

NOTE TO FILE

JBA Project Code 2016s5327
Contract Warrington Borough Council Level 1 SFRA
Client Warrington Borough Council
Day, Date and Time 10 May 2017
Author Tasmin Fletcher
Subject Functional Floodplain Delineation



1 Functional Floodplain Definition

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

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency's web site, as indicated in the table below.

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.

1.2 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 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.

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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 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.

2 2011 Functional Floodplain

Text taken from the 2011 Level 1 SFRA:

This SFRA has identified the functional floodplain (Flood Zone 3b), as described in PPS25 and its Practice Guide, using the below criteria.

- Land subject to flooding in modelled 1 in 20 or 1 in 25-year flood events
- Land where water has to flow or be stored in times of flood (e.g. washlands)
- And from these areas, removing
 - land already benefiting from defences or
 - currently developed land where it is difficult to identify its current flood storage function
 - future development sites currently with planning permission
 - major transport infrastructure (e.g. motorways and railways)
 - 'dry islands' defined using the 'size standards' within the Environment Agency SFRM Specification for Flood Risk Mapping

Areas where no modelled 1 in 20/25-year outlines are available a proxy outline has been identified using Flood Zone 3a and edited using the same approach above.

The table below lists all the watercourses with functional floodplain defined in the 2011 SFRA:

Watercourse	Data Source	Confidence*
River Mersey	Warrington Hazard Mapping Study	High
Carr Brook	Warrington Hazard Mapping Study	High
Holcroft Lane Brook	Middle and Lower Mersey S105 Study	Low
Jibcroft Brook	Middle and Lower Mersey S105 Study	Low
Padgate Brook	Warrington Hazard Mapping Study	High
Penketh Brook	Warrington Hazard Mapping Study	High
Phipps Brook	Warrington Hazard Mapping Study	High
River Glaze	Middle and Lower Mersey S105 Study	Low
Sankey Brook (downstream of M62)	Warrington Hazard Mapping Study	High
Sankey Brook (upstream of M62)	Sankey Flood Risk Mapping Study	Medium
Spittle Brook	Warrington Hazard Mapping Study	High
Whittle Brook	Warrington Hazard Mapping Study	High

*Outline confidence is based on modelling confidence and the extent of the outline in relation to the current Flood Zone 3a. Older models will have a lower confidence rating.

3 Functional Floodplain Delineation

Based on the above guidance and definitions provided in the FRCC-PPG, the following models and modelled flood outlines (MFO) were provided by the EA:

Watercourse	Extent	Data Source	Included in Functional Floodplain delineation (Yes/No)
Thelwall Brook	Thelwall Bridge to Manchester Ship Canal	Thelwall Brook Flood Zone update (2007)	No – no 4% or 5% AEP MFO

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Carr Brook	Lowton St Mary's to Glazebury	Middle and Lower Mersey ABD and FZ2 (2008)	No – no 4% or 5% AEP MFO
Lumb Brook	Wood Lane to Manchester Ship Canal	Mersey Estuary Tributaries Flood Risk Mapping (2008)	No – 5% AEP undefended MFO shown to be only within urban areas
Sow Brook	Lymm Dam to Manchester Ship Canal	Local Community Flood Risk Mapping (NW 104) (2012)	Yes – 5% AEP undefended MFO
Bradley Brook	Mag Brook confluence to Lymm Dam	Local Community Flood Risk Mapping (NW 104) (2012)	Yes – 5% AEP undefended MFO
Holcroft Lane Brook	New Hall Farm to confluence with Glaze Brook	Middle and Lower Mersey ABD and FZ2 (2008)	No – no 4% or 5% AEP MFO
Jibcroft Brook	Broseley Lane culvert to confluence with Glaze Brook	Middle and Lower Mersey ABD and FZ2 (2008)	No – no 4% or 5% AEP MFO
Longford Brook/Dallam Brook	Dallam Brook and Longford Brook	Longford Dallam Joint Modelling Project (2010)	No – no 4% or 5% AEP MFO
Lower Walton unnamed watercourse	Hillfoot Farm access road to Manchester Ship Canal	Lower Walton Mapping and Modelling Report (2016)	Yes - 5% AEP undefended MFO
Manchester Ship Canal	Manchester Ship Canal	MSC 4 Gate Scenario (2010)	No – no 4% or 5% AEP MFO
Phipps Brook	Moat House Farm to confluence with Sankey Brook	Middle and Lower Mersey Flood Risk Mapping (NW 003) (2003)	No – no 4% or 5% AEP MFO
Rushgreen Brook	Dyers Close to confluence with Sow Brook	Rushgreen Brook Flood Zone Improvement Study (2011)	No – no 4% or 5% AEP MFO provided. 5% AEP outline in report shown to be only within urban areas
Wellfield Wood unnamed watercourse	Hob Hey Lane to confluence with Jibcroft Brook	Wellfield Wood Flood Zone Improvement Study (2010)	No – no 4% or 5% AEP MFO outline provided. 5% AEP outline assumed to be within urban areas from 1% AEP outline

Further datasets interrogated:

- Functional Floodplain from previous SFRA (2011)
- EA Flood Storage Areas (FSA) – none present
- EA Areas Benefitting from Defences (ABD)
- Historic Flood Map (HFM)
- Urban areas - OSOpenMapLocal_Raster (to remove developed areas from functional floodplain)

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3.1 GIS Methodology

- The 2011 functional floodplain provided the starting point (FZ3b_1.shp) and was compared to the current Flood Zone 3 of the Flood Map for Planning (version February 2017) to ascertain whether the Flood Map may have been updated since the 2011 FZ3b was finalised. No changes were made where the outlines were consistent with each other (i.e. from the same model), however in several locations the current EA FZ3 is different to the 2011 FZ3b outline, indicating that more recent modelling has been carried out since the 2011 FZ3b was produced. It was assumed that for watercourses where models and MFOs provided by the EA were dated prior to 2011, the 2011 FZ3b included the most up to date outlines. For other watercourses, FZ3b was updated as detailed below.
- The 2012 Bradley Brook and Sow Brook undefended 5% outlines were used to update parts of these watercourses (FZ3b_2.shp, see table below for locations)
- The 2016 Lower Walton undefended 5% outline was used to update the unnamed Lower Walton watercourse (FZ3b_3.shp, see table below for locations)
- The sections of the 2011 FZ3b which were identified as proxy areas from the Flood Zone 3 mapping were updated using the current (February 2017) EA Flood Zone 3 (FZ3b_4.shp). The areas of Holcroft and Jibcroft Brooks previously identified using the 2003 Middle and Lower Mersey S105 Study have been redefined using Flood Zone 3 as the previous MFO extended significantly outside of the FZ3 outline. This was deemed appropriate as the previous SFRA had noted low confidence in the outputs from the 2003 study. All other watercourses where there were no MFO have been updated using Flood Zone 3.
- Areas of the HFM were added to areas which were not covered by the MFOs (FZ3b_5.shp).
- The OS Open Data OSOpenMapLocal_Raster dataset was used to identify urban areas, waterbodies and transport infrastructure to be removed from the functional floodplain (FZ3b_6.shp).
- Parts of the functional floodplain which intersected the ABD dataset were removed from the outline (FZ3b_7.shp).

The source of the outline is preserved within the attributes table of the final draft (FZ3b_Draft_2017).

Watercourse	Data Source
River Mersey	Warrington Hazard Mapping Study (2010)
Carr Brook	Middle and Lower Mersey S105 Study (2003)
Holcroft Lane Brook	Flood Zone 3
Jibcroft Brook	Flood Zone 3
Padgate Brook	Warrington Hazard Mapping Study (2010)
Penketh Brook	Warrington Hazard Mapping Study (2010)
Phipps Brook	Warrington Hazard Mapping Study (2010)
River Glaze	Middle and Lower Mersey S105 Study (2003)
Sankey Brook (downstream of M62)	Warrington Hazard Mapping Study (2010)
Sankey Brook (upstream of M62)	Sankey Flood Risk Mapping Study
Spittle Brook	Warrington Hazard Mapping Study (2010)
Whittle Brook	Middle and Lower Mersey S105 Study (2003)
Sow Brook	Local Community Flood Risk Mapping NW 104 (2012)
Bradley Brook	Local Community Flood Risk Mapping NW 104 (2012)
Lower Walton watercourse	Lower Walton Mapping and Modelling Report (2016)
High Walton watercourse	Flood Zone 3

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Watercourse	Data Source
Cockshot Brook	Flood Zone 3
Cinnamon Brook/Black Brook	Flood Zone 3
Red Brook	Flood Zone 3
River Bollin	Flood Zone 3
Phipps Brook	Flood Zone 3
Longford Brook	Warrington Hazard Mapping Study (2010)
Dingle Brook/Lumb Brook (upstream of Wood Lane)	Flood Zone 3

As it is critical that the outline for the functional floodplain is as accurate as possible, the true extent of the functional floodplain outline should be assessed in greater detail during a more detailed study such as a Level 2 SFRA or site-specific FRA.

4 Considerations for the EA, LPA and LLFA

There are some areas of functional floodplain that extends outside of Flood Zone 3 and Flood Zone 2. These are outlines from the 2010 Warrington Hazard Mapping Study and the 2003 Middle and Lower Mersey S105 Study as these were the most up-to-date modelled flood outlines available. There are also areas of FZ3b which extend outside of Flood Zones 2 and 3 on the Lower Walton watercourse. It is assumed that the EA Flood Zone maps have not yet been updated to reflect the recent (2016) modelling used to delineate the functional floodplain there.

5 Datasets Provided to Assist Review

The following ArcGIS datasets are included within the zip file. This will allow for a stepwise review of Flood Zone 3b.

Datasets:

- FZ3b_1.shp
- FZ3b_2.shp
- FZ3b_3.shp
- FZ3b_4.shp
- FZ3b_5.shp
- FZ3b_6.shp
- FZ3b_7.shp
- FZ3b_Draft_2017.shp (draft functional floodplain for review)
- ABD.shp
- HFM.shp
- FZ3.shp
- FZ2.shp
- 2011_FZ3b_merged
- Lower_Walton_5%_undef_MFO_2016.shp
- Sow_Bradley_Brook_5%_undef_MFO_2012.shp
- Lumb_Brook_5%_undef_MFO_2008.shp