

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 14th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Bolton BC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous Greater Manchester 2008 SFRA using the most up-to-date data available. The following methodology note explains how the 2008 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

NOTE TO FILE

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2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2008 Functional Floodplain

Text taken from the 2008 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)*.” For the purposes of the Bolton Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event (i.e. relatively frequent inundation expected, on average once every 20 years).

Within the Borough of Bolton, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Bolton was only identified along the rivers within Bolton in the 2008 Level 1 SFRA.

NOTE TO FILE

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4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2008 functional floodplain

- Functional Floodplain from previous SFRA (2008)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – none applicable
- EA Historic Flood Map (HFM) – present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2008 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2008 functional floodplain:
 - The 2016 River Croal Model Update 5% undefended AEP outline was used to update the functional floodplain for parts of the River Croal (See Table 1 for locations)
 - The 2011 Eagley Brook Model Update 5% undefended AEP outline was used to update the functional floodplain for Eagley Brook and Delph Brook (see Table 1 for locations)
 - The 2011 Dean Brook Model Study undefended 5% AEP outline was used to update the functional floodplain for parts of Dean Brook and Raveden Brook (see Table 1 for locations)
 - The 2011 Riding Gate Brook Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include this river (see Table 1 for locations)
 - The 2010 Will Hill Doe Hey Brook Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include this river (see Table 1 for locations)
 - The 2010 Captains Clough Brook Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include this river (see Table 1 for locations)
 - The 2010 Dunsar Brook Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include this river (see Table 1 for locations)
 - The 2010 Bessy Brook Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include the model outlines (see Table 1 for locations)
 - The 2009 Lees Bridge Model Study undefended 4% AEP outline was used to update the functional floodplain as the original 2008 functional floodplain did not include the model outlines (see Table 1 for locations)
- The HFM was added as there were some areas applicable in the area of Bolton
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain.
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

NOTE TO FILE

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 Subject Functional Floodplain Update for Bolton BC



Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
River Croal/ Middle Brook	North of Burden to the East Fernhill Gate	River Croal Model Update (2016)
Eagley Brook/ Delph Brook	West of Egerton to the South of Eagley	Eagley Brook Model Update (2011)
Dean Brook/ Raveden Brook	West of Sharples to the East of Smithills	Dean Brook Model Update (2011)
Riding Gate Brook	East of Bradshaw to the West of Hardwood Lee	Riding Gate Brook Model Update (2011)
Will Hill Brook/ Doe Hey Brook	North of Farnworth to south of Daubhill	Will Hill Doe Hey Brook Model Update (2011)
Captains Clough Brook	West of Cope Bank to East of Delph Hill	Captains Clough Brook Model Update (2010)
Dunscar Brook	South of Egerton to the West of Dunscar	Dunscar Brook Model Update (2010)
Bessy Brook	North of Lostock Junction to High Rid Reservoir south West of Delph Hill	Bessy Brook Model Update (2010)
Lees Bridge	Adjacent to the Waters Meeting Road North of Back o' th' Bank	Lees Bridge Model Update (2009)
River Irwel	South of Farnworth and North of Kearsley	Historic Flood Map (2017)
River Croal	East of Burden and West of Little Lever	Historic Flood Map (2017)
Pearl Brook	Located within Hornwhich	Historic Flood Map (2017)
Dean Brook	South of Smithills and North of Doffcocker	Historic Flood Map (2017)

Table 1 above shows the latest available model flood outlines used to update the previous 2008 functional floodplain. All other watercourses within Bolton have not been updated and use the previous functional floodplain.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

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Subject Functional Floodplain Update for Bury BC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'BRO' Bury, Rochdale and Oldham 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code 2017s6287
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identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)*.” For the purposes of the Bury Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Borough of Bury, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Bury was only identified along the rivers within Bury in the 2009 Level 1 SFRA.

NOTE TO FILE

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4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain

- Functional Floodplain from previous SFRA (2009)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – none applicable
- EA Historic Flood Map (HFM) – present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2009 functional floodplain:
 - The 2016 Crow Trees Farm Brook Model Update 5% undefended AEP outline was used to update the functional floodplain for parts of the Crow Trees Farm Brook (See Table 1 for locations)
 - The 2011 Dumers Lane Model Update 5% undefended AEP outline was used to update the functional floodplain for parts of River Irwell (see Table 1 for locations)
- The HFM was added as there were some areas applicable in the area of Bury
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Crow Trees Farm Brook	South West of Redvales to East of Radcliffe	Crow Trees Farm Brook Model Update (2016)
River Irwell	South East of Redvales to North of Barlow Fold	Dumers Lane Model Update (2011)
Holcombe Brook	Located within Holcombe Brook	Historic Flood Map (2017)

Table 1 above shows the latest available model flood outlines used to update the previous 2009 functional floodplain. All other watercourses within Bury have not been updated and use the previous functional floodplain.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

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1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'MST' Manchester, Salford and Trafford 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 explains that local planning authorities should identify areas of

NOTE TO FILE

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functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing defences and infrastructure or solid buildings, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which "water has to flow or be stored in times of flood". The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that "SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)." For the purposes of the Manchester City Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the City of Manchester, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Manchester was only identified along the rivers within Manchester in the 2009 Level 1 SFRA.

NOTE TO FILE

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4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain

- Functional Floodplain from previous SFRA (2009)
- EA Flood Storage Areas (FSA) – present
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Areas Benefitting from Defences (ABD) – none included – however one located West of Chorlton-cum-hardy where Chorlton Platt Gore model is present.
- EA Historic Flood Map (HFM) – present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

Commented [CL1]: Query for EA

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2009 functional floodplain:
 - The 2012 Chorlton Platt Gore Model Update 4% defended AEP outline was used to update the functional floodplain for parts of the Platt Brook and Gore Brook (See Table 1 for locations)
 - The 2012 Upper Mersey Model Update 5% defended AEP outline was used to update the functional floodplain for parts of River Mersey and Chorlton Brook (see Table 1 for locations)
 - The 2011 Medlock at Tauton Modelling update 4% undefended AEP outline was used to update the functional floodplain for parts of Medlock at Tauton Brook (see Table 1 for locations)
 - The 2009 Gateley Brook Model Study undefended 5% AEP outline was used to update the functional floodplain for parts of Gateley Brook (see Table 1 for locations)
- The HFM was added in some areas as the data was applicable.
- There is one FSA located within Manchester, this data was included into the functional floodplain alongside the Upper Mersey Model update.
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain.
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Platt Brook and Gore Brook	West of Chorlton-cum-hardy to the East of Rusholme	Chorlton Platt Gore Model Update (2012)
River Mersey/ Chorlton Brook	West of Chorlton-cum-hardy to East Didsbury	Upper Mersey Model Update (2012)
River Medlock	West of Manchester City Centre to Bradford	Medlock at Tauton (2011)
Gateley Brook	North of Sharston East of Longly Lane	Gateley Brook Model Update (2009)
Bridgewater Canal	Located within Manchester City Centre	Historic Flood Map (2017)
River Mersey	Located in East Didsbury	Flood Storage Area (2017)

NOTE TO FILE

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Table 1 above shows the latest available model flood outlines used to update the previous 2009 functional floodplain. For watercourses where updated MFOs were unavailable, the 2009 functional floodplain outline is still in place.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

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1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'BRO' Bury, Rochdale and Oldham 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

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Flood Zone	Definition
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Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

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identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

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The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes.*” For the purposes of the Oldham Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Borough of Oldham, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Oldham was only identified along the rivers within Oldham in the 2009 Level 1 SFRA.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 14th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Oldham BC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain

- Functional Floodplain from previous SFRA (2009)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – none applicable
- EA Historic Flood Map (HFM) – none present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were consulted to update the 2009 functional floodplain:
 - The 2012 Snipe Clough Model Update 5% undefended AEP outline was used to update the functional floodplain for parts of the Snipe Clough as the latest Modelling and EA Flood Zone 3 included the Lake (See Table 1 for locations)
 - The 2011 Pencil Brook Model Update 5% undefended AEP outline was used to update the functional floodplain for Pencil Brook as the original 2009 functional floodplain did not include this river (see Table 1 for locations)
 - The 2011 Wood and Thornley Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Thornley Brook and Wood Brook (see Table 1 for locations)
 - The 2010 River Irk Model Study undefended 5% AEP outline was used to update the functional floodplain for parts of River Irk (see Table 1 for locations)
- The HFM was not added as there were none found in the area of Oldham
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain
- A geometry check was carried out on the final draft outline to ensure geometric correctness

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Snipe Clough	East of Primrose Bank adjacent to Kings Road	Snipe Clough Model Update (2012)
Pencil Brook	North Lower Rushcroft to East of Wood End	Pencil Brook Model Update (2011)
Wood Brook	North West of Grotton to the North of Springhead	Wood and Thornley Brook Model update (2011)
Thornley Brook	East of Leesfield to the East of Grotton	Wood and Thornley Brook Model Update (2011)
River Irk	South West of Buckley Wood to South West Low Crompton	River Irk Model Update (2010)

Table 1 shows the latest available model flood outlines used to update the previous 2009 functional

NOTE TO FILE

JBA Project Code	2017s6287
Contract	Greater Manchester Level 1 SFRA
Lead Client	GMCA
Day, Date and Time	14th November 2017
Author	Charlotte Lloyd-Randall
Reviewer	Mike Williamson
Subject	Functional Floodplain Update for Oldham BC



floodplain. All other watercourses within Oldham have not been updated and use the previous functional floodplain.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 17th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Rochdale BC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'BRO' Bury, Rochdale and Oldham 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code	2017s6287
Contract	Greater Manchester Level 1 SFRA
Lead Client	GMCA
Day, Date and Time	17th November 2017
Author	Charlotte Lloyd-Randall
Reviewer	Mike Williamson
Subject	Functional Floodplain Update for Rochdale BC



identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes.*” For the purposes of the Rochdale Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Borough of Rochdale, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Rochdale was only identified along the rivers within Rochdale in the 2009 Level 1 SFRA.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 17th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Rochdale BC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain:

- Functional Floodplain from previous SFRA (2009)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – none applicable
- EA Historic Flood Map (HFM) – included
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2009 functional floodplain:
 - The 2015 Buckley Brook Model Update 4% defended AEP outline was used to update the functional floodplain for parts of the Buckley Brook (see Table 1 for locations)
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain.
- HFM was included at Gale.
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Buckley Brook	North of Buckley to West of Newbold Brow	Buckley Brook Model Update (2015)
Town House Brook	Located within Gale	Historic Flood Map (2017)
River Roch	Located within Gale	Historic Flood Map (2017)

Table 1 above shows the latest available model flood outlines used to update the previous 2009 functional floodplain. For watercourses where updated MFOs were unavailable, the 2009 functional floodplain outline is still in place. The Millers Brook model was reviewed as part of the functional floodplain update however due to joint probability flooding with the Roch the Millers Brook model is not significant and therefore was not used.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Salford BC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'MST' Manchester, Salford and Trafford 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Salford BC



identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing defences and infrastructure or solid buildings, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which "water has to flow or be stored in times of flood". The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that "SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)." For the purposes of the Salford Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event (i.e. relatively frequent inundation expected, on average once every 20 years).

Within the Borough of Salford, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Salford was only identified along the rivers within Salford in the 2009 Level 1 SFRA.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Salford BC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain

- Functional Floodplain from previous SFRA (2009)
- EA Flood Storage Areas (FSA) – present
- EA Areas Benefitting from Defences (ABD) – present
- EA Historic Flood Map (HFM) – none included – however one large area located South of Pendlebury to Lower Broughton which may be applicable on a couple of open areas.
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

Commented [CL1]: Query for the EA

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2009 functional floodplain:
 - The 2017 Lower Irwell Model Update 4% defended AEP outline was used to update the functional floodplain for parts of the River Irwell (See Table 1 for locations)
- The HFM was not added as there were none applicable in the area of Salford
- There is one FSA located within Salford this data was included to update the functional floodplain
- The ABD layer was integrated, as it was sufficiently up to date to aid the removal of areas that coincide with the ABD. The ABD was used to erase parts of the 2009 functional floodplain located in Westwood Park.
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain.
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
River Irwell	North of Clifton Junction to the East of Wallness	Lower Irwell Model Update (2017)
River Irwell	West of higher Broughton	Flood Storage Area (2017)

Table 1 above shows the latest model flood outlines used to update the previous 2009 functional floodplain. For watercourses where updated MFOs were unavailable, the 2009 functional floodplain outline is still in place.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Stockport MBC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous Greater Manchester 2008 SFRA using the most up-to-date data available. The following methodology note explains how the 2008 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Stockport MBC



identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2008 Functional Floodplain

Text taken from the 2008 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)*.” For the purposes of the Stockport Metropolitan Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Metropolitan Borough of Stockport, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Stockport was only identified along the rivers within Stockport in the 2008 Level 1 SFRA.

NOTE TO FILE



JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Stockport MBC

4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2008 functional floodplain

- Functional Floodplain from previous SFRA (2008)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – none applicable
- EA Historic Flood Map (HFM) – none applicable
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2008 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017).
- The following MFOs were used to update the 2008 functional floodplain:
 - The 2016 Lower Goyt Model Update 5% undefended AEP outline was used to update the functional floodplain for parts of the Lower Goyt (See Table 1 for locations)
 - The 2012 Upper Mersey Model Update 5% undefended AEP outline was used to update the functional floodplain for River Mersey, River Tame and River Goyt (see Table 1 for locations)
 - The 2012 Hazel Grove Brook and Poise Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Hazel Grove Brook and Poise Brook (see Table 1 for locations)
 - The 2012 Cheadle Model Study undefended 5% AEP outline was used to update the functional floodplain for parts of an unknown River (see Table 1 for locations)
 - The 2012 River Goyt at Marple Bridge Model Study undefended 0.1% AEP outline was used to update the functional floodplain for parts of River Goyt at Marple Bridge (see Table 1 for locations). This model was used as the EA Flood maps illustrate a similar outline to the 2012 model, the area is undefended and the 2012 Royt Goyt at Marple Bridge is latest model available in this area.
 - The 2009 Hempsshaw Brook Model Update 5% undefended AEP outline was used to update the functional floodplain as this model was no included in the 2008 functional floodplain. (see Table 1 for locations)
 - The 2009 Gateley Brook Model Update 5% AEP outline was used to update the functional floodplain for parts of Gateley Brook (see Table 1 for locations)
- The HFM was not added as there were none applicable in the area of Stockport
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
River Goyt	East of Portwood to the west of Cote Green	Lower Goyt Model Update (2016)
River Mersey/ River Tame/ River Goyt	South of Heaton Mersey to Portwood	Upper Mersey Model Update (2012)

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Stockport MBC



Watercourse	Extent	Data Source
Hazel Grove Brook and Poise Brook	East of Offerton to the South of Torkington	Hazel Grove Brook and Poise Brook Model Update (2012)
Unknown	West of Cheadle to the West of Cheadle Hulme	River Cheadle Model Update (2012)
River Goyt	North of Marple and West of Cote Green	River Goyt at Marple Bridge Model Update (2012)
Hempshaw Brook	Centre of Stockport West of St Mary's Way (B5465)	Hempshaw Brook Model Update (2009)
Gateley Brook	North of Gatley	Gateley Brook Model Update (2009)

Table 1 above shows the latest available model flood outlines used to update the previous 2008 functional floodplain. For watercourses where updated MFOs were unavailable, the 2008 functional floodplain outline is still in place.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Tameside MBC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous Greater Manchester 2008 SFRA using the most up-to-date data available. The following methodology note explains how the 2008 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code	2017s6287
Contract	Greater Manchester Level 1 SFRA
Lead Client	GMCA
Day, Date and Time	15 th November 2017
Author	Charlotte Lloyd-Randall
Reviewer	Mike Williamson
Subject	Functional Floodplain Update for Tameside MBC



identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2008 Functional Floodplain

Text taken from the 2008 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)*.” For the purposes of the Tameside Metropolitan Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Metropolitan Borough of Tameside, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Tameside was only identified along the rivers within Tameside in the 2008 Level 1 SFRA.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Tameside MBC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2008 functional floodplain

- Functional Floodplain from previous SFRA (2008)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD) – present
- EA Historic Flood Map (HFM) – none present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2008 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017). Where the 2008 functional floodplain exceeds Flood Zone 3 the functional floodplain was erased and updated with Flood Zone 3.
- The following MFOs were used to update the 2008 functional floodplain:
 - The 2014 Taunton Brook Model Update 5% undefended AEP outline was used to update the functional floodplain for Taunton Brook as the original 2008 functional floodplain did not include this river (see Table 1 for locations)
 - The 2012 Micklehurst Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Micklehurst Brook (see Table 1 for locations)
 - The 2011 Glossop Brook & Tribs Model Study defended 5% AEP outline was used to update the functional floodplain for parts of Glossop Brook & Tribs and River Etherow (see Table 1 for locations)
- The HFM was not added as there were none found in the area of Tameside
- The ABD layer was integrated, as it was sufficiently up to date to aid the removal of areas that coincide with the ABD. The ABD was used to erase parts of the 2008 functional floodplain located in Dukinfield.
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Tauton Brook	West Limehurst to East Limehurst	Tauton Brook Model Update (2014)
Glossop Brook & Tribs/ River Etherow	Located East Mottram in Longdendale	Glossop Brook & Tribs Model Update (2011)
River Tame	East Denton to West Hyde	Flood Zone 3 August (2017)

Table 1 above shows the latest available model flood outlines used to update the previous 2008 functional floodplain. Micklehurst Brook model flood outline was not used for the functional floodplain update due to the outline being located all within the bank. For watercourses where updated MFOs were unavailable, the 2008 functional floodplain outline is still in place.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Trafford BC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 'MST' Manchester, Salford and Trafford 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 explains that local planning authorities should identify areas of

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Trafford BC



functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing defences and infrastructure or solid buildings, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 Functional Floodplain

Text taken from the 2009 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which "water has to flow or be stored in times of flood". The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that "SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)." For the purposes of the Trafford Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 4% AEP (25 year) flood event (i.e. relatively frequent inundation expected, on average once every 25 years).

Within the Borough of Trafford, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Trafford was only identified along the rivers within Trafford in the 2009 Level 1 SFRA.

NOTE TO FILE

JBA Project Code 2017s6287
 Contract Greater Manchester Level 1 SFRA
 Lead Client GMCA
 Day, Date and Time 15th November 2017
 Author Charlotte Lloyd-Randall
 Reviewer Mike Williamson
 Subject Functional Floodplain Update for Trafford BC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2009 functional floodplain

- Functional Floodplain from previous SFRA (2009)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – present
- EA Areas Benefitting from Defences (ABD) – present
- EA Historic Flood Map (HFM) – none present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2009 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017). Where the 2009 functional floodplain exceeds Flood Zone 3 the functional floodplain was erased and updated with Flood Zone 3.
- The following MFOs were used to update the 2009 functional floodplain:
 - The 2012 Upper Mersey Model Update 5% defended AEP outline was used to update the functional floodplain for parts of the River Mersey, Barrow Brook, Ousel Brook, Old Eea Brook (See Table 1 for locations)
 - The 2012 Carrs Ditch Model Update 5% undefended AEP outline was used to update the functional floodplain for Carrs Ditch as the original 2009 functional floodplain did not include this river (see Table 1 for locations)
 - The 2012 Chorlton Platt Gore Model Update 4% defended AEP outline was used to update the functional floodplain for parts of Chorlton Platt Gore (see Table 1 for locations)
- The HFM was not added as there were none found in the area of Trafford.
- The ABD layer was integrated, as it was sufficiently up to date to aid the removal of areas that coincide with the ABD. The ABD was used to erase parts of the 2009 functional floodplain located in Broadheath, East Broadheath and South Stretford.
- There are two FSA located within Trafford, one FSA was added to the functional floodplain, however the other was not due to a higher precedence in comparison to the Upper Mersey model.
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain.
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Commented [MW1]: Doesn't reflect ABD, Query with EA

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
River Mersey/ Barrow Brook/ Ousel Brook/ Old Eea Brook/	North West of Carrington to the south East of Stretford	Upper Mersey Model Update (2012)
Carrs Ditch	South of Irlam and to the West of Flixton	Carrs Ditch Model Update (2012)
Chorlton Platt Gore	East of Stretford and to the North East of Sale	Chorlton Platt Gore Model Update (2012)
Timperley Brook	East of Altrincham and North of Hale	Flood Zone 3 August (2017)
Woodheys Clough	East of Broadheath to the West of Partington	Flood Zone 3 August (2017)

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 15th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Trafford BC



Watercourse	Extent	Data Source
Baguley Brook	East of Timperley to the North of Timperley	Flood Zone 3 August (2017)
Bridgewater Canal	North of Altrincham	Flood Storage Area (2017)

Table 1 above shows the latest available model flood outlines used to update the previous 2009 functional floodplain. The 2017 EA Flood Zone 3a outline was used rather than the 2009 functional floodplain outlines because these areas were based on the Flood Zone 3a proxy which has been updated since. All other watercourses within Trafford have not been updated and use the previous functional floodplain.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 17th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Wigan MBC



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous Greater Manchester 2008 SFRA using the most up-to-date data available. The following methodology note explains how the 2008 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional Floodplain Definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 of the FRCC-PPG explains that local planning authorities should

NOTE TO FILE

JBA Project Code 2017s6287
Contract Greater Manchester Level 1 SFRA
Lead Client GMCA
Day, Date and Time 17th November 2017
Author Charlotte Lloyd-Randall
Reviewer Mike Williamson
Subject Functional Floodplain Update for Wigan MBC



identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing flood defence infrastructure, buildings and major transport infrastructure, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2008 Functional Floodplain

Text taken from the 2008 Level 1 SFRA Update:

Zone 3b Functional Floodplain is defined as those areas in which “*water has to flow or be stored in times of flood*”. The definition of functional floodplain remains somewhat open to subjective interpretation. PPS25 states that “*SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)*.” For the purposes of the Wigan Metropolitan Borough Council SFRA, Zone 3b has been defined in the following manner:

- land where the flow of flood water is not prevented by flood defences or by permanent buildings or other solid barriers from inundation during times of flood;
- land which provides a function of flood conveyance (i.e. free flow) or flood storage, either through natural processes, or by design (e.g. washlands and flood storage areas);
- land subject to flooding in the 5% AEP (20 year) flood event and 4% AEP (25 year) (i.e. relatively frequent inundation expected, on average once every 20/25 years).

Within the Metropolitan Borough of Wigan, this encompasses primarily those low lying areas neighbouring the primary watercourses. Any development within these areas is likely to measurably impact upon the existing flooding regime, increasing the severity and frequency of flooding elsewhere.

Functional floodplain in Wigan was only identified along the rivers within Wigan in the 2008 Level 1 SFRA.

NOTE TO FILE

JBA Project Code	2017s6287
Contract	Greater Manchester Level 1 SFRA
Lead Client	GMCA
Day, Date and Time	17 th November 2017
Author	Charlotte Lloyd-Randall
Reviewer	Mike Williamson
Subject	Functional Floodplain Update for Wigan MBC



4 Functional Floodplain Delineation

The following data sets have been interrogated to update the 2008 functional floodplain

- Functional Floodplain from previous SFRA (2008)
- EA modelled flood outlines (MFO) from latest available modelling studies. Defended scenario outlines were used where available. If unavailable, undefended scenario outlines were used
- EA Flood Storage Areas (FSA) – none applicable
- EA Areas Benefitting from Defences (ABD) – present
- EA Historic Flood Map (HFM) – present
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas and transport infrastructure from functional floodplain)

4.1 GIS Methodology

- The 2008 functional floodplain provided a starting point and was compared to the current Flood Zone 3 of the Flood Map for Planning (version August 2017). Where the 2008 functional floodplain exceeds Flood Zone 3 the functional floodplain was erased and updated with Flood Zone 3.
- The following MFOs were used to update the 2008 functional floodplain:
 - The 2016 Leigh East Model Update 5% defended AEP outline was used to update the functional floodplain for Leigh East, PenLeach Brook, Atherton Lake Brook, Bedford Brook, Red Waters, Hindsford Brook and Atherton Brook (see Table 1 for locations).
 - The 2014 Clarington Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Clarington Brook (see Table 1 for locations)
 - The 2014 Astley Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Astley Brook, Ellenor Brook and Honksford Brook (see Table 1 for locations)
 - The 2014 Spinny Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Spinny Brook (see Table 1 for locations)
 - The 2014 Jacks Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Jacks Brook (see Table 1 for locations)
 - The 2012 Douglas SFRM Mapping and Modelling Study defended 4% AEP outline was used to update the functional floodplain for parts of River Douglas, Poolstock Brook and Smithy Brook (see Table 1 for locations)
 - The 2011 Bag Lane Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Bag Lane Brook and Atherton Brook (see Table 1 for locations)
 - The 2010 Ambers Wood Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Ambers Wood Brook and Ince Brook (see Table 1 for locations)
 - The 2010 Borsdane Brook Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Borsdane Brook (see Table 1 for locations)
 - The 2010 Firewood Grove Tributary Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Firewood Grove Tributary (see Table 1 for locations)
 - The 2010 Crow Wood Avenue Mapping and Modelling Study undefended 5% AEP outline was used to update the functional floodplain for parts of Crow Wood Avenue (see Table 1 for locations)
 - The 2010 Cooling Lane Model Study defended 5% AEP outline was used to update the functional floodplain for parts of Cooling Lane (see Table 1 for locations)
- The HFM was added as there were many areas found within Wigan
- The ABD layer was integrated, as it was sufficiently up to date to aid the removal of areas that coincide with the ABD. The ABD was used to erase parts of the 2008 functional floodplain located in Crooke, Wallgate

NOTE TO FILE

JBA Project Code 2017s6287
 Contract Greater Manchester Level 1 SFRA
 Lead Client GMCA
 Day, Date and Time 17th November 2017
 Author Charlotte Lloyd-Randall
 Reviewer Mike Williamson
 Subject Functional Floodplain Update for Wigan MBC



and Lately Common.

- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain
- A geometry check was carried out on the final draft outline to ensure geometric correctness.

Table 1 Functional floodplain data sources

Watercourse	Extent	Data Source
Leigh East/ PenLeach Brook/ Atherton Lake Brook/ Bedford Brook/ Red Waters/ Hindsford Brook/ Atherton Brook	West Atherton to South higher Folds	Leigh East (2016)
Clarington Brook	South New Springs to Rose Bridge	Clarington Brook (2014)
Astley Brook/ Ellenor Brook/ Honksford Brook	South Blackmoor to North Mosley Common	Astley Brook (2014)
Spinny Brook	South East Spring Bank	Spinny Brook (2014)
Jacks Brook	West of Ashton-In-Makerfield to West Goldborne	Jacks Brook (2014)
River Douglas/ Poolstock Brook/ Smithy Brook/	South West Shevington to Worthington	Douglas SFRM (2012)
Bag Lane Brook/ Atherton Brook	West Atherton	Bag Lane Brook (2011)
Ambers Wood Brook/ Ince Brook	East Higher Ince to West Hindley	Ambers Wood Brook (2010)
Borsdane Brook	North of Hindley to the centre of Hindley	Borsdane Brook (2010)
Firewood Grove Tributary	West of Ashton-In-Makerfield	Firewood Grove Tributary (2010)
Crow Wood Avenue	North East Golborne	Crow Wood Avenue (2010)
Cooling Lane	Located in High Folds	Cooling Lane (2010)
Unknown	Plank Lane	Historic Flood Map (2017)
Scotman's Flash	Hawkley	Historic Flood Map (2017)
Bucklow Brook	North East Standish	Historic Flood Map (2017)
River Douglas	South west Springfield	Historic Flood Map (2017)
Unknown	South West Firs Lane	Flood Zone 3 August (2017)
Pennington Brook	Pennington	Flood Zone 3 August (2017)
The Flash	North Aspull Common	Flood Zone 3 August (2017)
Bedford Brook	Bedford to East Lately Common	Flood Zone 3 August (2017)
Hey brook	South Grampian Bamfurlong	Flood Zone 3 August (2017)
Chanters Brook	South Atherton to West Hindsford	Flood Zone 3 August (2017)
Unknown	Crooke	Flood Zone 3 August (2017)
Old Mill Brook	West Shakerley	Flood Zone 3 August (2017)
Unknown Drain	West Shakerley	Flood Zone 3 August (2017)

NOTE TO FILE

JBA Project Code	2017s6287
Contract	Greater Manchester Level 1 SFRA
Lead Client	GMCA
Day, Date and Time	17 th November 2017
Author	Charlotte Lloyd-Randall
Reviewer	Mike Williamson
Subject	Functional Floodplain Update for Wigan MBC



Table 1 above shows the latest available model flood outlines used to update the previous 2008 functional floodplain. For watercourses where updated MFOs were unavailable, the 2008 functional floodplain outline is still in place.

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.