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**LEGEND**

-  Council Boundary
-  Flood Storage Areas
-  Main River
-  Ordinary Watercourse
-  Culvert

**NOTES**

1. Main rivers are usually larger rivers and streams (designated by the Environment Agency (EA)), other rivers are called 'ordinary watercourses'. The EA carries out maintenance, improvement or construction work only on Main Rivers to manage flood risk. Lead local flood authorities, district councils and internal drainage boards carry out flood risk management work on ordinary watercourses.

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Project Title **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title **STUDY AREA**

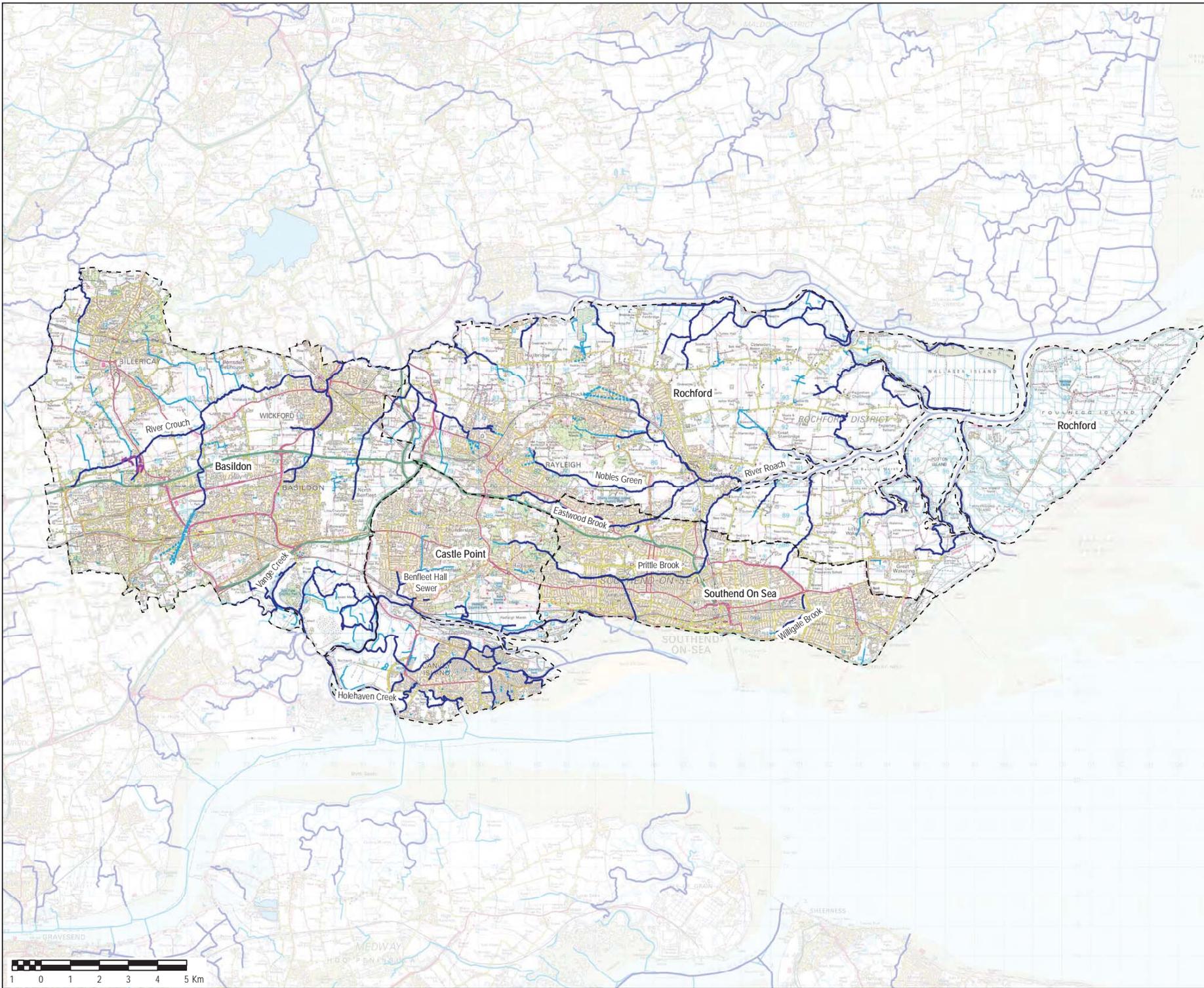
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Drawing Number **FIGURE 1.0** Rev **1**



File Name: \\ba-wp-0031700 - Water\Water New4 - PROJECT\S60532482 - South Essex SFRA\Map\_GIS\Project\Final\Map\Fig 1.0\_Study Area.mxd

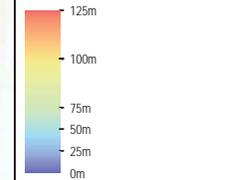


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**LEGEND**

-  Council Boundary
-  Main River
-  Ordinary Watercourse
-  Culvert

**LIDAR Topographic Survey (m AOD)**



**NOTES**

1. Light and Detection Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground.
2. This dataset has a spatial resolution of 2m. The Environment Agency's LIDAR data archive contains digital elevation data derived from surveys carried out since 1995.
3. Accurate elevation data is only available for 70% of England, therefore any areas without LIDAR coverage within South Essex are shown as clear on the map.

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Project Title  
**SOUTH ESSEX  
 LEVEL 1 SFRA**

Drawing Title  
**TOPOGRAPHY**

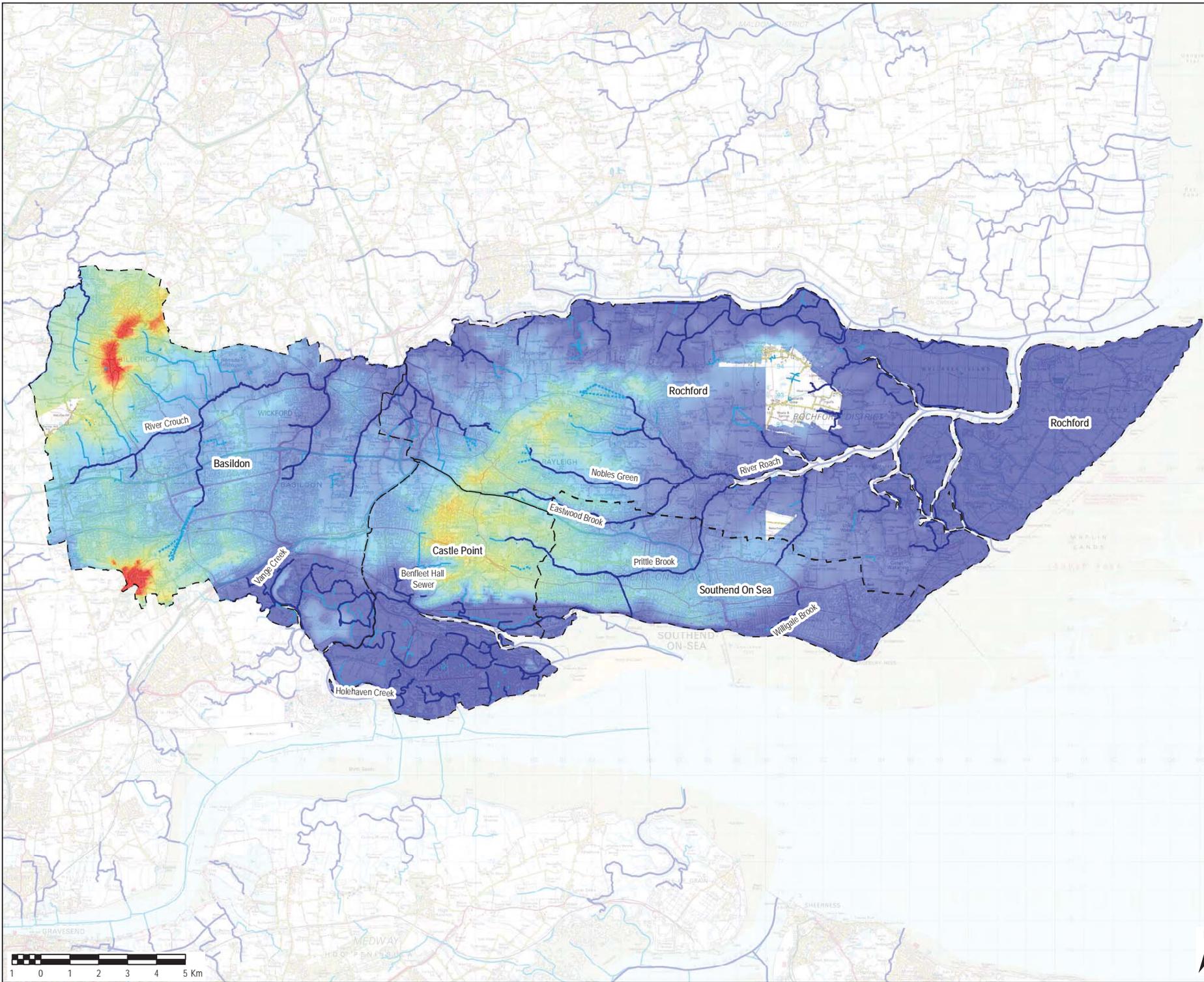
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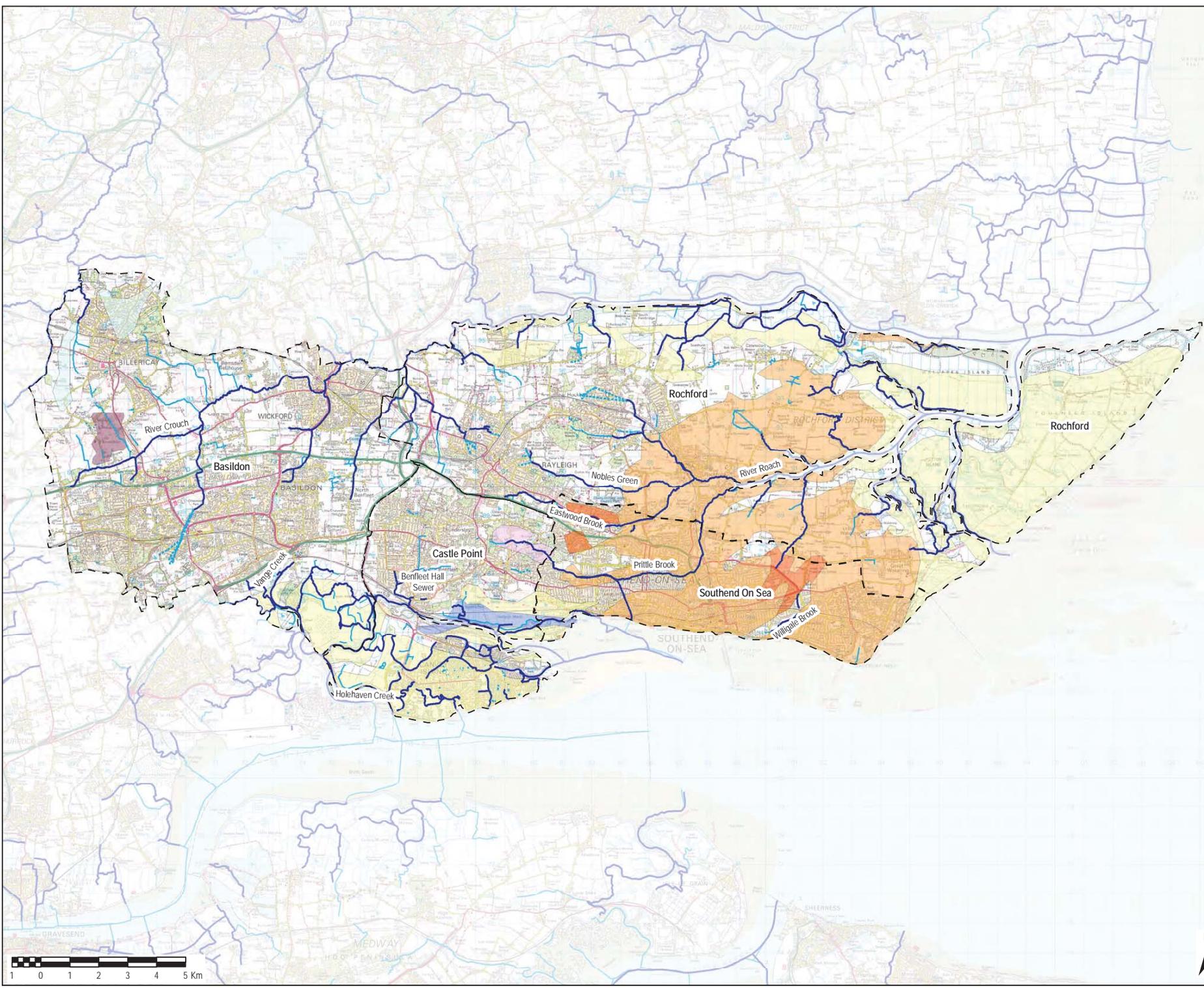
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Drawing Number <b>FIGURE 2.0</b>	Rev <b>1</b>
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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Alluvium
- Brickearth
- Glacial Sand and Gravel
- River Terrace Deposits (Undifferentiated)
- Sand and Gravel of Uncertain Age and Origin
- Landslip
- Till

**NOTES**

1. The British Geological Survey (BGS) data at the 1:625,000 scale as illustrated on this map is generalised and geological interpretation should be used only as a guide to geology at a local level. Detailed site investigations are required to provide site specific geological data.

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Client:

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **SUPERFICIAL GEOLOGY**

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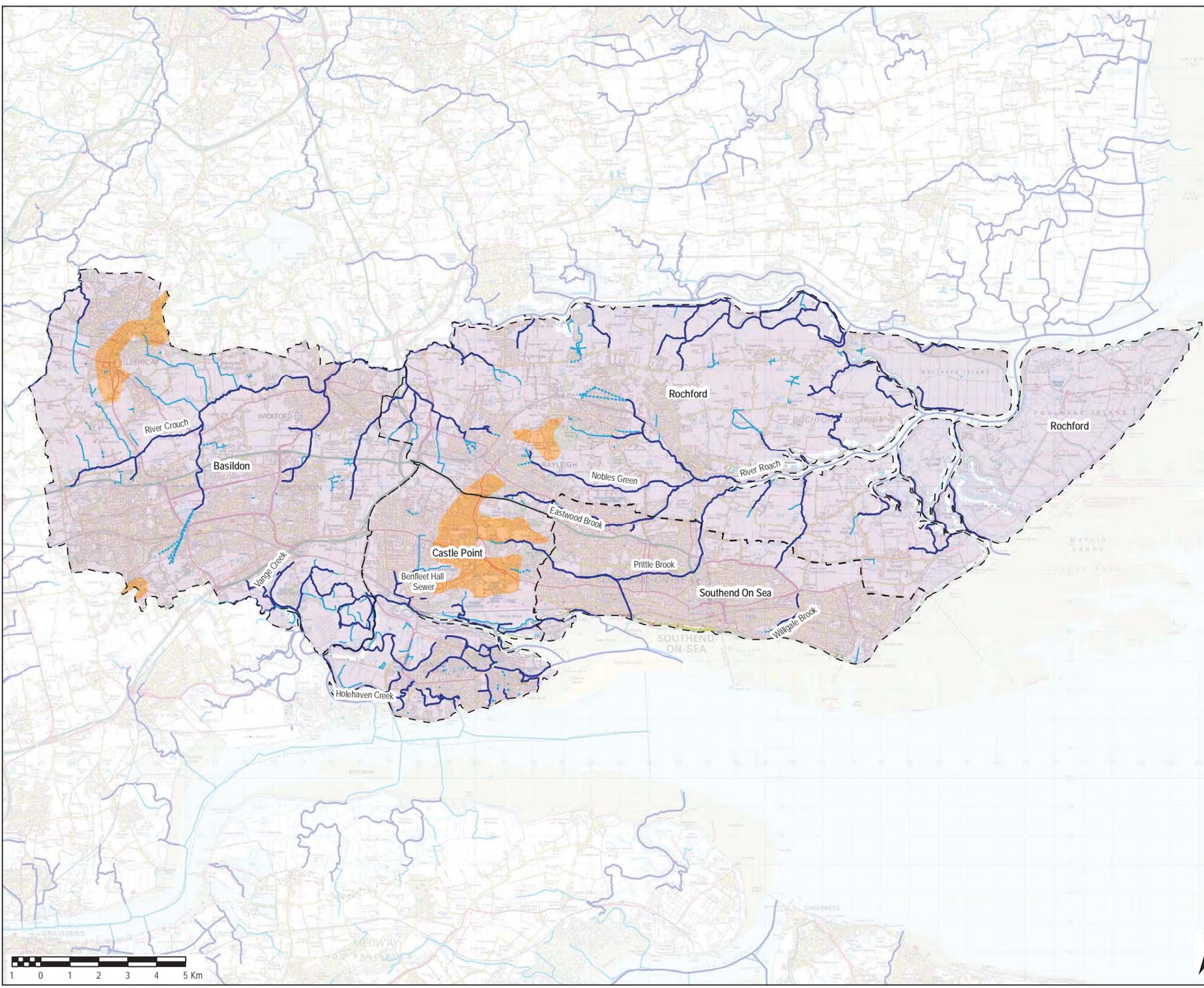
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Drawing Number: **FIGURE 3.1**      Rev: **1**

File Name: \\ba-wp-003\700 - Water\Water New4 - PROJECT\SFRM\GIS\Project\Files\MSX\Fig3.1 - Superficial Geology.mxd



File Name: \\ba-wp-0031700 - Water\Water New4 - PROJECT\S603516\6532482 - South Essex SFRM\GIS\Project Files\MXD\Figure 3.2 Bedrock Geology.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**Bedrock Geology**

- Bracklesham Group and Barton Group (Undifferentiated) - Sand, Silt and Clay
- Thames Group - Clay, Silt, Sand and Gravel

**NOTES**

1. The British Geological Survey (BGS) data at the 1:625,000 scale as illustrated on this map is generalised and geological interpretation should be used only as a guide to geology at a local level. Detailed site investigations are required to provide site specific geological data.

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Basildon Council

castlepoint

Rochford District Council

southend onsea

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **BEDROCK GEOLOGY**

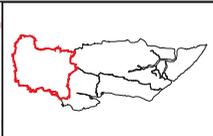
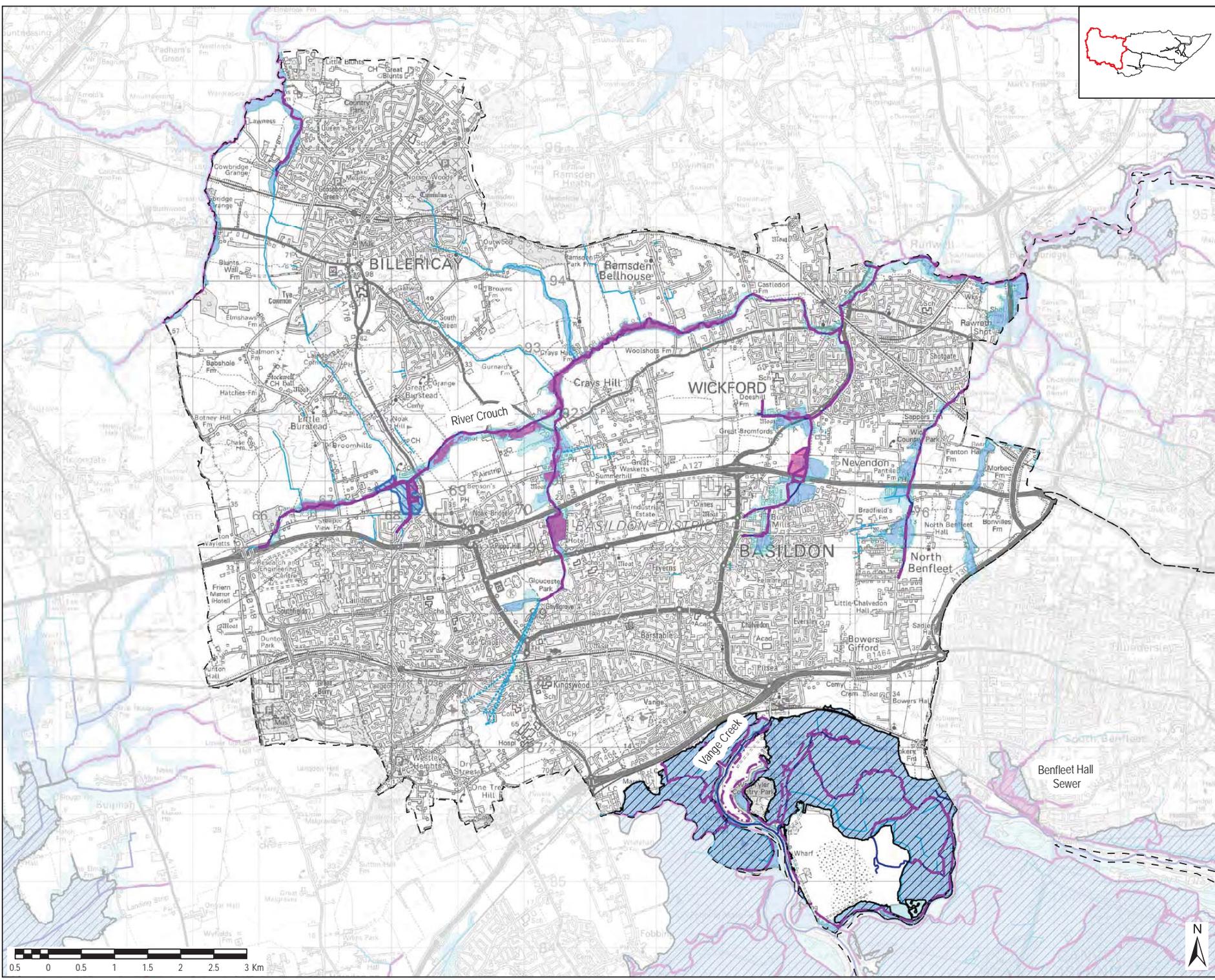
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Drawing Number: **FIGURE 3.2**      Rev: **1**

File Name: \\ba-wp-0031-070 - Water\Water New4 - PROJECTS\605316\60532482 - South Essex SFRA\AEC\GIS\Project Files\MXDs\Figure 4.1.1.1.1 Fluvial and Tidal Flood Zones.mxd



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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Flood Defence (AIMS)
  - Area Benefiting from Flood Defence
  - Flood Storage Area
  - Flood Zone 2 (0.1 AEP)
  - Flood Zone 3 (1% AEP fluvial, and 0.5% AEP tidal)
  - Flood Zone 3b (5% AEP)

**NOTES**

1. Flood Zone 2 and Flood Zone 3 are taken from the Environment Agency's Flood Map for Planning. This Environment Agency Flood Zone data defines the extent of flooding from rivers and the sea without considering the presence of flood defences. The reason for this approach is to make an allowance for the residual flood risk in the event of a failure or breach/over-topping of the flood defences. This approach raises the awareness of flood risk in defended areas and helps to ensure that this is not discounted as part of development, but is managed approximately.

2. Flood Zone 3b is defined using modelled extents for the 5% AEP fluvial event where modelled data was available.

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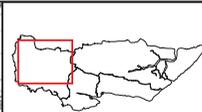
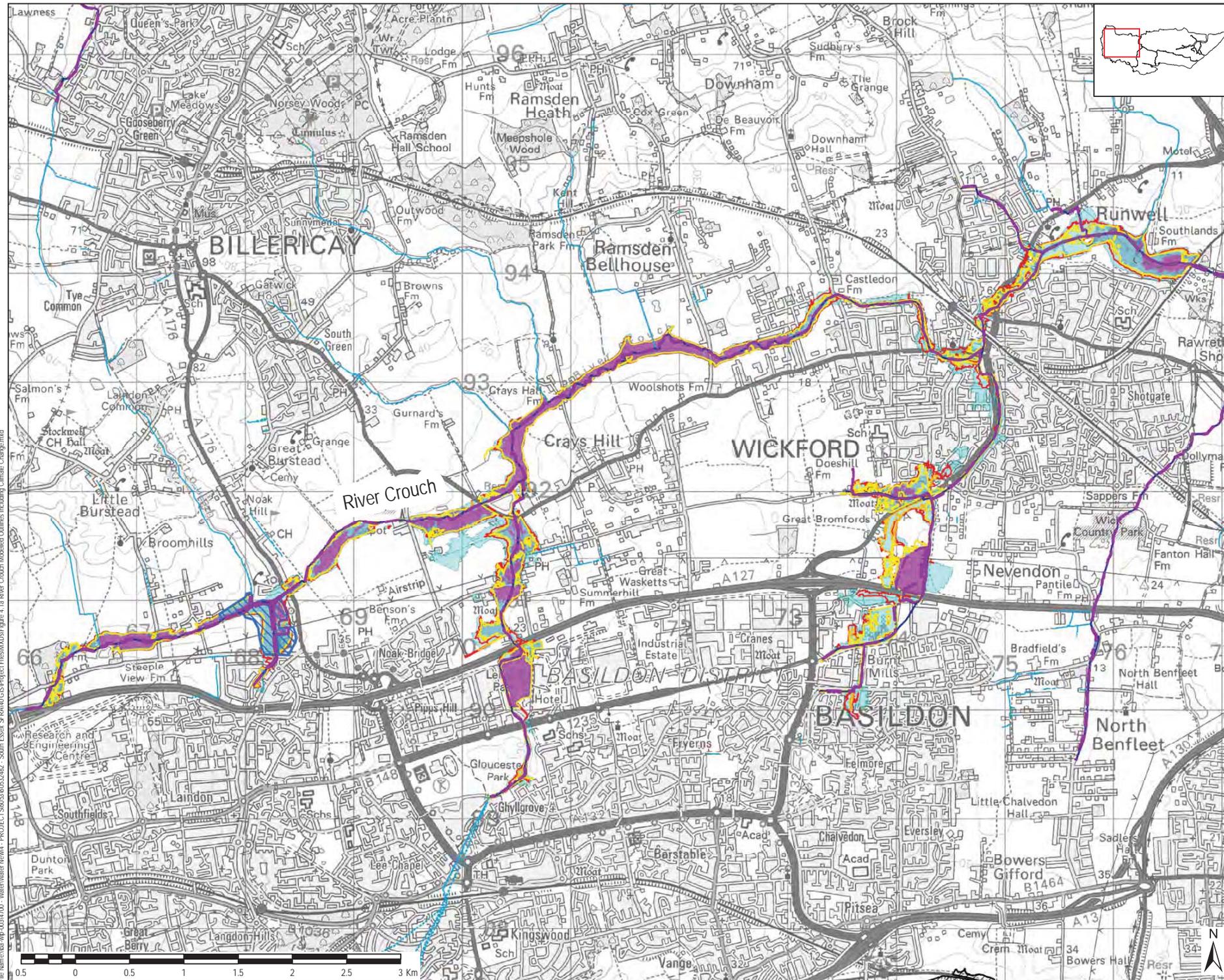
Drawing Title: **FLUVIAL AND TIDAL FLOOD ZONES**

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Drawing Number: **FIGURE 4.1** Rev: **1**



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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Flood Defence (AIMS)
  - Area Benefiting from Flood Defence
  - Flood Storage Area
  - Modelled 0.1% AEP Outline
  - Modelled 1% AEP Outline
  - Modelled 5% AEP Outline
  - Flood Zone - Climate Change 1% AEP + 25%
  - Flood Zone - Climate Change 1% AEP + 35%
  - Flood Zone - Climate Change 1% AEP + 65%

**NOTES**  
 Hydraulic modelling of flooding from the River Crouch defines the extent of flooding during a 0.1% AEP, 1% AEP and 5% AEP flood event. The modelling considers the presence of flood defences.  
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Drawing Title: **RIVER CROUCH MODELLED OUTLINES INCLUDING CLIMATE CHANGE**

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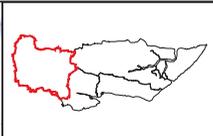
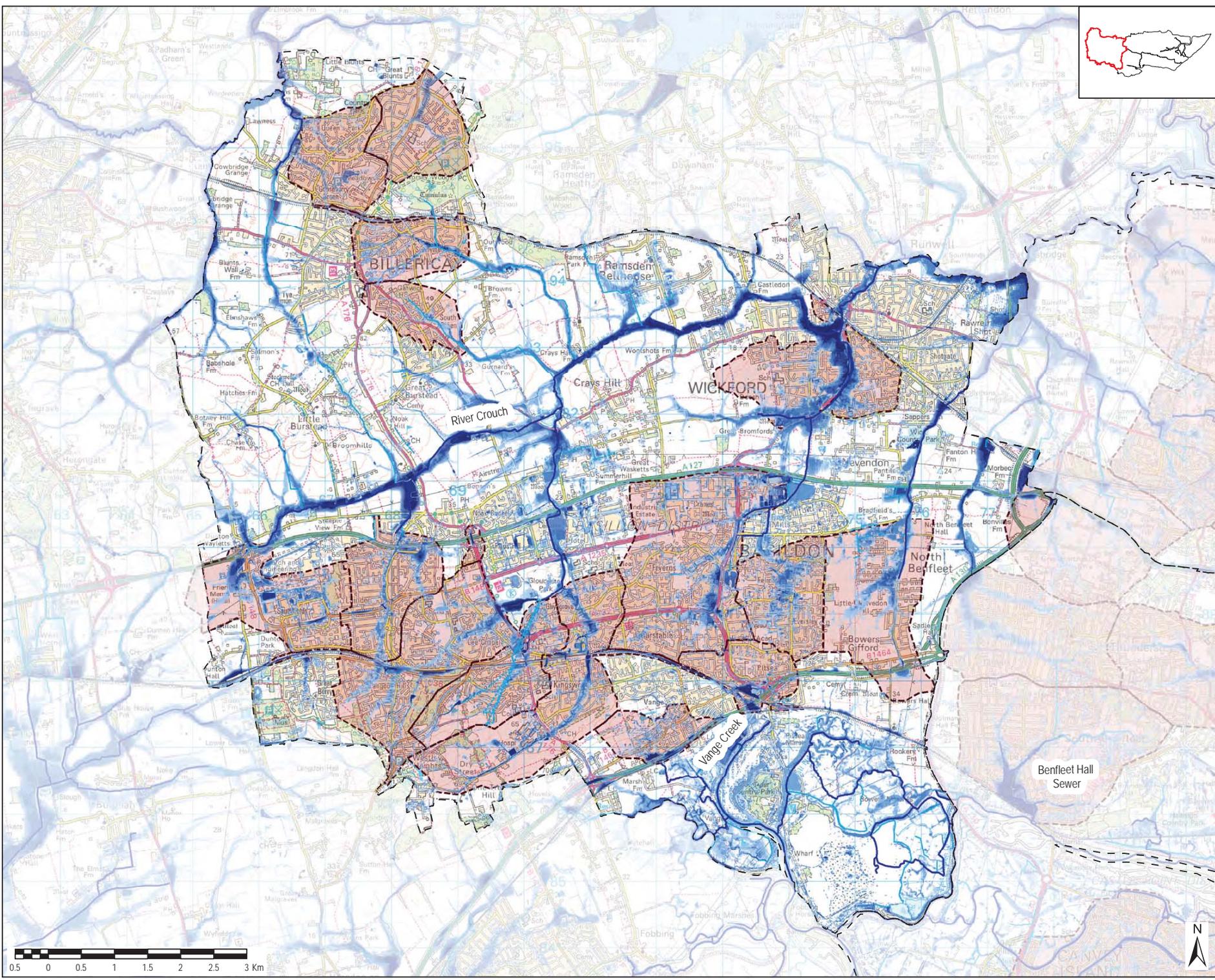
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Drawing Number: **FIGURE 4.1A** Rev: **1**

File Name: \\na-app-003\0700 - Water\Water\New4 - PROJECT\560516\6532482 - South Essex SFRA\AECOM\Project\Figures\Figure 4.1a River Crouch Modelled Outlines Including Climate Change.mxd

File Name: hba-wp-0031-070 - Water/Water Main4 - PROJECT: S60516/6532482 - South Essex SFRA/Map/GIS/Project Files/MSDFigure-4.2-S60516/6532482 - Risk of Flooding from Surface Water.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Area of Critical Drainage
- 1 in 30 year (3.3% annual probability)
- 1 in 100 year (1% annual probability)
- 1 in 1000 year (0.1% annual probability)

**NOTES**

1. This map shows the predicted likelihood of surface water flooding based on the Environment Agency's updated Flood Map from Surface Water data, which may be subject to further analysis in the future.
2. The Risk from Surface Water Flooding is divided into three categories:
  - Low: each year the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%)
  - Medium: each year the chance of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%)
  - High: each year, the chance of flooding is equal to or greater than 1 in 30 (3.3%)
3. The potential impact of surface water flooding can vary according to the depth of water and velocity (speed and direction of flow).
4. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
5. This map is intended to provide strategic overview of susceptibility to surface water flooding and should not be used to assess flood risk for individual properties.
6. Area of Critical Drainage are based upon the Local Flood Risk Management Strategy.

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Drawing Title: **RISK OF FLOODING FROM SURFACE WATER**

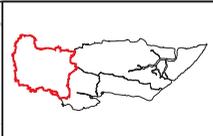
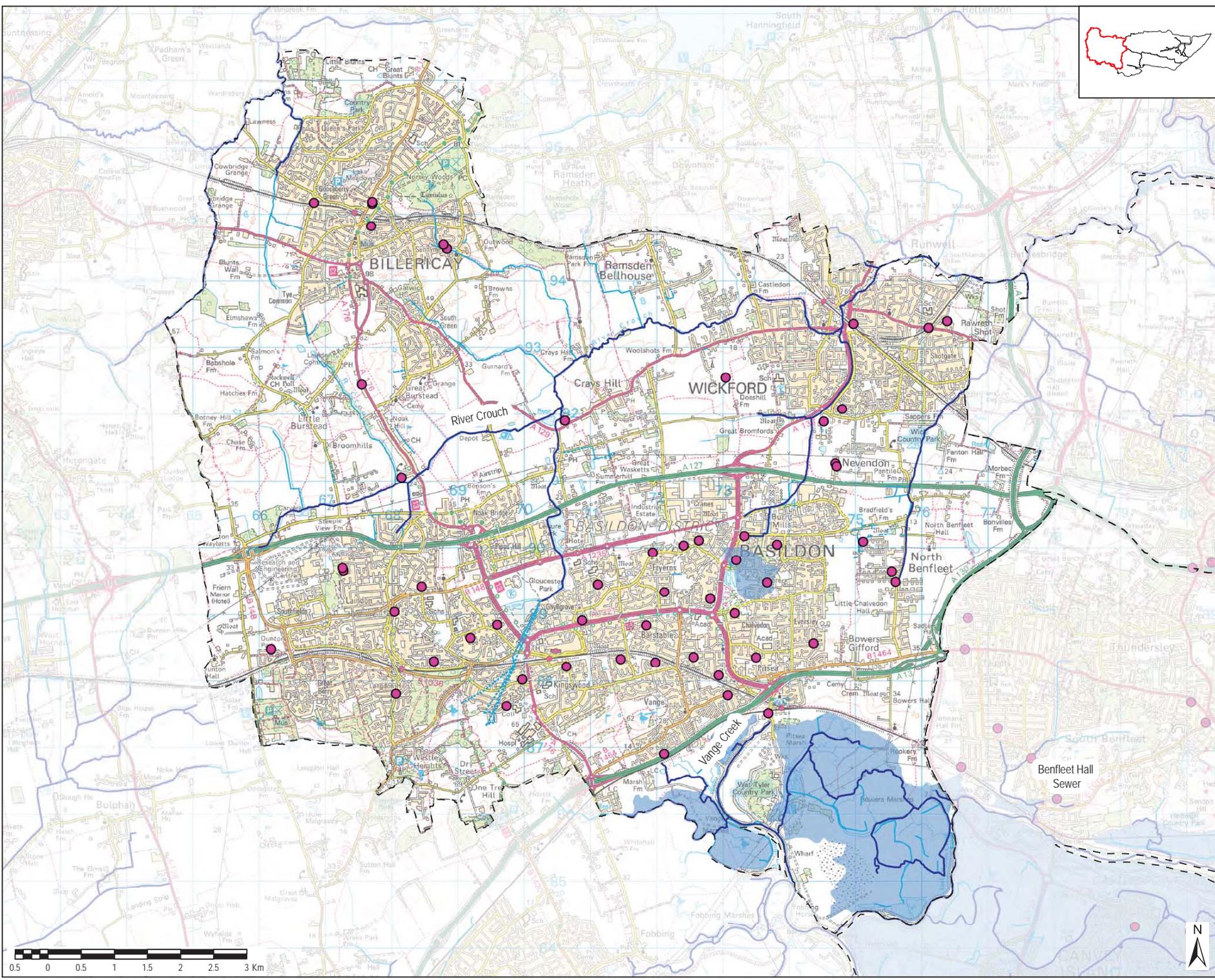
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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Historic Flood Map
- Record of Flooding (Unknown Source)

**NOTES**

1. Flood records do not refer to internal property flooding, rather area that have been susceptible to flooding in the past. Further detail is included in Appendix A of this report.

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Drawing Title: **HISTORIC FLOOD MAP**

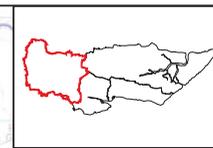
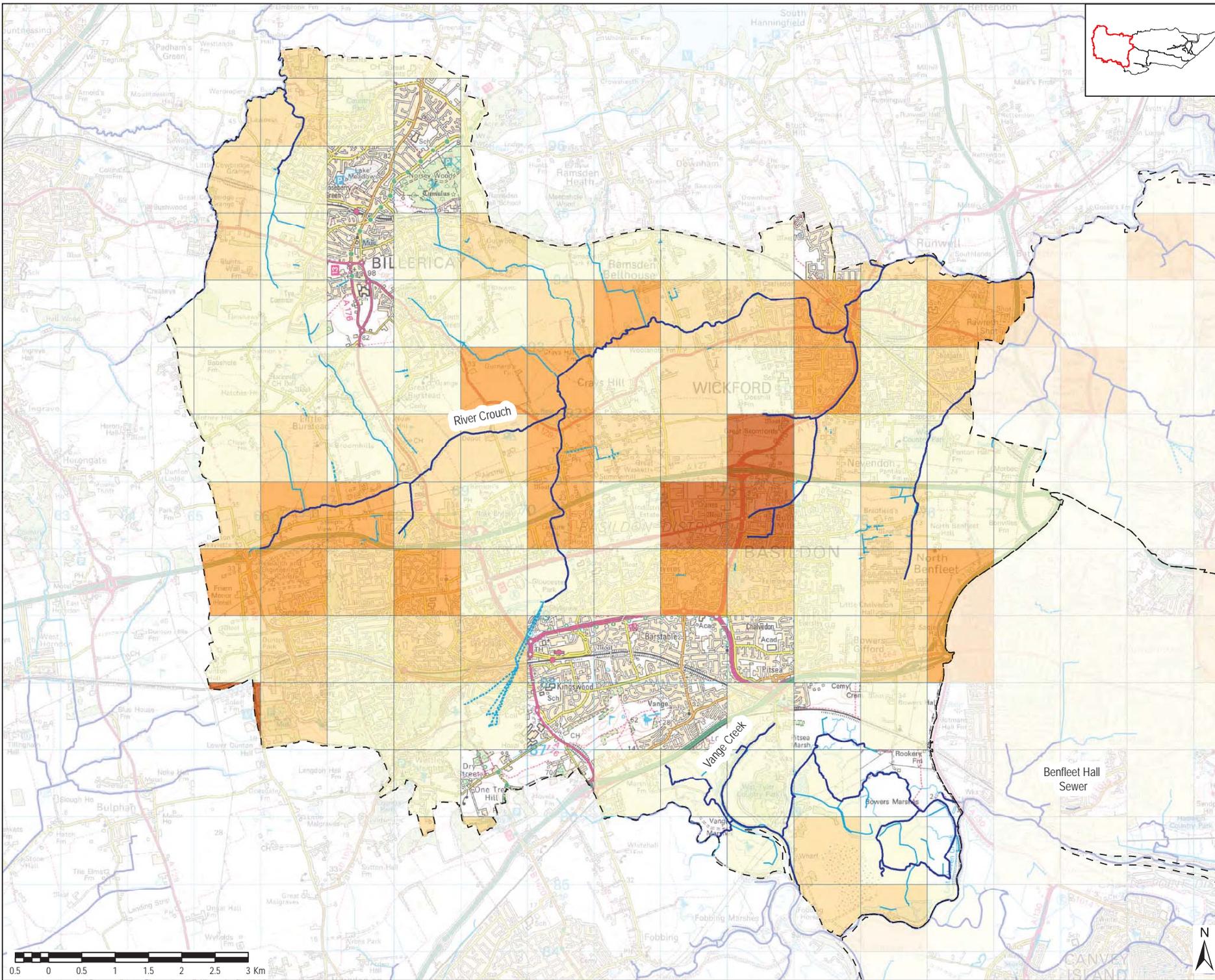
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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**Areas Susceptible to Groundwater Flooding - Level of Risk**

- $\geq 75\%$
- $\geq 50\% < 75\%$
- $\geq 25\% < 50\%$
- $< 25\%$

**NOTES**

1. This map is intended to provide a strategic over-view of susceptibility to groundwater flooding and should not be used to assess flood risk for individual properties.
2. Absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence.

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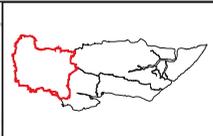
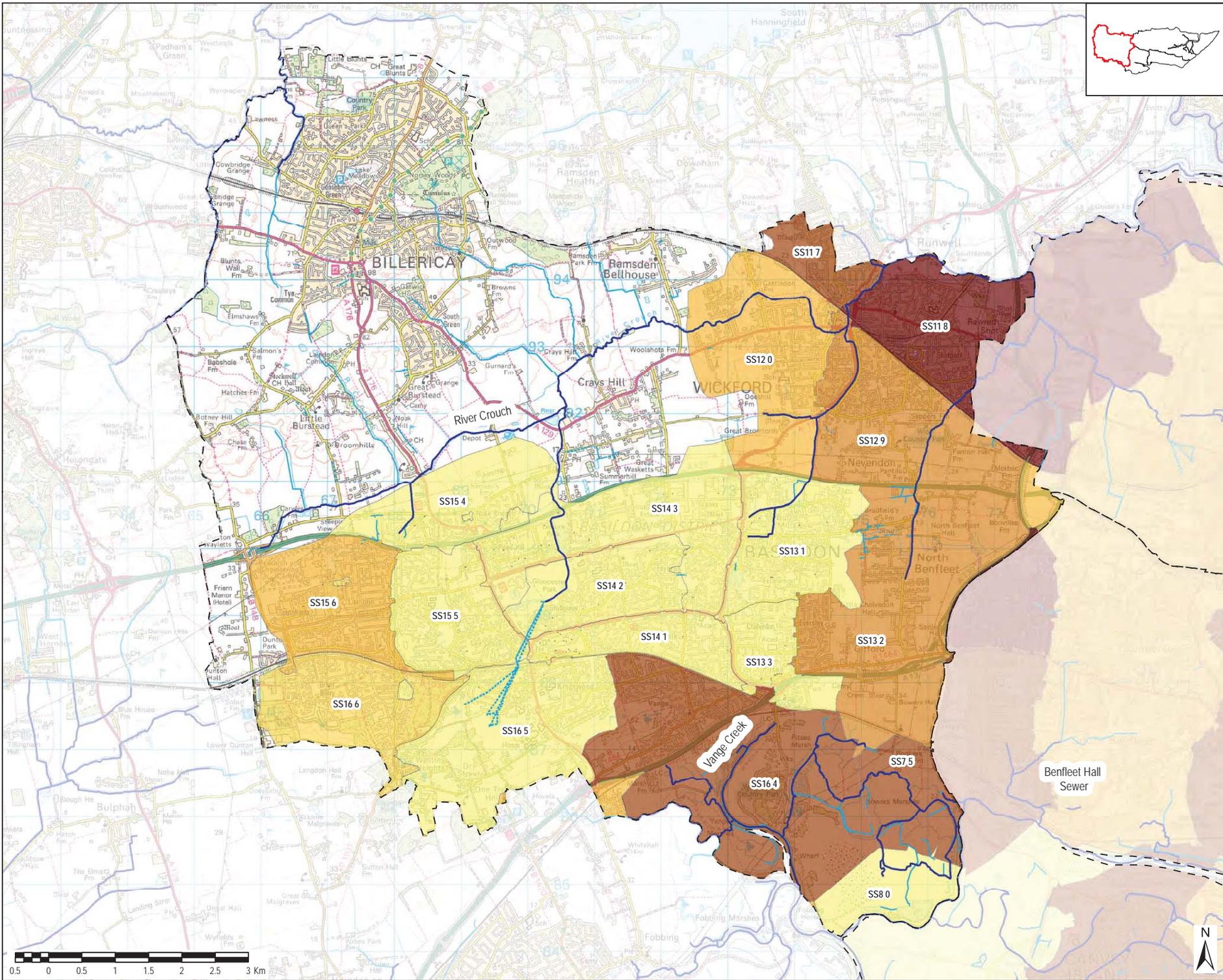
Drawing Title: **AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING**

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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**DG5: Flooding Incidents by Postcode**

- 0
- 1
- 2-3
- 4-5
- 6-10
- 11-30

**NOTES**

1. This map is intended to provide a strategic overview of historic sewer flooding and should not be used to assess flood risk for individual properties.

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Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **SEWER FLOODING**

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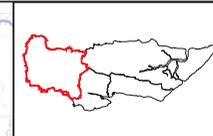
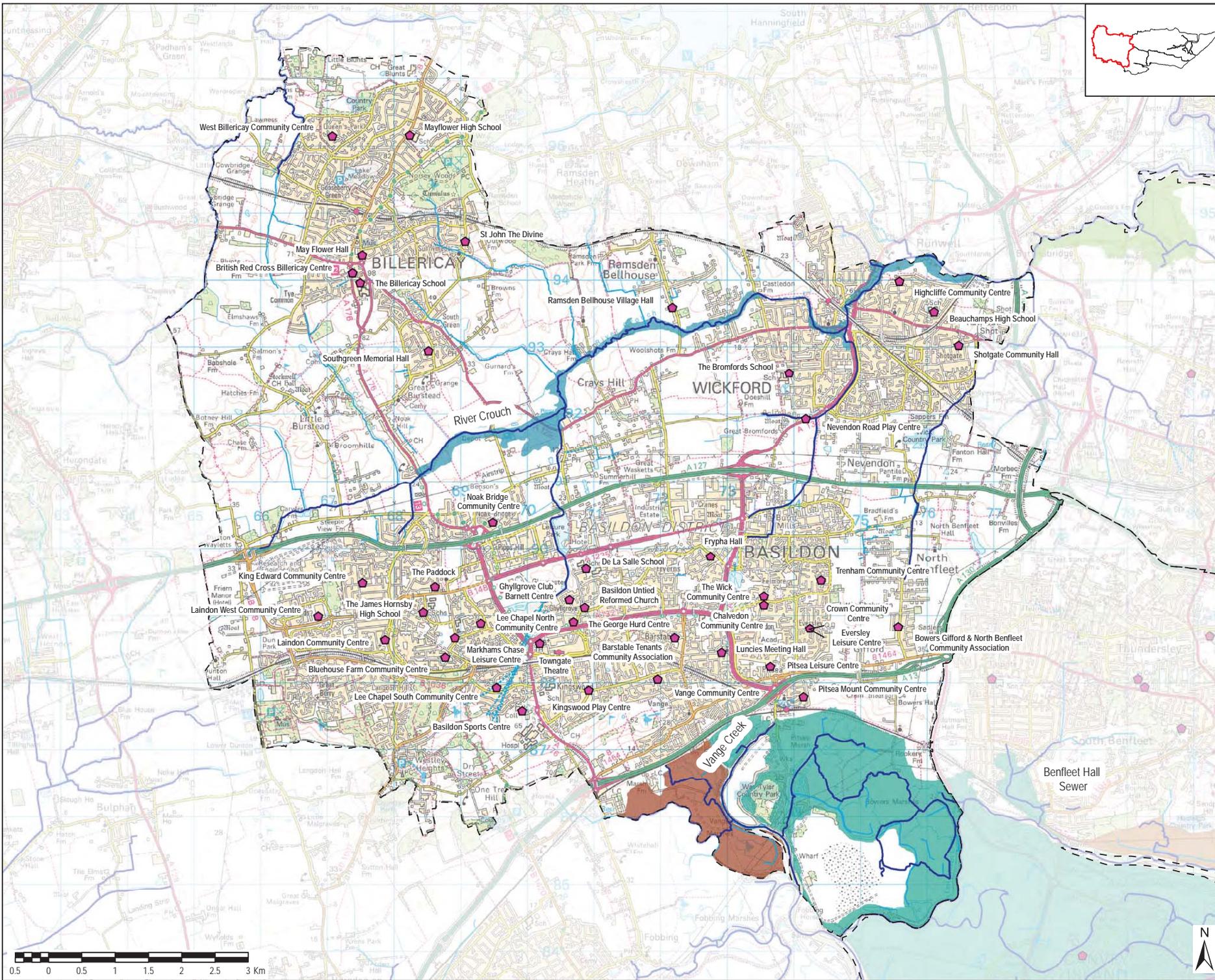
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File Name: \\na-003\700 - Water\Water New4 - PROJECTS\5653\46532482 - South Essex SFRA\Map GIS\Project Files\MS\Drawings\4.6.5.6.6.7.6-Flood Warning Areas.mxd



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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Emergency Rest Centre
- Flood Warning Area**
- Canvey Island North
  - Canvey Island South
  - Leigh On Sea frontage from Chalkwell to Hadleigh Marshes including Two tree Island
  - River Crouch from Noak Bridge to Runwell, including Wickford
  - Shellhaven to Grays including Tilbury
  - Tidal River Crouch from Creeksea to Battlesbridge

- NOTES**
- The Environment Agency provides a free flood warning service for many areas at risk of flooding from rivers and sea. This can provide advance notice of flooding and provide time to prepare.
  - The Environment Agency issues flood warnings to homes and businesses when flooding is expected. Upon receipt of a warning, residents should take immediate action.
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Drawing Title: **FLOOD WARNING AREAS**

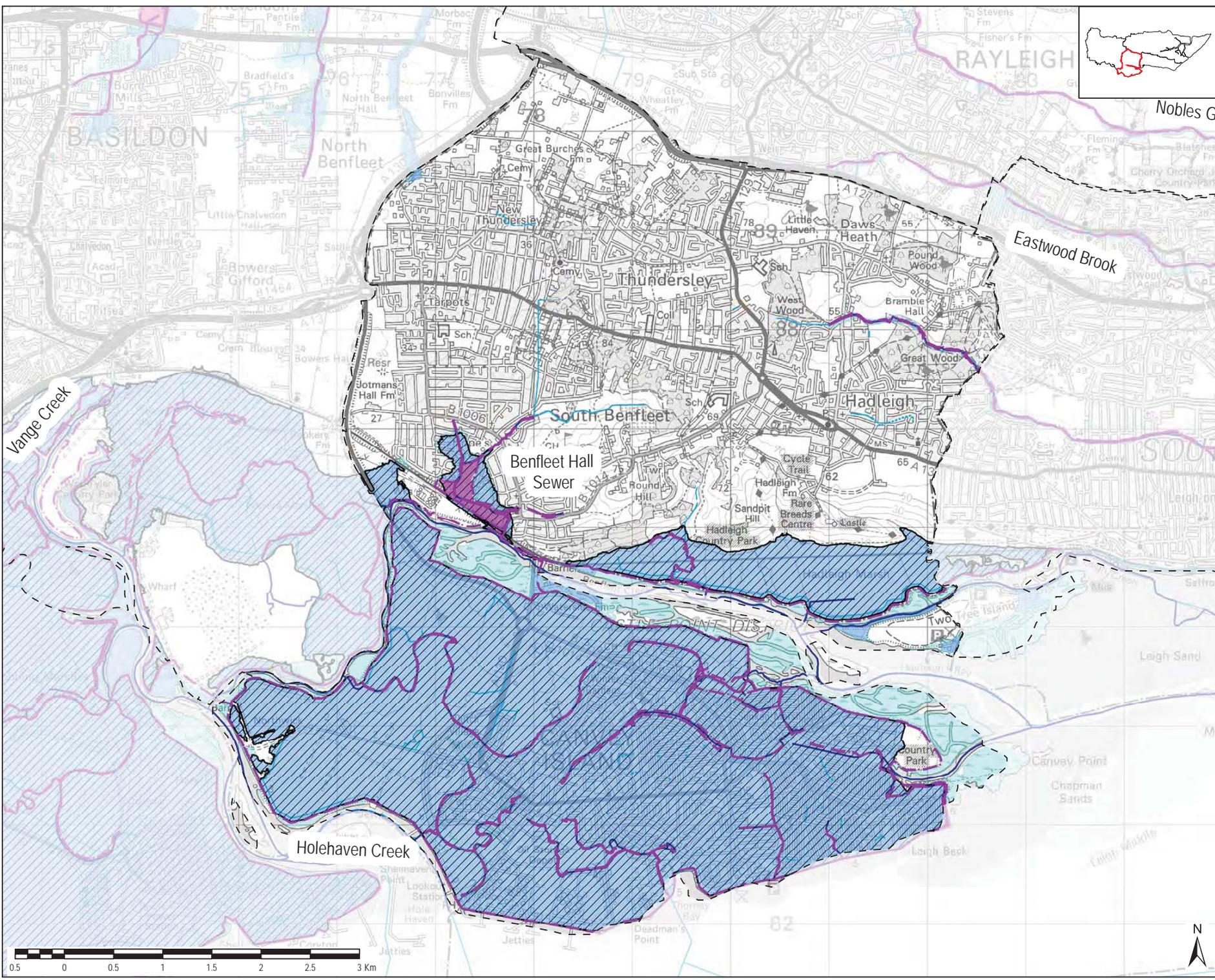
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Drawing Number: **FIGURE 4.6** Rev: **1**





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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Flood Defence (AIMS)
- Area Benefiting from Flood Defence
- Flood Storage Area
- Flood Zone 2 (0.1 AEP)
- Flood Zone 3 (1% AEP fluvial, and 0.5% AEP tidal)
- Flood Zone 3b (5% AEP)

**NOTES**

1. Flood Zone 2 and Flood Zone 3 are taken from the Environment Agency's Flood Map for Planning. This Environment Agency Flood Zone data defines the extent of flooding from rivers and the sea without considering the presence of flood defences. The reason for this approach is to make an allowance for the residual flood risk in the event of a failure or breaching/topping of the flood defences. This approach raises the awareness of flood risk in defended areas and helps to ensure that this is not discounted as part of development, but is managed approximately.

2. Flood Zone 3b is defined using modelled extents for the 5% AEP fluvial event where modelled data was available.

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Purpose of Issue: **FINAL**

Client:

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **FLUVIAL AND TIDAL FLOOD ZONES**

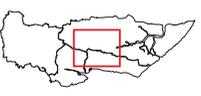
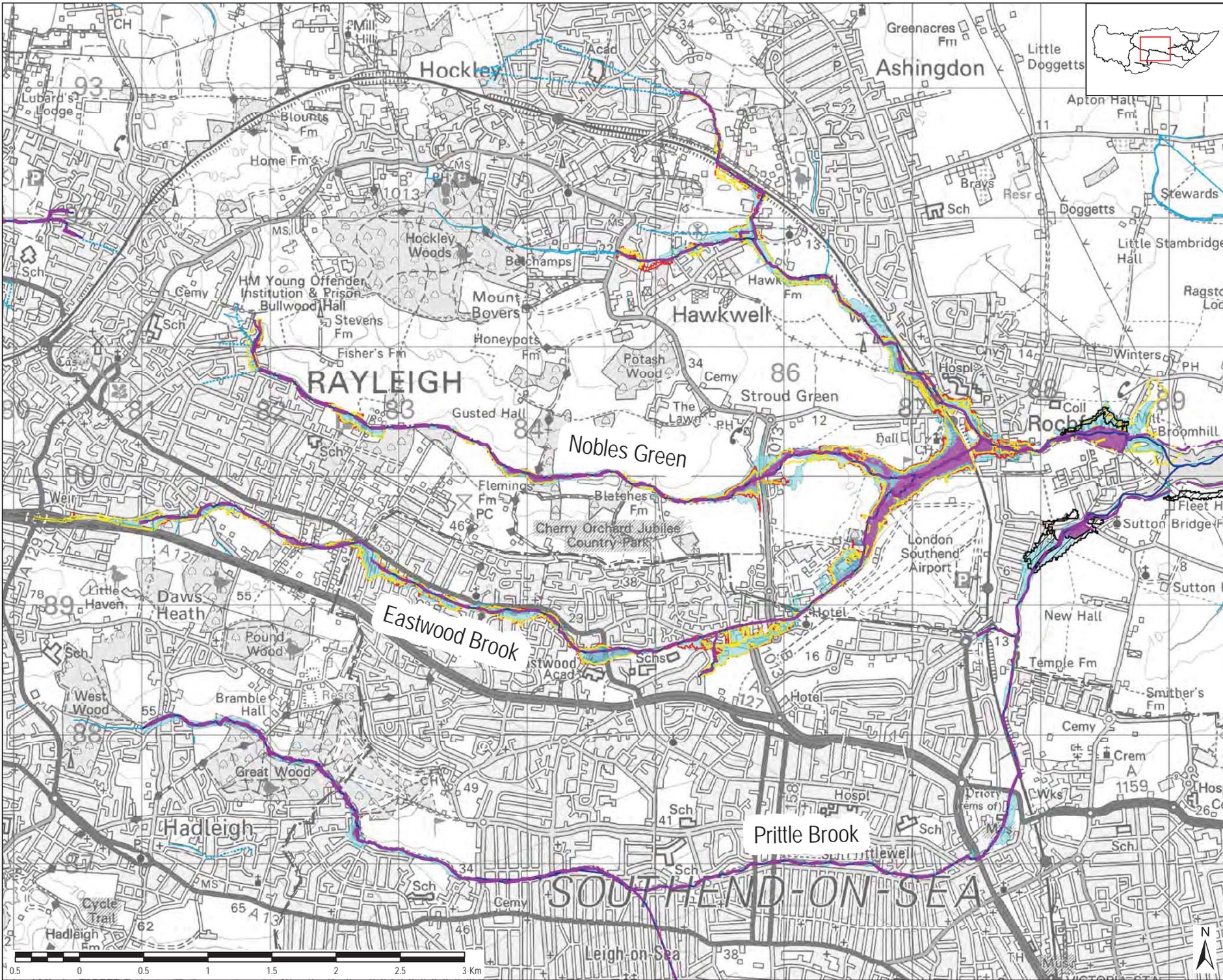
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File Name: \\ba-wp-0031-0700 - Water\Water New4 - PROJECT\5605316\60532482 - South Essex SFRA\GIS\Project Files\MXDs\Figure 4.1.5.16.1.1.1 Fluvial and Tidal Flood Zones.mxd

File Name: \\ba-wp-003-0700 - Water\Water New4 - PROJECT: S60516\6532482 - South Essex CFPA\GIS\Project Files\WQCS\Figures 5 to Upper River Roach and Tributaries Modelled Outlines Including Climate Change.mxd



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### LEGEND

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Flood Defence (AIMS)
- Area Benefiting from Flood Defence
- Flood Zone - Climate Change 1% AEP + 25%
- Flood Zone - Climate Change 1% AEP + 35%
- Flood Zone - Climate Change 1% AEP + 65%
- Modelled 0.1% AEP Outline
- Modelled 1% AEP Outline
- Modelled 5% AEP Outline

### NOTES

Hydraulic modelling of flooding from the River Roach defines the extent of flooding during a 0.1% AEP, 1% AEP and 5% AEP flood event. The modelling considers the presence of flood defences.

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Drawing Title:  
**UPPER RIVER ROACH AND TRIBUTARIES MODELLED OUTLINES INCLUDING CLIMATE CHANGE**

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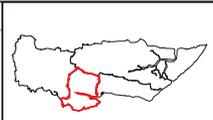
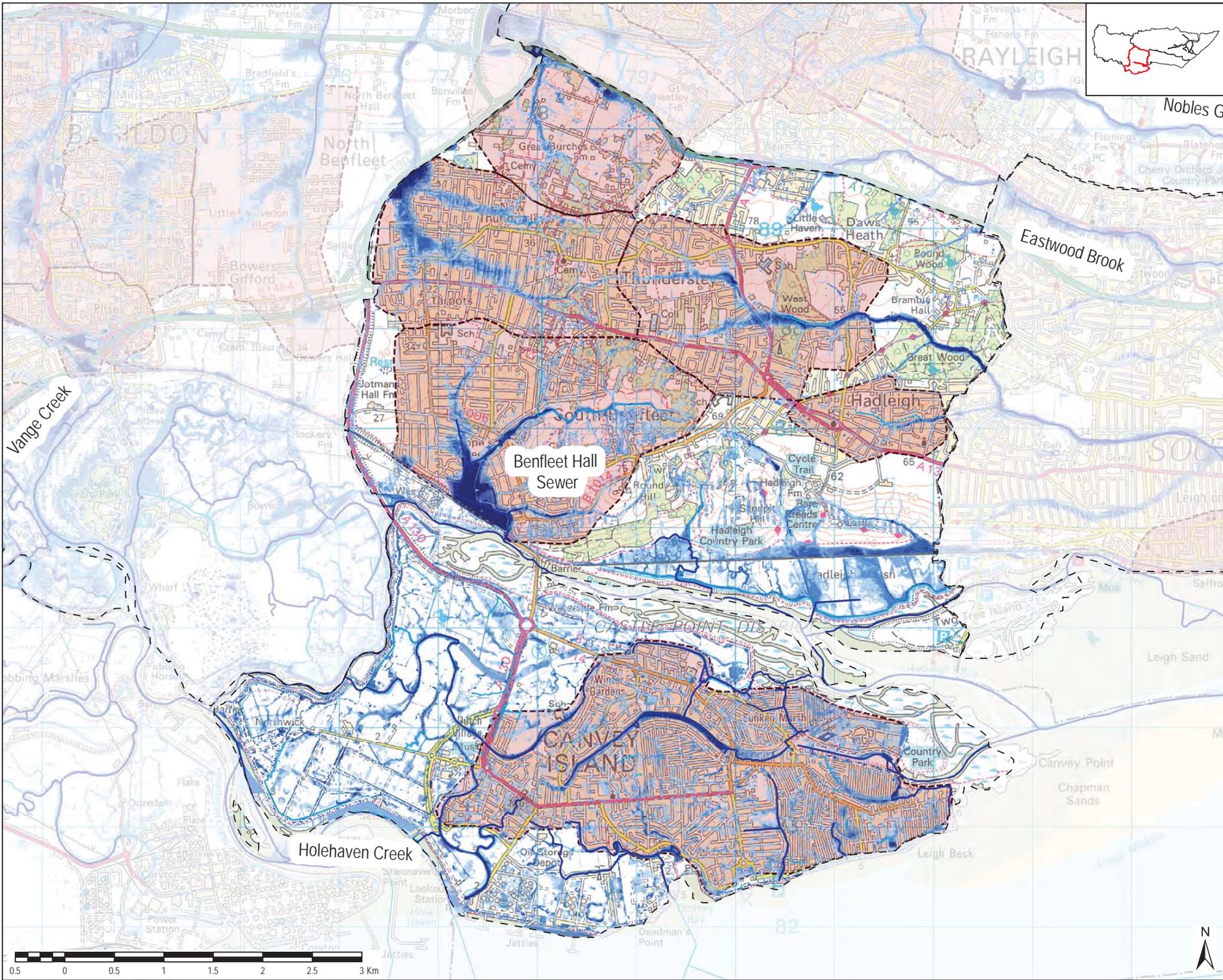
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File Name: \\ba-wp-0031700 - Water\Water\New4 - PROJECT: S60316\6532482 - South Essex SFRA\Map\GIS\Project Files\MXD\Figure 4-2.3.2.6.7.2 Risk of Flooding from Surface Water.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Area of Critical Drainage
- 1 in 30 year (3.3% annual probability)
- 1 in 100 year (1% annual probability)
- 1 in 1000 year (0.1% annual probability)

**NOTES**

- This map shows the predicted likelihood of surface water flooding based on the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
- The Risk from Surface Water Flooding is divided into three categories:
  - Low: each year the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%)
  - Medium: each year the chance of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%)
  - High: each year, the chance of flooding is equal to or greater than 1 in 30 (3.3%)
- The potential impact of surface water flooding can vary according to the depth of water and velocity (speed and direction of flow).
- Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
- This map is intended to provide strategic overview of susceptibility to surface water flooding and should not be used to assess flood risk for individual properties.
- Area of Critical Drainage are based upon the Local Flood Risk Management Strategy.

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Client

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Drawing Title: **RISK OF FLOODING FROM SURFACE WATER**

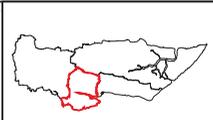
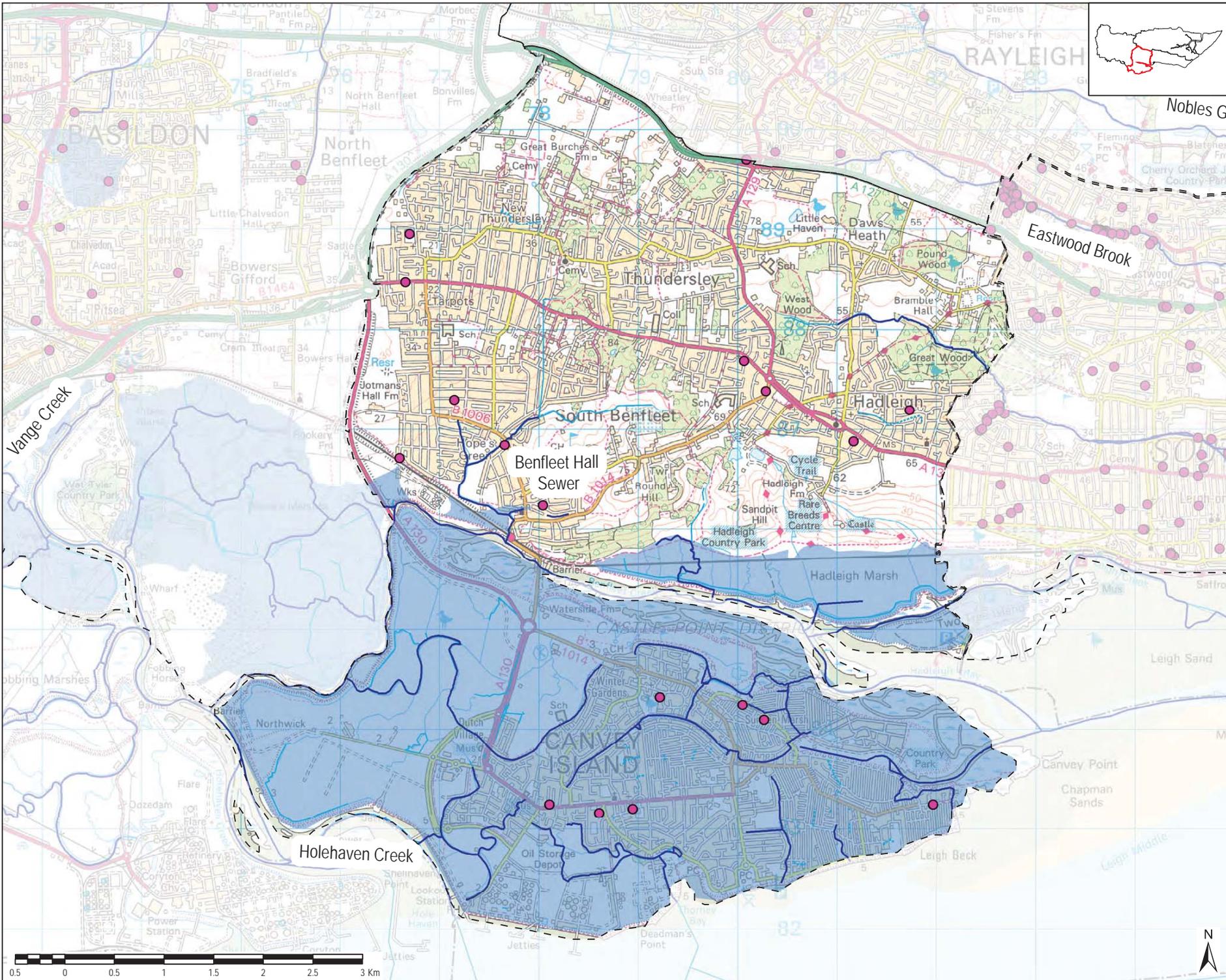
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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Historic Flood Map
- Record of Flooding (Unknown Source)

**NOTES**

1. Flood records do not refer to internal property flooding, rather area that have been susceptible to flooding in the past. Further detail is included in Appendix A of this report.

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Drawing Title: **HISTORIC FLOOD MAP**

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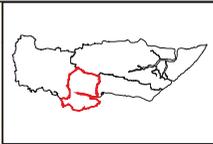
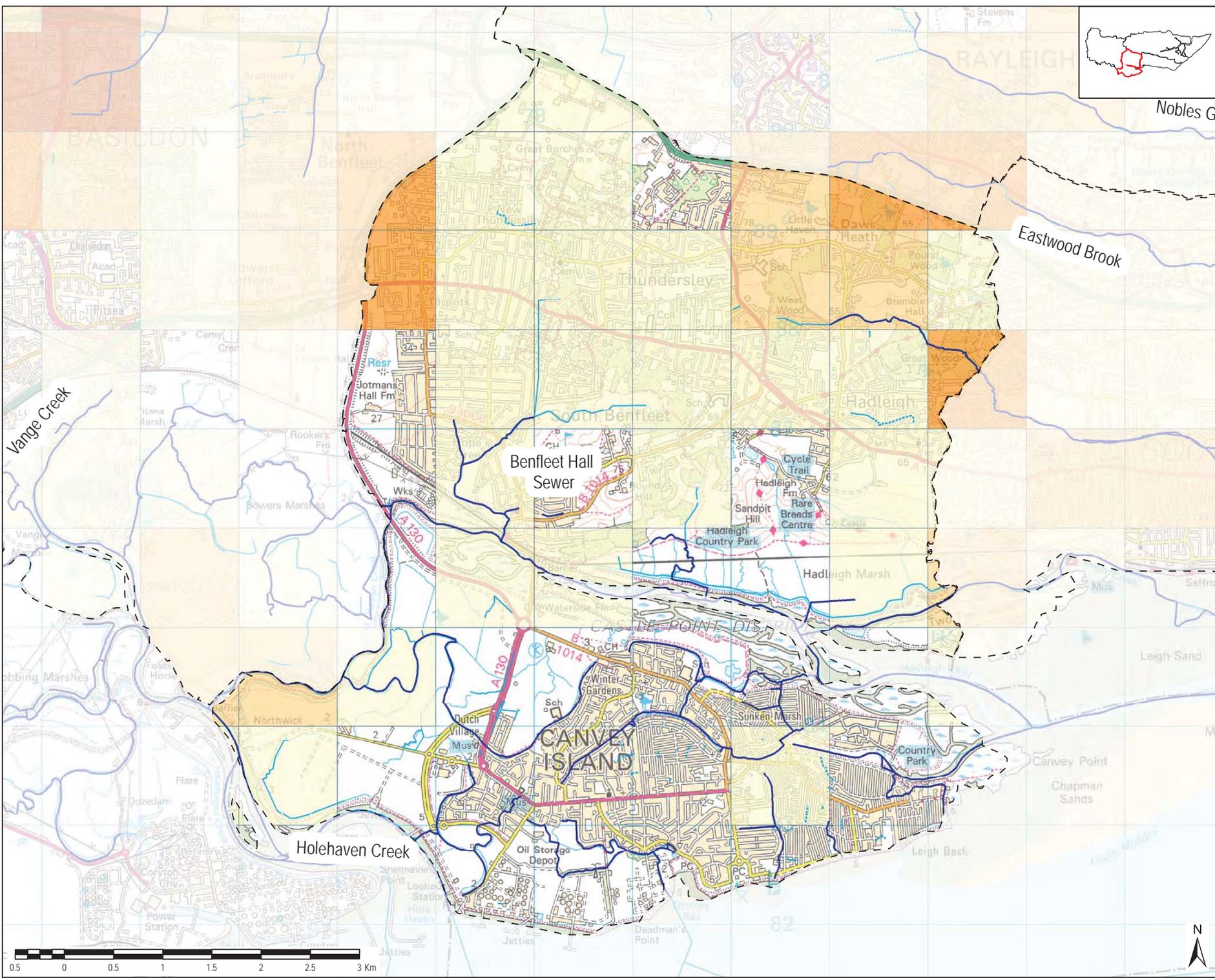


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File Name: \\ba-np-003\700 - Water\Water New4 - PROJECT\S063\0632482 - South Essex SFRA\MD GIS\Project\Files\MS\063\Fig04-4.5.4.6.1.7-Areas Susceptible to Ground Water Flooding.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**Areas Susceptible to Groundwater Flooding - Level of Risk**

- $\geq 75\%$
- $\geq 50\% < 75\%$
- $\geq 25\% < 50\%$
- $< 25\%$

**NOTES**

- This map is intended to provide a strategic over-view of susceptibility to groundwater flooding and should not be used to assess flood risk for individual properties.
- Absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence.

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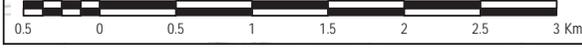
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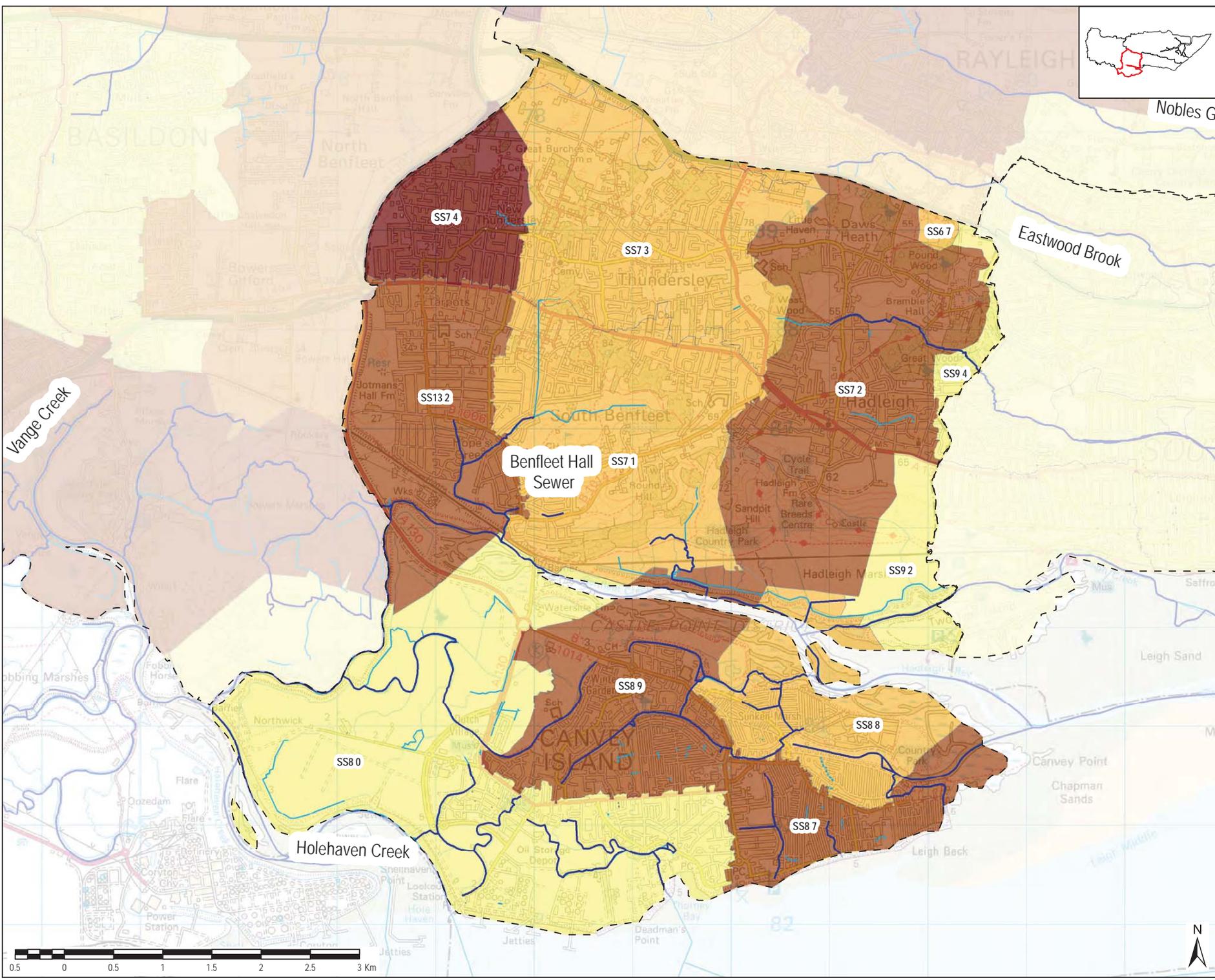
**AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING**

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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**DG5: Flooding Incidents by Postcode**

- 0
- 1
- 2-3
- 4-5
- 6-10
- 11-30

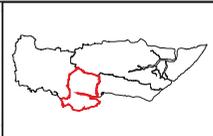
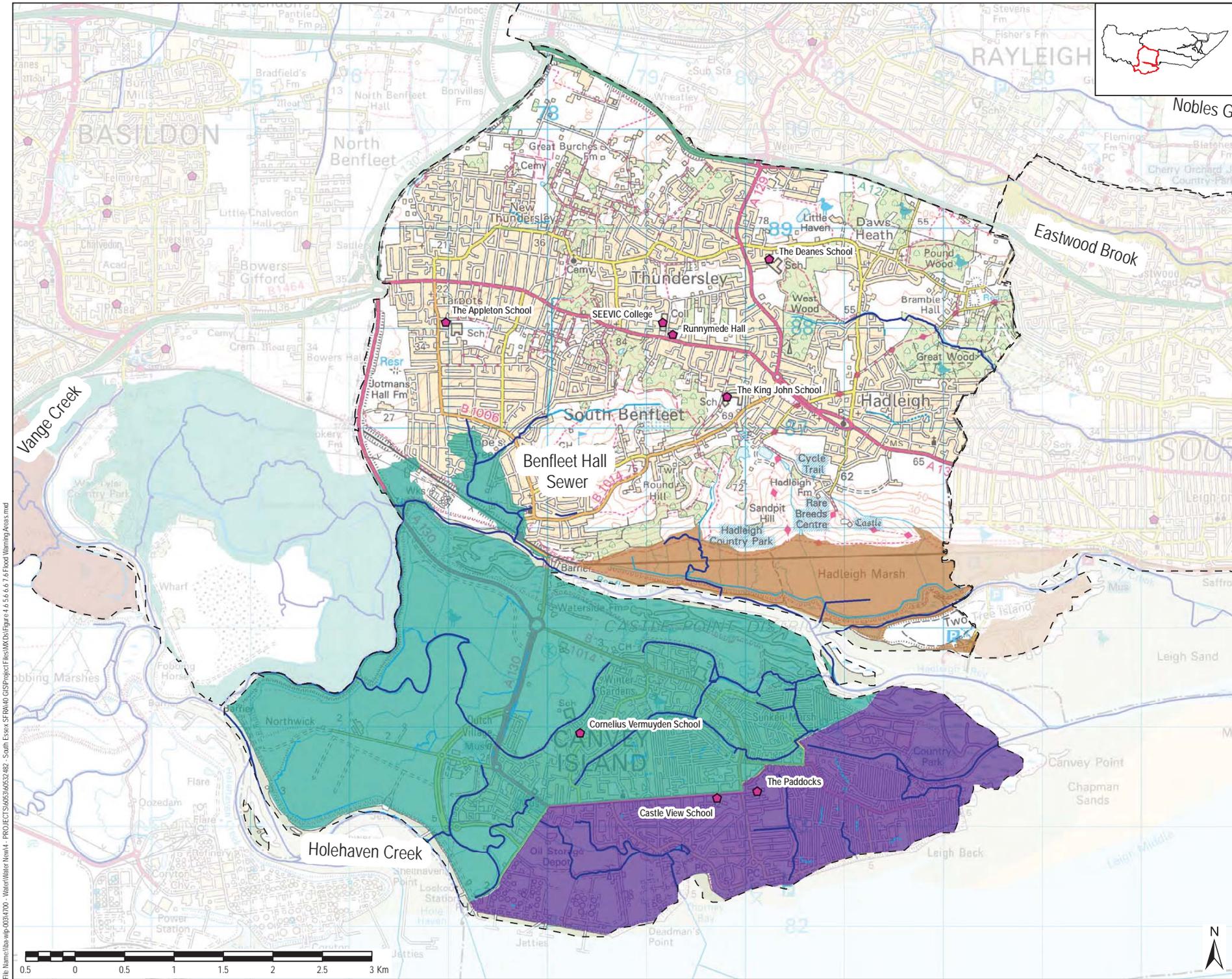
**NOTES**

1. This map is intended to provide a strategic overview of historic sewer flooding and should not be used to assess flood risk for individual properties.

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Project Title	SOUTH ESSEX LEVEL 1 SFRA		
Drawing Title	SEWER FLOODING		
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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Emergency Rest Centre
- Flood Warning Area**
- Canvey Island North
  - Canvey Island South
  - Eastwood Brook from downstream of Rayleigh Weir and the Pittwell Brook to Southend Airport
  - Leigh On Sea frontage from Chalkwell to Hadleigh Marshes including Two tree Island
  - River Crouch from Noak Bridge to Runwell, including Wickford
  - Shellhaven to Grays including Tilbury

**NOTES**

- The Environment Agency provides a free flood warning service for many areas at risk of flooding from rivers and sea. This can provide advance notice of flooding and provide time to prepare.
- The Environment Agency issues flood warnings to homes and businesses when flooding is expected. Upon receipt of a warning, residents should take immediate action.

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Drawing Title: **FLOOD WARNING AREAS**

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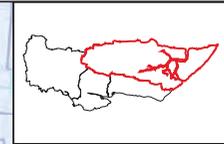
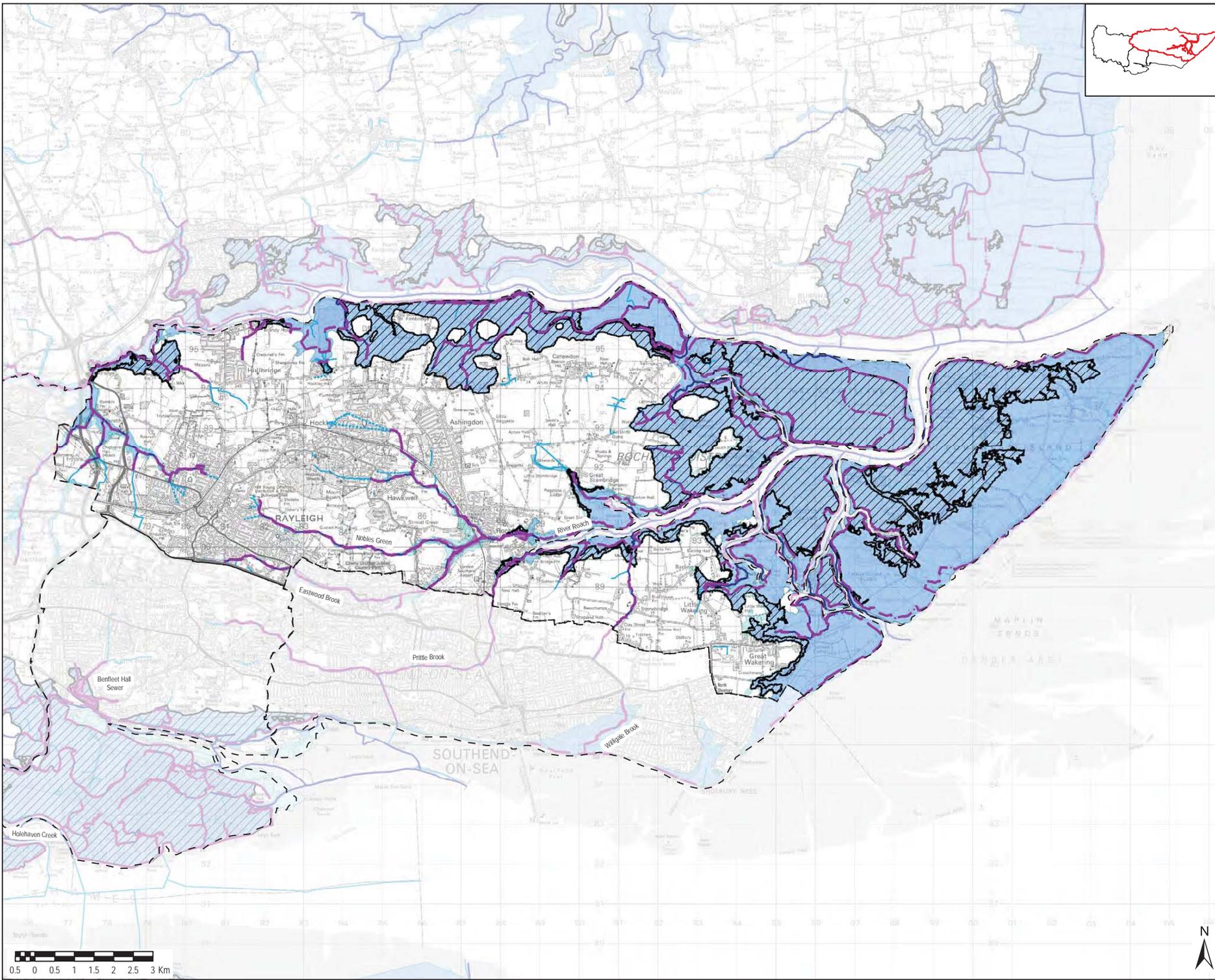
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File Name: \\ba-wp-003\700 - Water\Water New4 - PROJECT\5605316\6532482 - South Essex SFRA\Map\GIS\Project Files\MXDs\Figure 41.5.16.1.1.1 Fluvial and Tidal Flood Zones.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Flood Defence (AIMS)
- Area Benefiting from Flood Defence
- Flood Storage Area
- Flood Zone 2 (0.1 AEP)
- Flood Zone 3 (1% AEP fluvial, and 0.5% AEP tidal)
- Flood Zone 3b (5% AEP)

**NOTES**

1. Flood Zone 2 and Flood Zone 3 are taken from the Environment Agency's Flood Map for Planning. This Environment Agency Flood Zone data defines the extent of flooding from rivers and the sea without considering the presence of flood defences. The reason for this approach is to make an allowance for the residual flood risk in the event of a failure or breach/over-topping of the flood defences. This approach raises the awareness of flood risk in defended areas and helps to ensure that this is not discounted as part of development, but is managed approximately.

2. Flood Zone 3b is defined using modelled extents for the 5% AEP fluvial event where modelled data was available.

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Drawing Title: **FLUVIAL AND TIDAL FLOOD ZONES**

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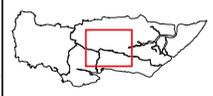
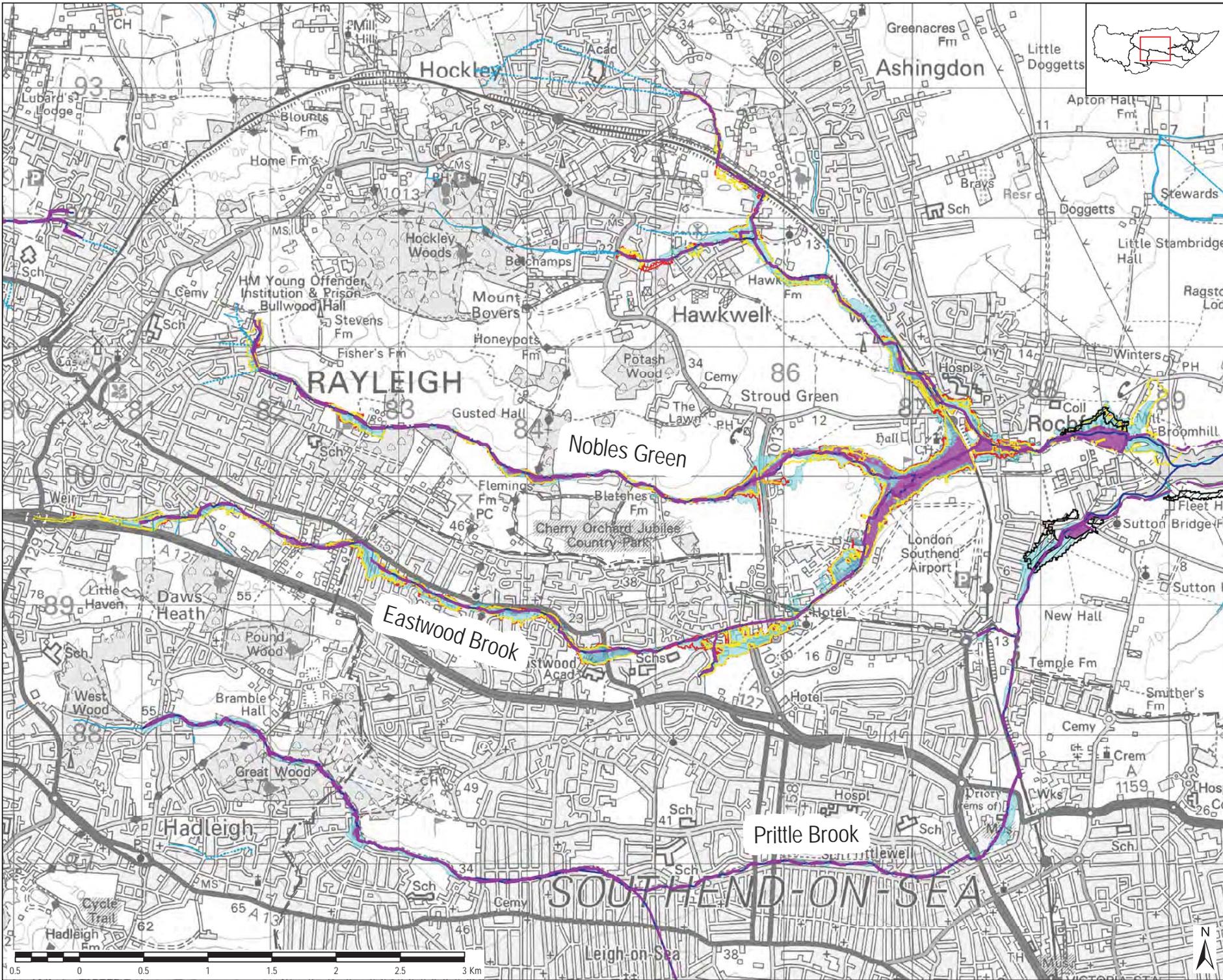
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### LEGEND

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Flood Defence (AIMS)
- Area Benefiting from Flood Defence
- Flood Zone - Climate Change 1% AEP + 25%
- Flood Zone - Climate Change 1% AEP + 35%
- Flood Zone - Climate Change 1% AEP + 65%

River Roach and its tributaries modelled outlines

- Modelled 0.1% AEP Outline
- Modelled 1% AEP Outline
- Modelled 5% AEP Outline

### NOTES

Hydraulic modelling of flooding from the River Roach defines the extent of flooding during a 0.1% AEP, 1% AEP and 5% AEP flood event. The modelling considers the presence of flood defences.

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Drawing Title:  
**UPPER RIVER ROACH AND TRIBUTARIES MODELLED OUTLINES INCLUDING CLIMATE CHANGE**

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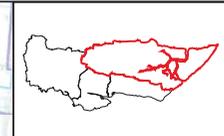
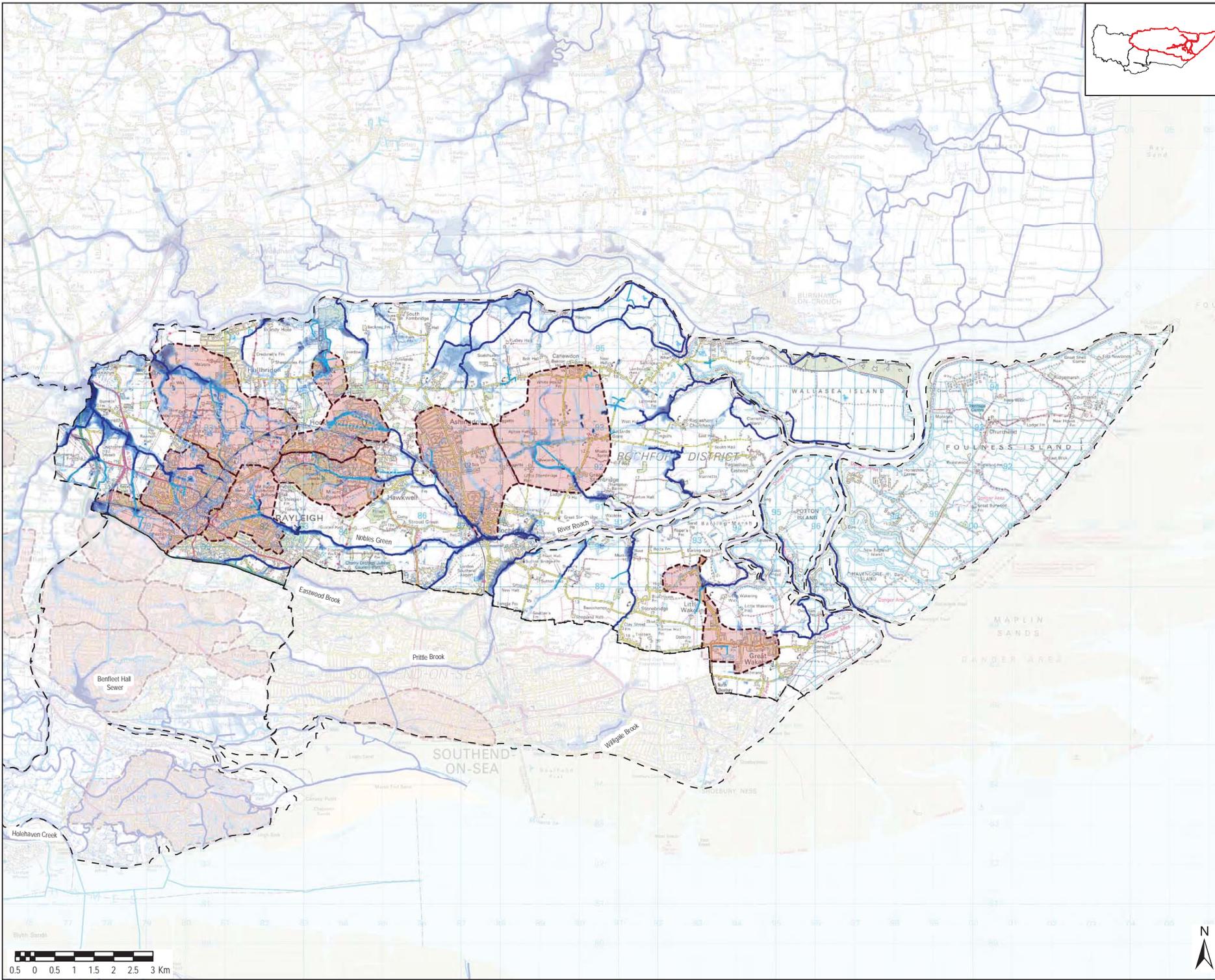
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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Area of Critical Drainage
  - 1 in 30 year (3.3% annual probability)
  - 1 in 100 year (1% annual probability)
  - 1 in 1000 year (0.1% annual probability)

**NOTES**

1. This map shows the predicted likelihood of surface water flooding based on the Environment Agency's updated Flood Map from Surface Water data, which may be subject to further analysis in the future.
2. The Risk from Surface Water Flooding is divided into three categories:
  - Low: each year the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%)
  - Medium: each year the chance of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%)
  - High: each year, the chance of flooding is equal to or greater than 1 in 30 (3.3%)
3. The potential impact of surface water flooding can vary according to the depth of water and velocity (speed and direction of flow).
4. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
5. This map is intended to provide strategic overview of susceptibility to surface water flooding and should not be used to assess flood risk for individual properties.
6. Area of Critical Drainage are based upon the Local Flood Risk Management Strategy.

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Client

Project Title  
**SOUTH ESSEX LEVEL 1 SFRA**

**RISK OF FLOODING FROM SURFACE WATER**

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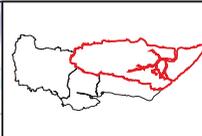
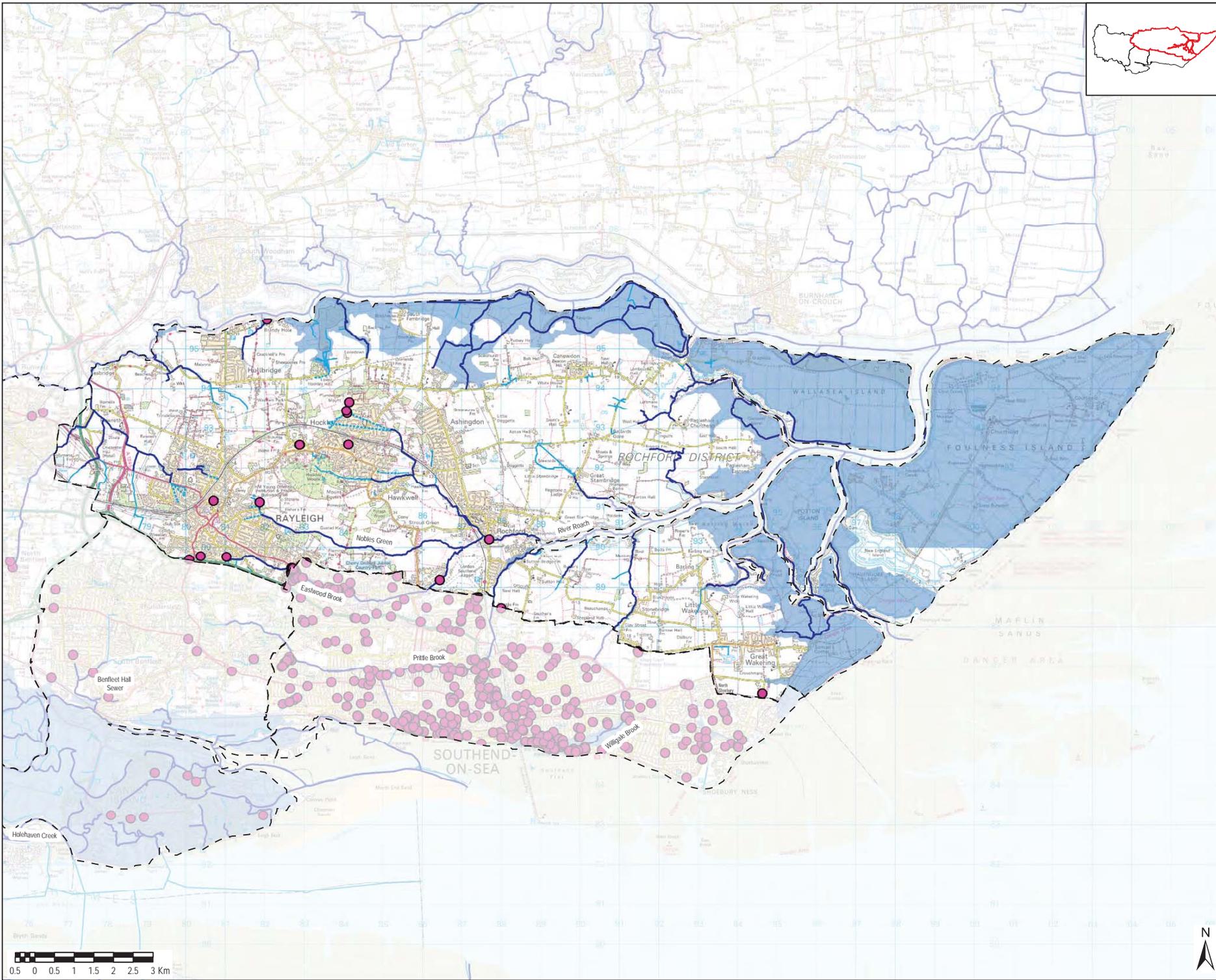
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Drawing Number: **FIGURE 6.2** Rev: **1**



File Name: Iba-wp-00317700 - Water Water Now4 - PROJECTS\6576652482 - South Essex SFRA\40 GIS\Project Files\MXD\Figure 4.3.1a.3.1.3 Historic Flood Map.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Historic Flood Map
- Record of Flooding (Unknown Source)

**NOTES**

1. Flood records do not refer to internal property flooding, rather area that have been susceptible to flooding in the past. Further detail is included in Appendix A of this report.

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Purpose of Issue: **FINAL**

Client:

Project Title:  
**SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title:  
**HISTORIC FLOOD MAP**

Drawn KLD	Checked JW	Approved CP	Date 12/04/2018
AECOM Internal Project No. 60532482		Scale @ A3 1:88,000	

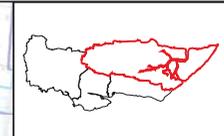
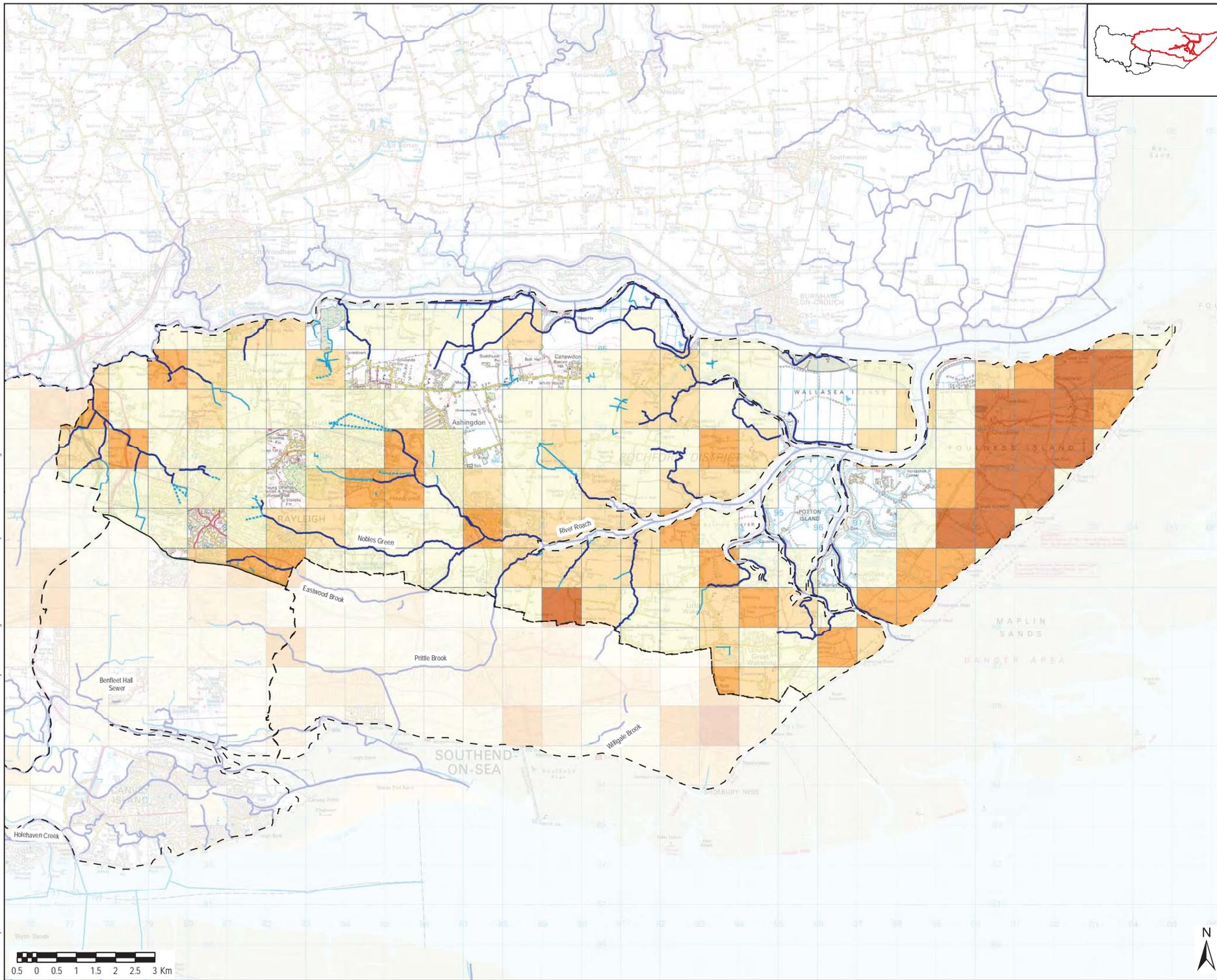
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Drawing Number: **FIGURE 6.3**      Rev: **1**



File Name: \\ba-wp-003\700 - Water\Water New4 - PROJECT\S653\6532482 - South Essex SFRA\Map\GIS\Project\Files\MS\Ds\Figures\4.5.4.6.4.7.4 - Areas Susceptible to Ground Water Flooding.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**Areas Susceptible to Groundwater Flooding - Level of Risk**

- $\geq 75\%$
- $\geq 50\% < 75\%$
- $\geq 25\% < 50\%$
- $< 25\%$

**NOTES**

- This map is intended to provide a strategic over-view of susceptibility to groundwater flooding and should not be used to assess flood risk for individual properties.
- Absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence.

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Client:

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING**

Drawn KLD	Checked JW	Approved CP	Date 11/04/2018
AECOM Internal Project No. 60532482		Scale @ A3 1:88,000	

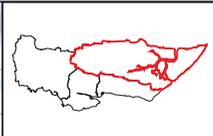
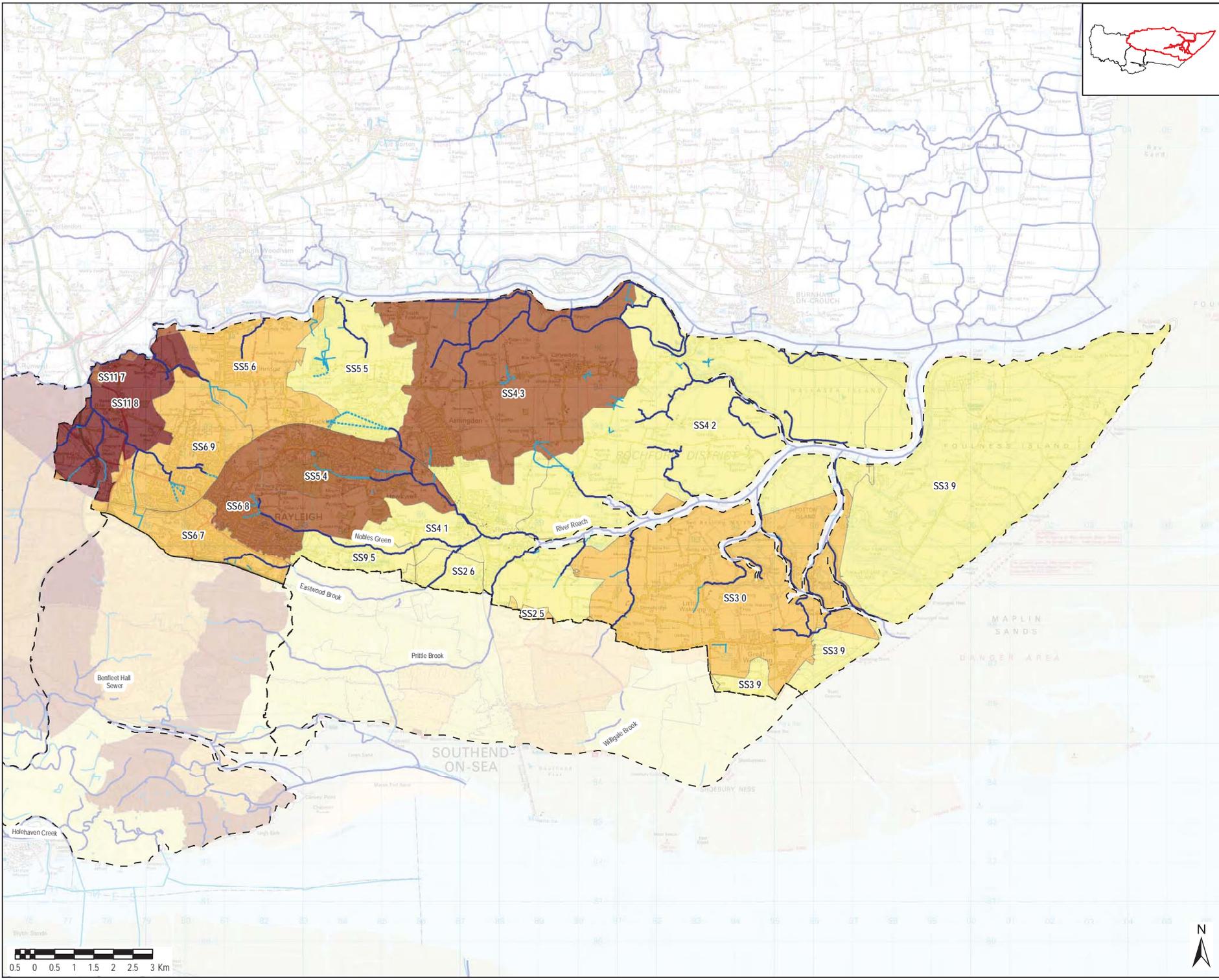
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Drawing Number: **FIGURE 6.4** Rev: **1**



File Name: \\ba-wp-003\700 - Water\Water New4 - PROJECT\S65316532482 - South Essex SFRA\Map\GISProjectFiles\MS\Do\Figures\5.5.5.6.5.7.5 Sewer Flooding.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**DG5: Flooding Incidents by Postcode**

- 0
- 1
- 2 - 3
- 4 - 5
- 6 - 10
- 11 - 30

**NOTES**

1. This map is intended to provide a strategic overview of historic sewer flooding and should not be used to assess flood risk for individual properties.

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Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

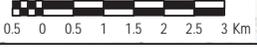
Drawing Title: **SEWER FLOODING**

Drawn KLD	Checked JW	Approved CP	Date 11/04/2018
AECOM Internal Project No. 60532482		Scale @ A3 1:88,000	

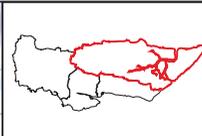
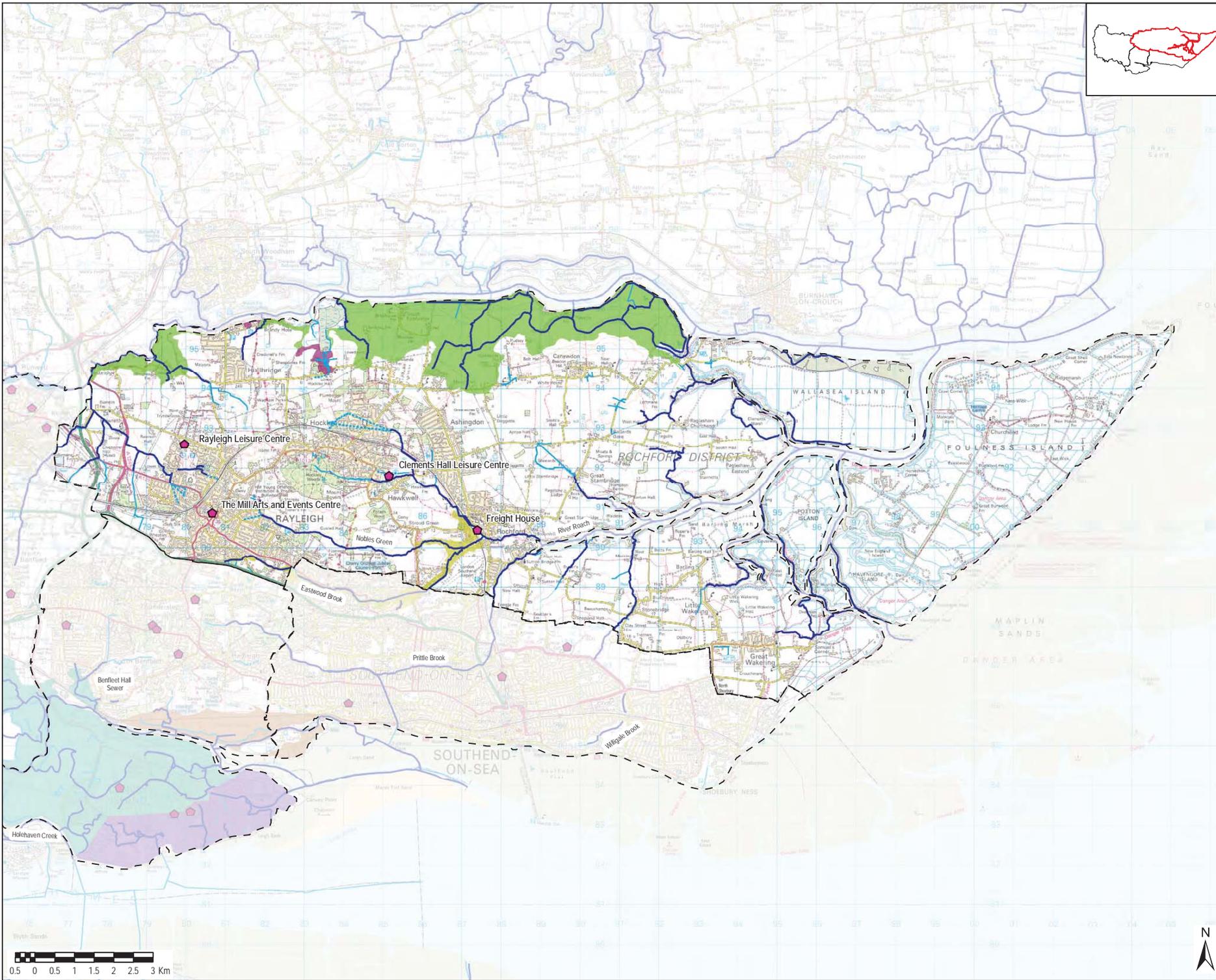
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Drawing Number: **FIGURE 6.5** Rev: **1**



File Name: \\ba-wp-003\700 - Water\Water New4 - PROJECT\56532482 - South Essex SFRA\Map GIS\Project Files\Map\Figures\4.6.5.6.6.7.6-Flood Warning Areas.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- ◆ Emergency Rest Centre

**Flood Warning Area**

- Canvey Island North
- Canvey Island South
- Eastwood Brook from downstream of Rayleigh Weir and the Pittlewell Brook to Southend Airport
- Hullbridge waterside properties
- Leigh On Sea frontage from Chalkwell to Hadleigh Marshes including Two tree Island
- River Crouch from Noak Bridge to Runwell, including Wickford
- Shellhaven to Grays including Tilbury
- Tidal River Crouch from Creeksea to Battlesbridge

**NOTES**

- The Environment Agency provides a free flood warning service for many areas at risk of flooding from rivers and sea. This can provide advance notice of flooding and provide time to prepare.
- The Environment Agency issues flood warnings to homes and businesses when flooding is expected. Upon receipt of a warning, residents should take immediate action.

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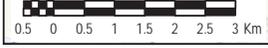
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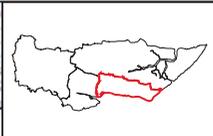
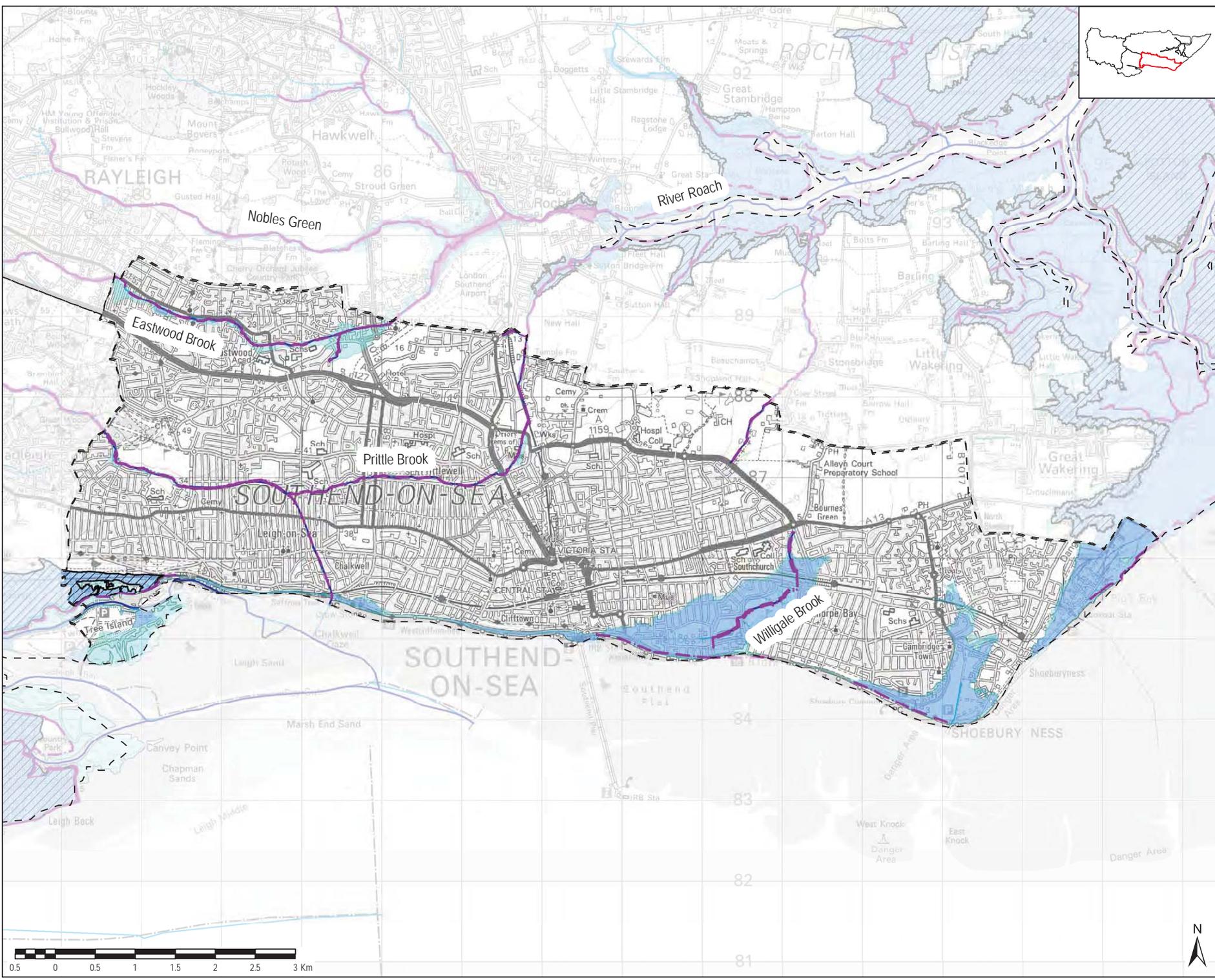
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Drawing Number: **FIGURE 6.6** Rev: **1**





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- LEGEND**
- - - Council Boundary
  - Main River
  - Ordinary Watercourse
  - ..... Culvert
  - Flood Defence (AIMS)
  - ▨ Area Benefiting from Flood Defence
  - ▨ Flood Storage Area
  - Light Blue Flood Zone 2 (0.1 AEP)
  - Medium Blue Flood Zone 3 (1% AEP fluvial, and 0.5% AEP tidal)
  - Dark Blue Flood Zone 3b (5% AEP)

**NOTES**

1. Flood Zone 2 and Flood Zone 3 are taken from the Environment Agency's Flood Map for Planning. This Environment Agency Flood Zone data defines the extent of flooding from rivers and the sea without considering the presence of flood defences. The reason for this approach is to make an allowance for the residual flood risk in the event of a failure or breach/over-topping of the flood defences. This approach raises the awareness of flood risk in defended areas and helps to ensure that this is not discounted as part of development, but is managed approximately.

2. Flood Zone 3b is defined using modelled extents for the 5% AEP fluvial event where modelled data was available.

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Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **FLUVIAL AND TIDAL FLOOD ZONES**

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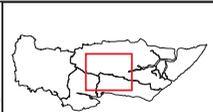
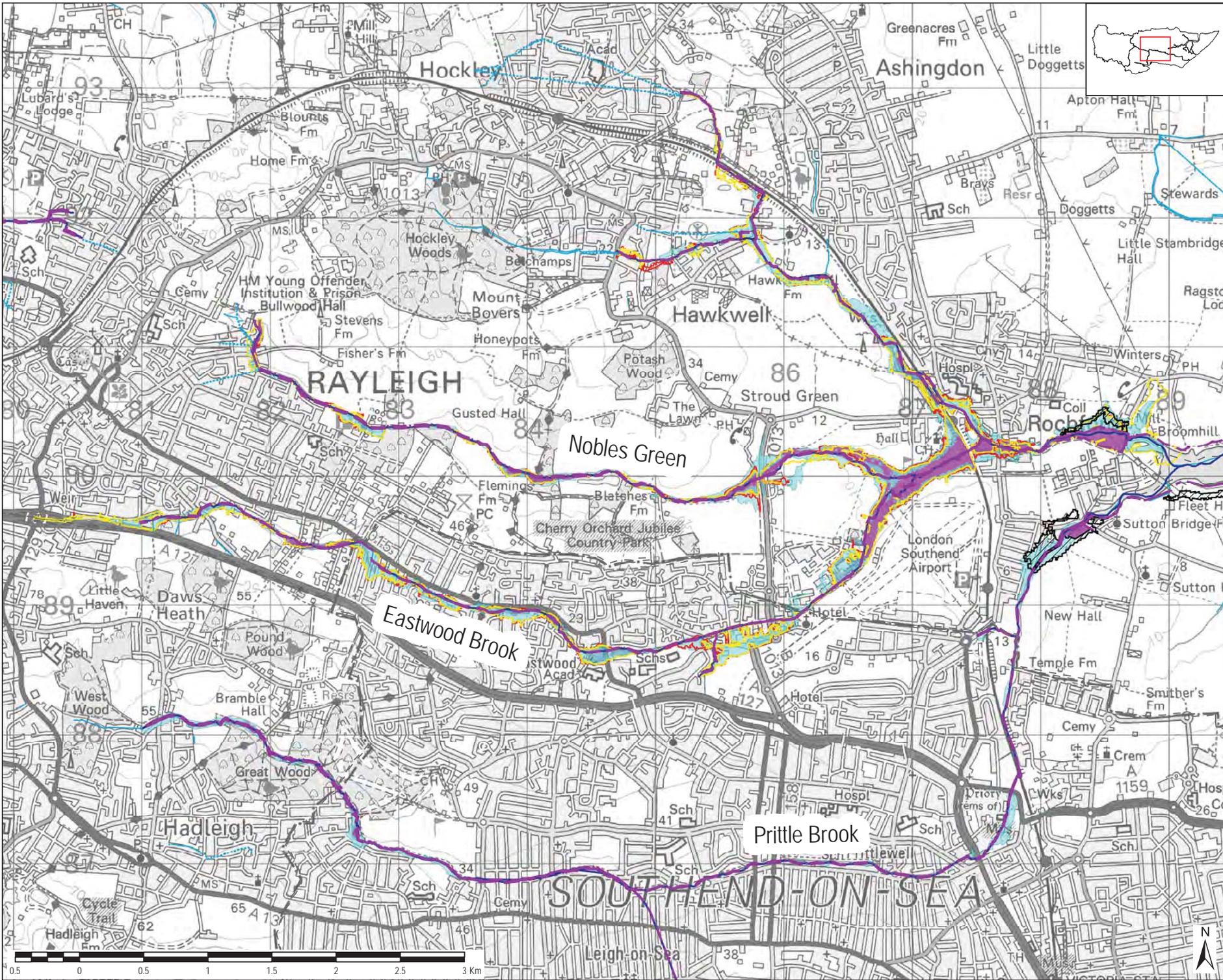
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Drawing Number: **FIGURE 7.1** Rev: **1**

File Name: lba-uk-0031-0700 - Water/Water New4 - PROJECT: S60532482 - South Essex SFRA/ACS/Project Files/MSDs/Figure 4.1.5.16.1.1.1: Fluvial and Tidal Flood Zones.mxd

File Name: \\ba-wp-003-0700 - Water\Water New4 - PROJECT: S60516\6532482 - South Essex CF\RA\GIS\Project Files\WQCS\Figure 7.1a Upper River Roach and Tributaries Modelled Outlines Including Climate Change.mxd



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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Flood Defence (AIMS)
  - Area Benefiting from Flood Defence
  - Flood Zone - Climate Change 1% AEP + 25%
  - Flood Zone - Climate Change 1% AEP + 35%
  - Flood Zone - Climate Change 1% AEP + 65%
- River Roach and its tributaries modelled outlines
- Modelled 0.1% AEP Outline
  - Modelled 1% AEP Outline
  - Modelled 5% AEP Outline

**NOTES**

Hydraulic modelling of flooding from the River Roach defines the extent of flooding during a 0.1% AEP, 1% AEP and 5% AEP flood event. The modelling considers the presence of flood defences.

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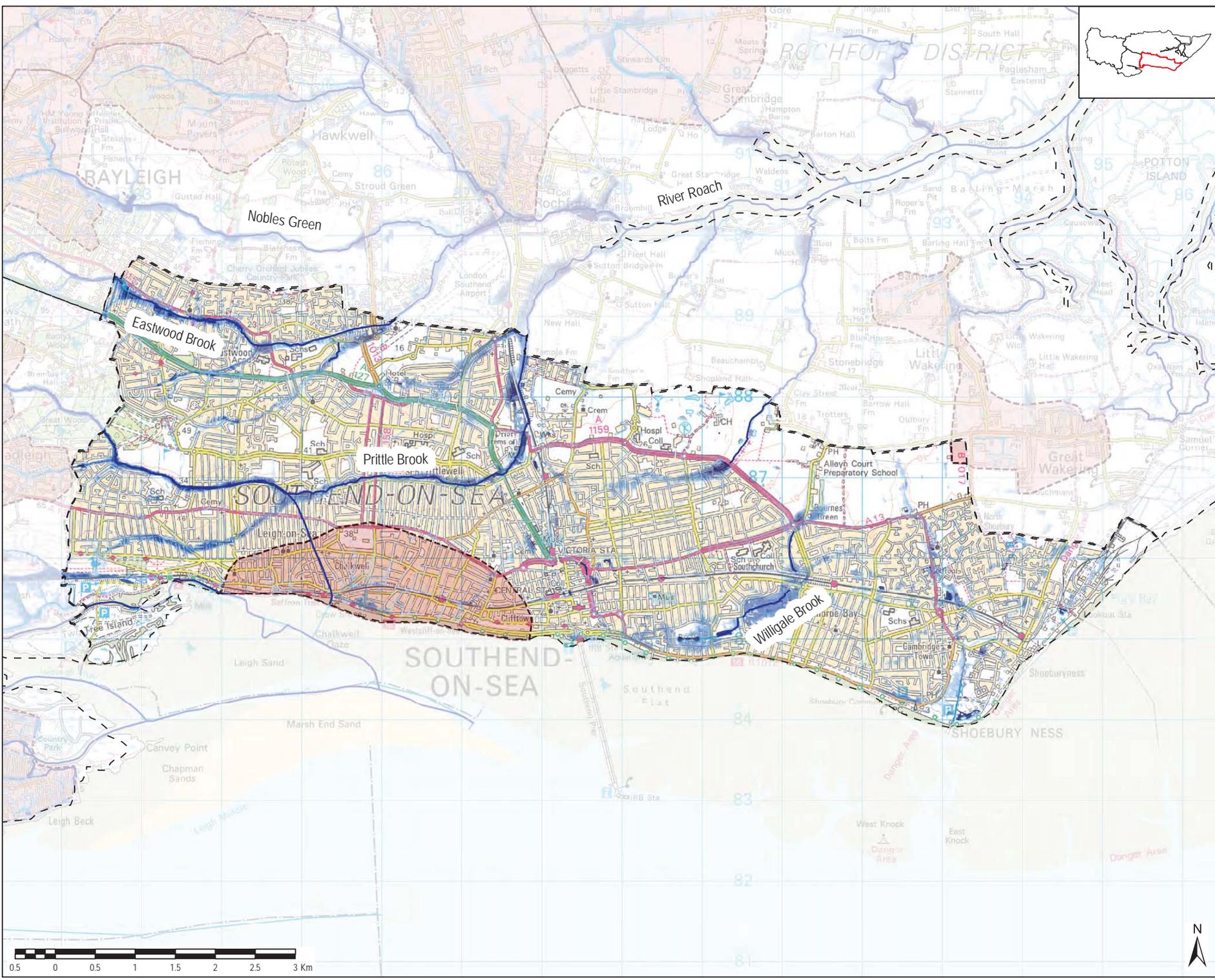
Drawing Title: **UPPER RIVER ROACH AND TRIBUTARIES MODELLED OUTLINES INCLUDING CLIMATE CHANGE**

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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Area of Critical Drainage
  - 1 in 30 year (3.3% annual probability)
  - 1 in 100 year (1% annual probability)
  - 1 in 1000 year (0.1% annual probability)

- NOTES**
1. This map shows the predicted likelihood of surface water flooding based on the Environment Agency's updated Flood Map from Surface Water data, which may be subject to further analysis in the future.
  2. The Risk from Surface Water Flooding is divided into three categories:
    - Low: each year the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%)
    - Medium: each year the chance of flooding is between 1 in 100 (1%) and 1 in 30 (3.3%)
    - High: each year, the chance of flooding is equal to or greater than 1 in 30 (3.3%)
  3. The potential impact of surface water flooding can vary according to the depth of water and velocity (speed and direction of flow).
  4. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding can be difficult to predict as it is hard to forecast exactly where or how much rain will fall in any storm.
  5. This map is intended to provide strategic overview of susceptibility to surface water flooding and should not be used to assess flood risk for individual properties.
  6. Area of Critical Drainage are based upon the Local Risk Management Strategy.
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Client:

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

**RISK OF FLOODING FROM SURFACE WATER**

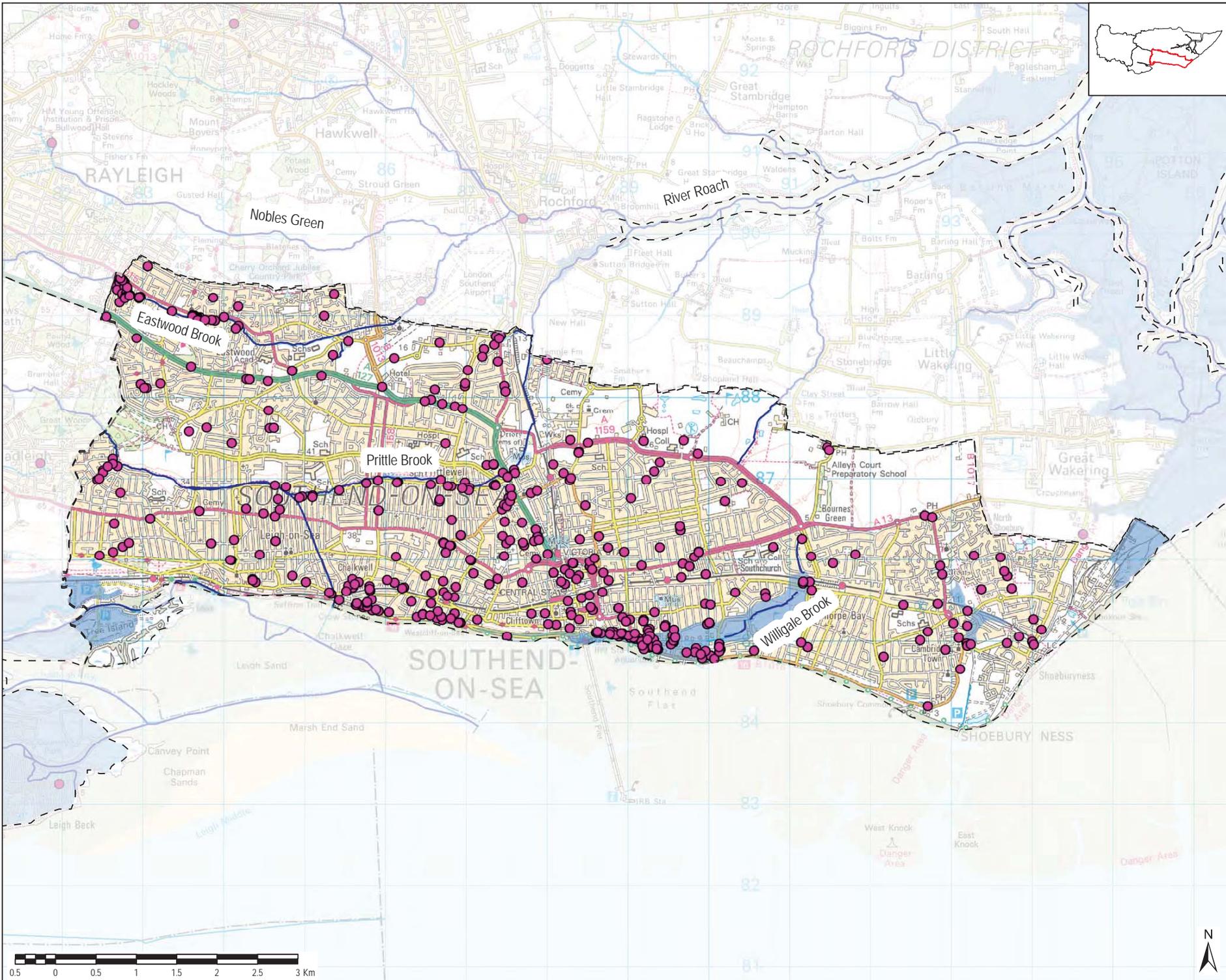
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Drawing Number: **FIGURE 7.2** Rev: **1**

File Name: lba-wp-0031-0700 - Water/Water Main4 - PROJECT: S60516/6532482 - South Essex SFRA/UCS/Project Files/UK/SFRA/Figure 4-2.3.2.6.2.7.2 Risk of Flooding from Surface Water.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert
- Historic Flood Map
- Record of Flooding (Unknown Source)

**NOTES**

1. Flood records do not refer to internal property flooding, rather area that have been susceptible to flooding in the past. Further detail is included in Appendix A of this report.

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Client:

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **HISTORIC FLOOD MAP**

Drawn KLD	Checked JW	Approved CP	Date 12/04/2018
AECOM Internal Project No. 60532482		Scale @ A3 1:43,000	

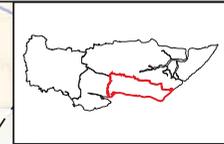
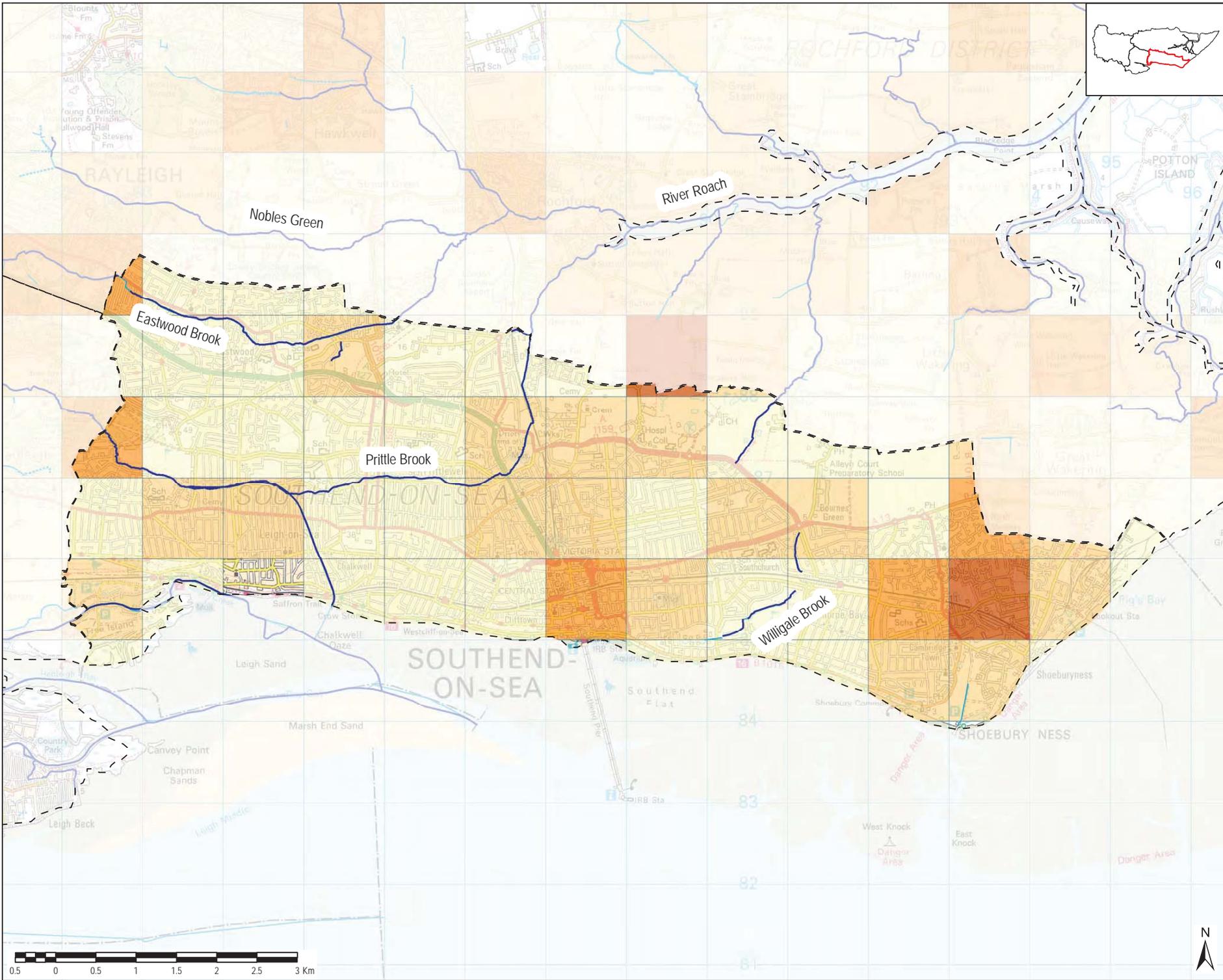
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Drawing Number: **FIGURE 7.3** Rev: **1**

File Name: Iba-wp-00317700 - Water Water Now4 - PROJECTS\SFRM40\GIS\Project Files\MXD\Figure 4.3.5.1.3.1 Historic Flood Map.mxd

File Name: \\ba-wp-0031700 - Water\Water New4 - PROJECT\S653482\S653482 - South Essex SFRA\Map GIS\Project\Final\Fig4.4.5.4.1.7 - Areas Susceptible to Ground Water Flooding.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**Areas Susceptible to Groundwater Flooding - Level of Risk**

- $\geq 75\%$
- $\geq 50\% < 75\%$
- $\geq 25\% < 50\%$
- $< 25\%$

**NOTES**

1. This map is intended to provide a strategic overview of susceptibility to groundwater flooding and should not be used to assess flood risk for individual properties.
2. Absence of values for any grid square means that no part of that square is identified as being susceptible to groundwater emergence.

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**castlepoint**

**Rochford District Council**

**southend on-sea**  
BOROUGH COUNCIL

Project Title: **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title: **AREAS SUSCEPTIBLE TO GROUNDWATER FLOODING**

Drawn KLD	Checked JW	Approved CP	Date 11/04/2018
AECOM Internal Project No. 60532482		Scale @ A3 1:43,000	

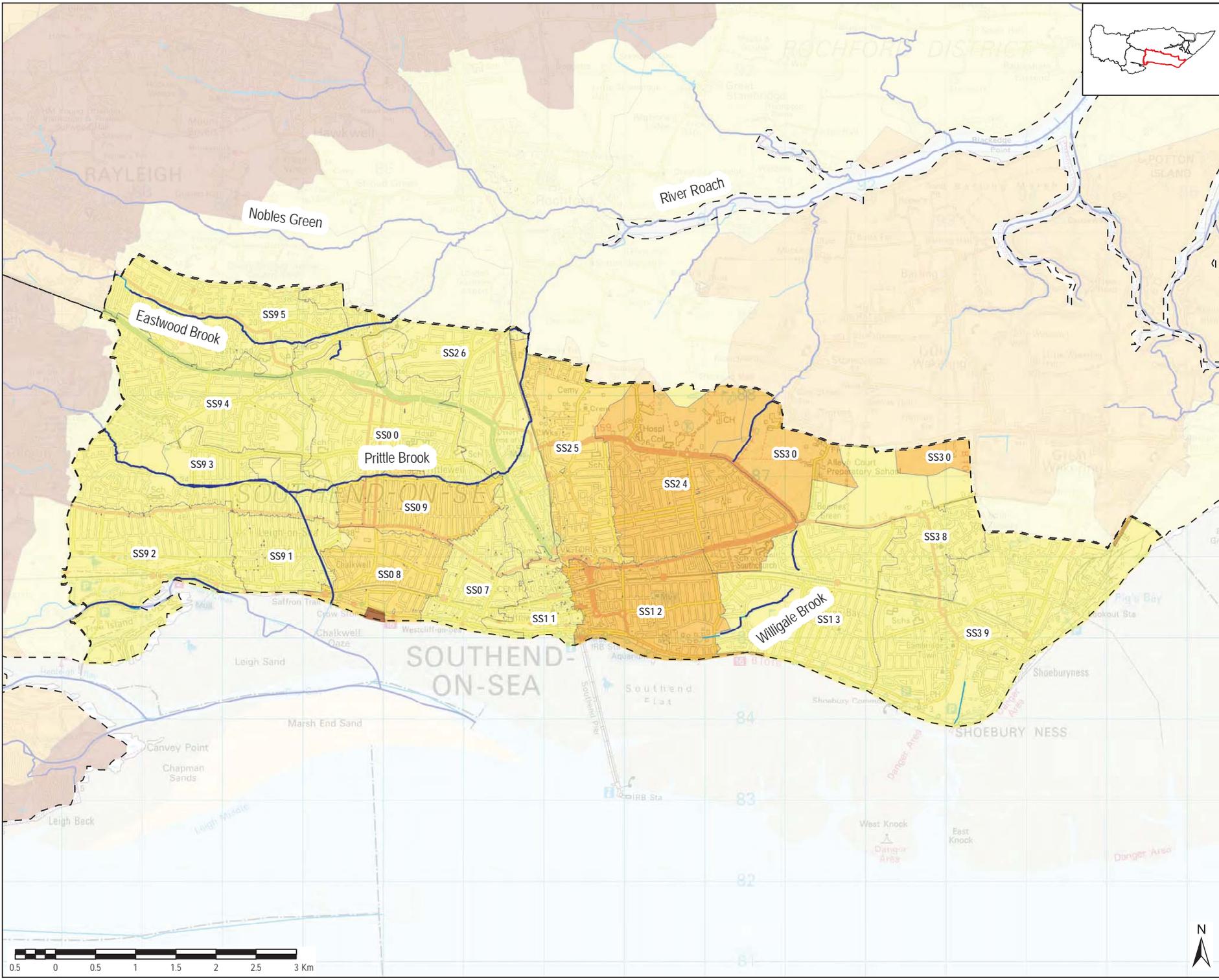
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Drawing Number: **FIGURE 7.4**      Rev: **1**

File Name: \\ba-wp-0031700 - Water\Water New4 - PROJECT\S6531652482 - South Essex SFRA\Map\GIS\Project\Final\Map\Fig07\_4\_S5\_6\_5\_7\_5\_Sewer Flooding.mxd



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**LEGEND**

- Council Boundary
- Main River
- Ordinary Watercourse
- Culvert

**DG5: Flooding Incidents by Postcode**

- 0
- 1
- 2 - 3
- 4 - 5
- 6 - 10

**NOTES**

1. This map is intended to provide a strategic overview of historic sewer flooding and should not be used to assess flood risk for individual properties.

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Project Title:  
**SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title:  
**SEWER FLOODING**

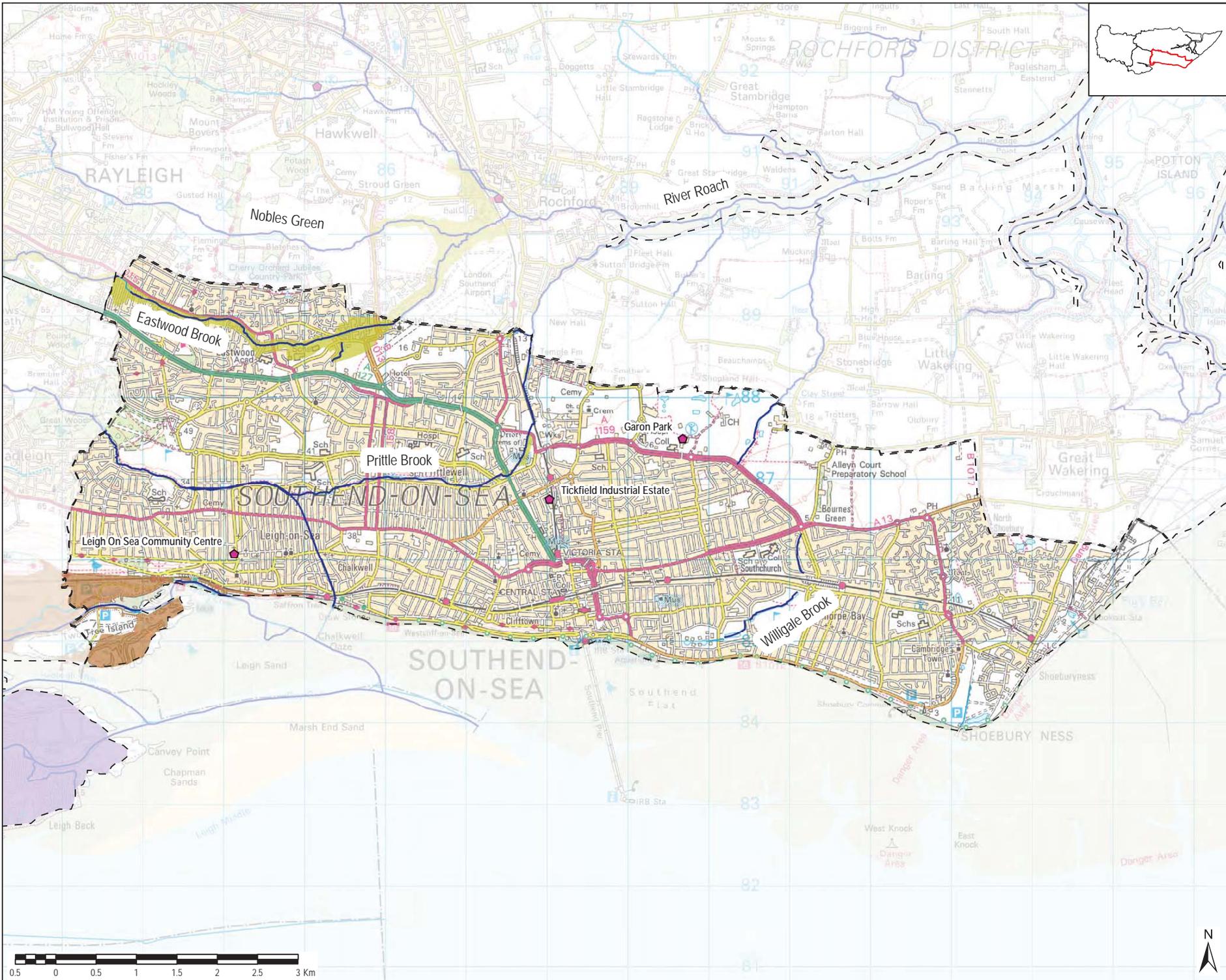
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Drawing Number: **FIGURE 7.5**

Rev: **1**



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- LEGEND**
- Council Boundary
  - Main River
  - Ordinary Watercourse
  - Culvert
  - Emergency Rest Centre
- Flood Warning Area**
- Canvey Island North
  - Canvey Island South
  - Eastwood Brook from downstream of Rayleigh Weir and the Prittlewell Brook to Southend Airport
  - Leigh On Sea frontage from Chalkwell to Hadleigh Marshes including Two tree Island

- NOTES**
1. The Environment Agency provides a free flood warning service for many areas at risk of flooding from rivers and sea. This can provide advance notice of flooding and provide time to prepare.
  2. The Environment Agency issues flood warnings to homes and businesses when flooding is expected. Upon receipt of a warning, residents should take immediate action.
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Project Title **SOUTH ESSEX LEVEL 1 SFRA**

Drawing Title **FLOOD WARNING AREAS**

Drawn KLD	Checked JW	Approved CP	Date 11/04/2018
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Drawing Number **FIGURE 7.6** Rev **1**

File Name: \\ba-wp-0031700 - Water\Water New4 - PROJECT\S6532482 - South Essex SFRA\A3 - GIS\Project\Final\Map\Fig 7.6 Flood Warning Areas.mxd