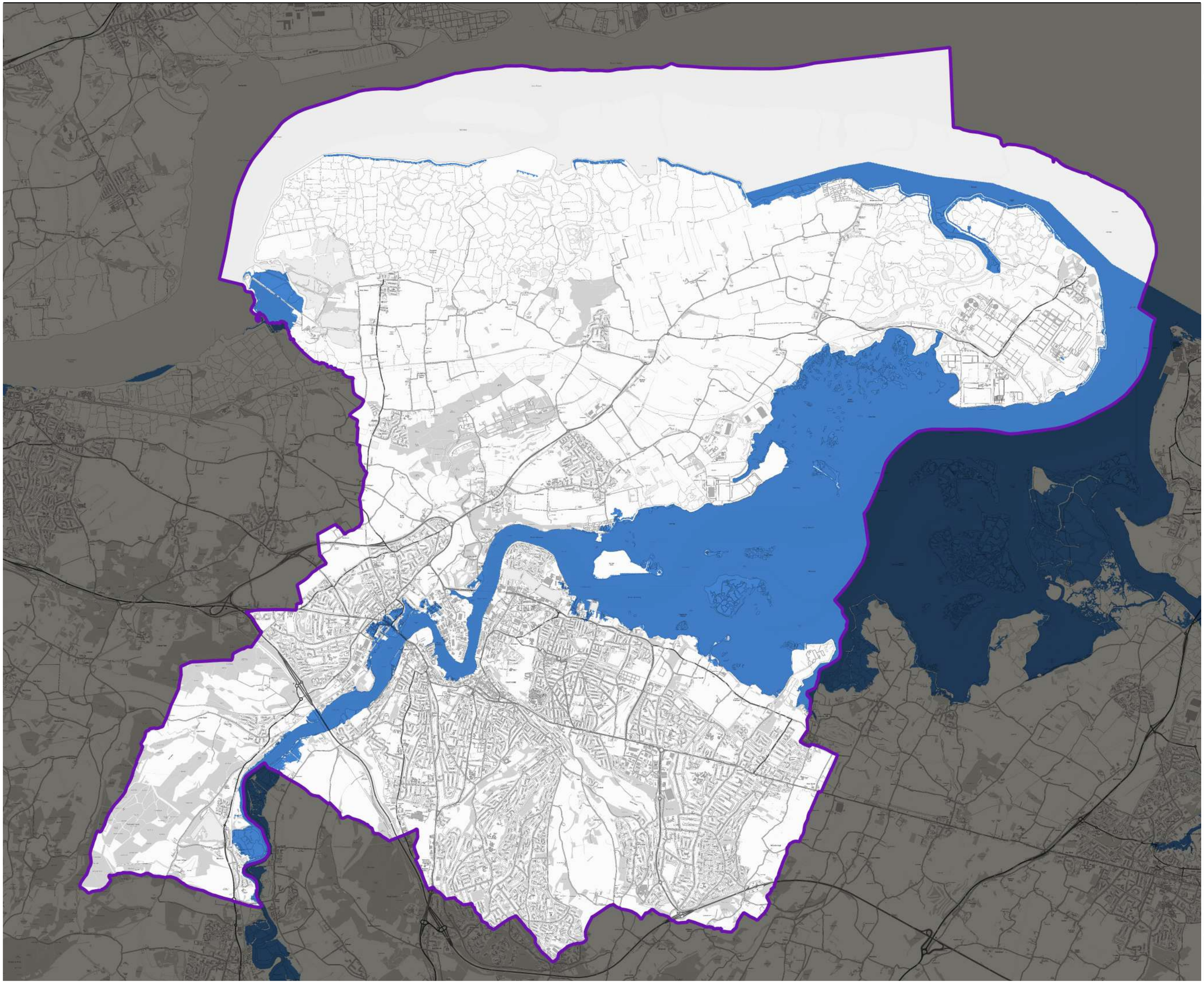
CLIENT Medway Council

PROJECT Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:71228 @ A3	1866	AB	AW

DRAWING No. **Appendix A.4**

Appendix A.5 – Functional Floodplain



TITLE

FUNCTIONAL FLOODPLAIN (FLOOD ZONE 3B)

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- Functional Floodplain (Flood Zone 3b)

DETAILS

The extents shown are based on the results of modelling of the North Kent Coast (Domains 1 and 2) undertaken by the Environment Agency. These maps have been provided in accordance with the National Planning Policy Framework (NPPF). Because the information is indicative rather than specific, Local Planning Authorities will need to consult the Environment Agency on individual planning applications. Users should note that floodplain extents are mapped at 1:10,000 scale, as appropriate to the level of investigation and are based on information available at the time of survey. Ammendments will be required in future to account for information available at the time of survey. Amendments will be required in future to account for information gathered subsequently e.g. changes in hydrological river response or observations following flood events. When in doubt, the Environment Agency should be consulted.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington
Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	Final issue	13-05-2025

CLIENT Medway Council

PROJECT Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:74027 @ A3	1866	AB	AW

DRAWING No. **Appendix A.5**

Appendix A.6 – Sustainable Drainage (SuDS) Proforma

Medway Council – Sustainable Drainage (SuDS) Proforma

This proforma is intended to support planning applications, as specified in Section 5.1 of the Medway Council Strategic Flood Risk Assessment (SFRA) 2024, and provides additional information in relation to the management of surface water runoff from new development. Reference should be made to the Medway Council SFRA (2024), which provides guidance on the management of surface water runoff.

Requirements:

This form is recommended to be completed and submitted in support of all **'major'** planning applications to accompany the required detailed Surface Water Management Strategy, in accordance with the Technical Standards for SuDS. Applications for **'Minor'** development which are located within a Sensitive Drainage Area may be required to submit this form in accompaniment to a Flood Risk Assessment to demonstrate that the use of SuDS has been prioritised. Please contact suds@medway.gov.uk for more information. For all developments classified as **'small development'** this proforma is not required to be submitted. The definition of **'small development'** is specified in Section 3.2.5 of the Medway Council SFRA. Further details are included within Section 5.1 of the Medway Council SFRA.

Summary:

Part 1 – Provide details regarding the site location, development description and site characteristics.

Part 2 – Provide details in relation to the risk of flooding to the development from rivers, the sea and surface water.

Part 3 – Provide details regarding the existing site drainage and current method of discharge.

Part 4 – Provide details of the proposed drainage system.

Part 5 - Provide calculations for the rate and volume of runoff for the pre- and post-development site conditions.

Part 6 – Provide details of SuDS features specified within the proposed drainage system.

Part 7 - Provide details of Sensitivity Testing undertaken (i.e. exceedance and blockage scenarios).

Part 8 – Other considerations (e.g. maintenance and water quality details).

Part 9 – Checklist for submission and declaration.

Part 1 - Site Location and Development Description					
Provide a description of the existing site use:				Please append a site location plan showing; - the site in context to the surrounding area - the application boundary - land ownership boundary (where different from the application boundary)	
Provide a description of the proposed development:					
Is the proposed development on greenfield or brownfield land?					
Is the development classified as 'Householder', 'Minor', 'Non-major' or 'Major'?				*Refer to Section 3.2 of the Medway SFRA for definitions*	
If the development is linked to any other or pre-existing planning applications or other developments, state the planning reference here:				*If the development is linked to other adjacent developments, or pre-existing planning applications, the application should make clear reference to these. It may be necessary to provide combined outlets and discharge rates when assessing the application.*	
State the total impermeable areas for the existing site and proposed development	Impermeable area **pre-development** (area in m^2)		Impermeable area **post-development** (area in m^2)		**Will the development proposals result in an increase in the total impermeable area?**
What is the lifetime of the proposed development?	_____ years		*Refer to Section 2.5 of the Medway SFRA for definitions*		
What is the mapped site geology?	Bedrock		Superficial		Soils (if available)	
British Geological Society Geology of Britain Viewer: http://mapapps.bgs.ac.uk/geologyofbritain/home.html?					

Part 2 – Flooding		
State which Flood Zone the site is located in:		Refer to: https://flood-map-for-planning.service.gov.uk/https://flood-map-for-planning.service.gov.uk/ *(e.g. Flood Zone 1, 2 or 3)*
Is any part of the site at high, moderate, or low risk of surface water flooding based on the Flood Risk from Surface Water maps?		Refer to: https://flood-warning-information.service.gov.uk/long-term-flood-risk/map *(e.g. High/Moderate/Low)*
Is the site located within a Sensitive Drainage Area?		*Refer to the maps included in Appendix A.7 of the Medway SFRA*

Part 3 – Existing Drainage	
Describe the existing drainage system for the site: *Describe where the existing site currently discharges (i.e. via a soakaway, to a river, or to the public sewer). If the site is undeveloped greenfield land, confirm whether this land is currently artificially drained, i.e. via land drainage or ditches.* *The description provided should also state how the site is drained; for example, using gullies or a swale. If the site is classified as 'greenfield', or is assumed to have no formalised drainage system, this should be stated as 'informal drainage' on the SuDS proforma.*	
Does the existing site have a direct connection to a watercourse, or public sewer? *If yes, evidence must be provided*	

Part 4 – Proposed Discharge Method		
	State the method proposed to discharge surface water runoff from the proposed development?	**Justify why you have selected the proposed method of discharge.** *Evidence will be required to demonstrate that you have followed the drainage hierarchy e.g. Infiltration, Watercourse, Sewer (as outlined in Section 5.2 of the Medway Council SFRA).* *If necessary, please append all supporting evidence to this proforma (e.g.; agreements with 3rd parties, infiltration test results, agreements with sewerage undertaker).*
Infiltration		
Connection to a watercourse*		
Connection to a public sewer*		
Other (e.g. highway drain) *describe alternative solution*		
*Please note consent may be required from the relevant authority (e.g. IDB, EA, Southern Water), to discharge to a watercourse or public sewer. Refer to Section 5.2 of the Medway SFRA for guidance.		
Provide a drainage layout plan showing the proposed drainage system, which *must* include the following; • **The location of any SuDS.** • **The location of any outfalls, connections to watercourses, or connections to the public sewer system.** • **Details of the proposed surface water drainage connections.** **A copy of the drainage layout plan must be appended to this proforma.** *The detail of the layout plan should be commensurate with the scale of the development.* *For developments with simple drainage systems a sketch should be sufficient, although Medway reserve the right to request additional information if required.*		

Part 5 – Calculations

Rate of Surface Water Runoff				Volume of Surface Water Runoff	
Return Period *(1 in X Years)*	**(A)** **Provide Pre-development discharge rates for the site** *If the site is greenfield, state the greenfield runoff rate for the developed part of the site.*	**(B)** **Provide Post-development discharge rates for the site** *Calculations should include any mitigation (i.e. SuDS and/or flow control devices) and an allowance for climate change.*	**Calculate the difference between the pre and post development discharge rates.** *i.e. (A) – (B)*	**State the volume of runoff discharged from the site during the 1:100 year 6 hour duration event** *(volume = impermeable area in ha x total 6 hour rainfall in mm x 60)*	
				Pre-development	**Post-development** *Calculations should include any mitigation (i.e. SuDS and/or flow control devices) and an allowance for climate change.*
				m^3	m^3 *
2	l/s	l/s*	l/s	**State whether there is an increase/decrease in either the peak rate of runoff and the volume of runoff discharged from the site?**	
30	l/s	l/s*	l/s	**Rate of Runoff**	Increase / Decrease
100	l/s	l/s*	l/s	**Volume of Runoff**	Increase / Decrease
* Must include an allowance for climate change (Refer to Section 2.5.4).					

State what methodology has been used to calculate the pre- and post-development discharge rates stated above?		*Refer to Section 5.3 of the Medway SFRA for guidance.*
What climate change allowance has been applied to the post development discharge rates when designing the drainage system?	_____%	*Refer to Section 2.5.4 of the Medway SFRA for guidance.*
Has an allowance for urban creep been applied to the calculations?	_____%	*Refer to Section 5.5 of the Medway SFRA for guidance*
Has a flow control device been used to restrict post-development discharge rates? *If yes, state the flow control device that has been specified (e.g. vortex flow control device/orifice plate/pipe)*		

Please append a copy of the calculations used to complete Part 5.			
Part 6 – SuDS			
List of SuDS used within the drainage strategy	**Description**	**Volume of storage within each of the proposed SuDS**	**Where does the SuDS discharge to? (e.g. public sewer system, another SuDS feature, directly to the ground)**
E.g. Soakaway…	*E.g. dimensions, crate/rubble/ring soakaway*	m^3	*E.g. directly to the ground via infiltration*
		m^3	
		m^3	
		m^3	
		m^3	
If SuDS have <u>not</u> been included within the proposed drainage system, provide justification:			

Part 7 – Sensitivity Testing		
Sensitivity Testing – the proposed surface water drainage system should be tested for the following scenarios:		
Sensitivity Test:	**Is the capacity of the system exceeded? Would flooding occur? State which SuDS elements would flood.**	*If the system floods under either scenario, provide a drawing identifying overland flow routes, or areas where floodwater is likely to pond.* Refer to Section 5.8 of the Medway SFRA for guidance on how to complete this section.
Exceedance *(i.e. event greater than the design rainfall event)*		
Blockage *(i.e. 100% blocked outfall)*		

Provide details of any additional mitigation measures which have been incorporated into the drainage system to reduce the risk of failure or lessen the impact of a flooding: *(e.g. additional storage capacity, overflow pipes, spillways etc.)*	
Part 8 – Other Considerations	
State who will be responsible for the maintenance of the drainage system and any SuDS following construction. *(e.g. management company, home owner)* (Refer to Section 5.6 of the Medway SFRA)	
What measures will be put in place to ensure the maintenance requirements are conveyed to the responsible party (above) following construction? *(e.g. a maintenance and management plan included within the owners-manual given to all future land owners.)* Refer to Section 5.6 of the Medway SFRA	
Provide details of; - **how interception storage has been provided to manage the first 5mm of rainfall (i.e. the 'first flush'), and;** - **any other pollution control measures specified** Refer to Section 5.4 of the SFRA	

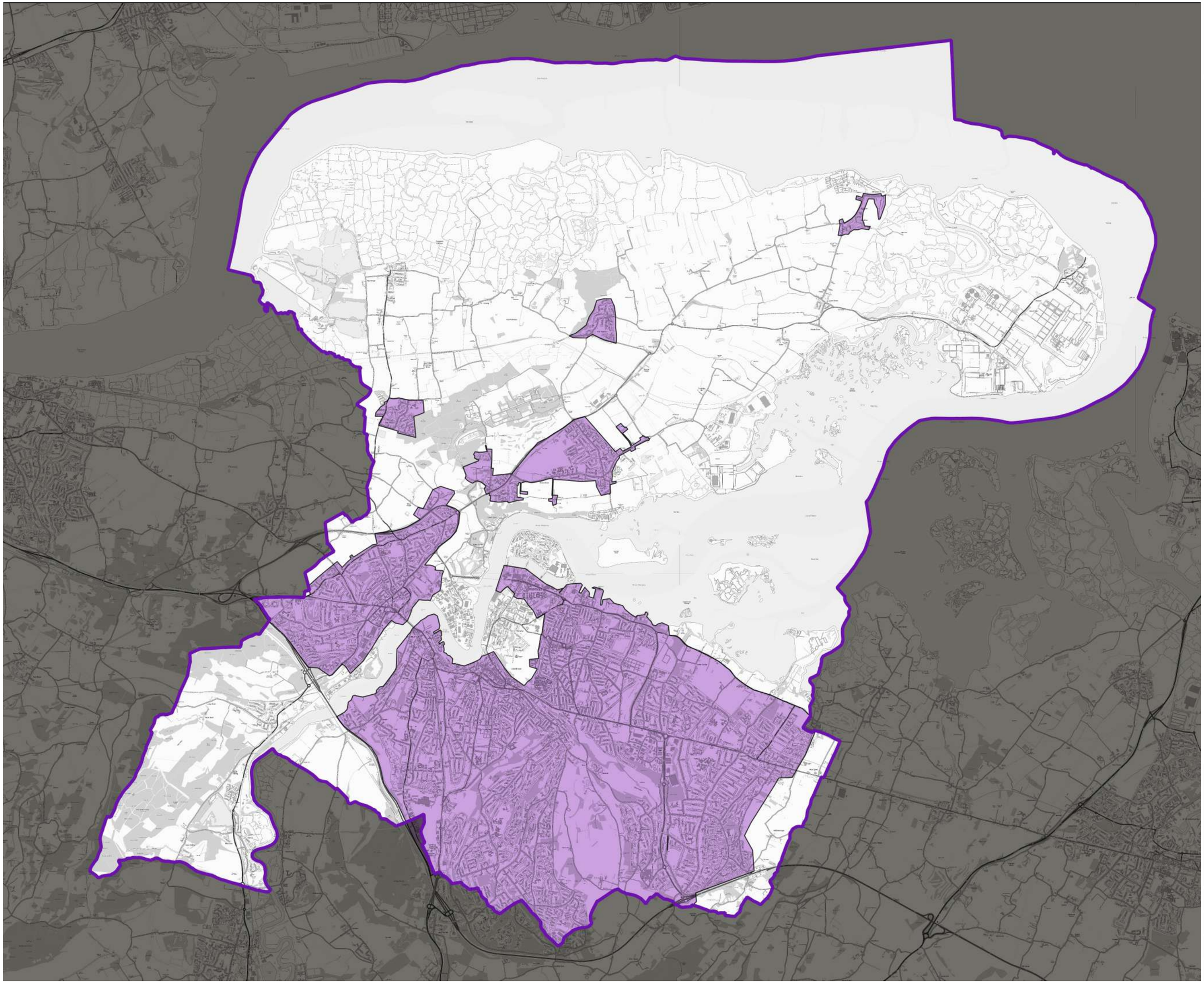
Part 9 – Declaration

The following information is required to be submitted alongside this proforma. Please tick to confirm information has been appended:

- ❒ *A site location plan [compulsory].*
- ❒ *If MAJOR development – Submit a detailed SWMS and reference relevant page numbers in proforma.*
- ❒ *Evidence for proposed method of discharge (e.g. infiltration test results) [compulsory]*
- ❒ *An indicative drainage layout plan or sketch [compulsory].*
- ❒ *Supporting calculations [compulsory].*
- ❒ *Sensitivity test calculations and diagram showing flow routes/areas of ponding [where applicable].*
- ❒ *Other information (e.g. topographic survey, CCTV drainage survey, groundwater monitoring reports). [where required]*

By signing, I declare that, to the best of my knowledge, all of the information provided is correct on the date of completion.
Signed by:
Date:
Please note Medway Council can request that additional information is provided in support of this proforma.

Appendix A.7 – Sensitive Drainage Areas (SDAs)



TITLE

SENSITIVE DRAINAGE AREAS

Medway Council
Strategic Flood Risk Assessment

LEGEND

- Medway Administrative Boundary
- Sensitive Drainage Areas (SDAs)

DETAILS

This map has been prepared based on a number of datasets which are derived at a range of scales. Consequently, caution should be taken when interpreting this information at a site-specifc scale. This mapping should be read in conjunction with the Medway Council's SFRA.

NOTES

1. This drawing contains Ordnance Survey data © Crown copyright and database copyright 2025.
2. All dimensions are in metres unless otherwise stated
3. All heights are in metres Above Ordnance Datum Newlyn (mAODN) unless otherwise stated

Medway Council

herrington
Part of eps

Canterbury, London, Cambridge, Bristol, Leeds

REV	DESCRIPTION	DATE
1	1st issue	16-01-2025
2	Final issue	13-05-2025

CLIENT: Medway Council

PROJECT: Medway Council Strategic Flood Risk Assessment

SCALE	PROJECT No.	INITIALS	CHECKED BY
1:74778 @ A3	1866	AB	AW

DRAWING No.: **Appendix A.7**

Appendix A.8 – Data Sources

Data Layer	Source
OS VectorMap	Ordnance Survey
OS 1:250 000 mapping	Ordnance Survey
Historic flood extents	Environment Agency
Historic flood records	Medway Council Lower Medway IDB Fire and Rescue Southern Water
Flood Zones 2	Environment Agency
Flood Zone 3	Environment Agency
Flood Risk from Reservoirs	Environment Agency
Flood Risk from Surface Water	Environment Agency
1 in 30 year flood extents	Environment Agency
Detailed River Network	Environment Agency
Drainage Network	Southern Water
Internal Drainage Board Areas	Medway Council
Geology	British Geology Survey
Spatial Flood Defences	Environment Agency
District boundary	Medway Council